The document offers suggestions for developing a Structure of Intellect (SOI) program for gifted elementary students. An introductory chapter covers the definition of SCI, rationale for using the SOI model with gifted students, purpose of the guide, assessment of intellectual ability, preparation of the SOI prescription, classroom activities based on the SOI, organization and teaching strategies, and SOI tasks to be used in remedial reading. Also provided in this initial section are resources which include a list of teachers, references, SOI classification of educational materials, an outline of Trickeron Elementary School lab materials, materials list for the SOI Abilities Workbook, and the SOI Institute list of materials and services. Subsequent chapters are color coded for five areas (cognition, memory, convergent production, divergent production, and evaluation) and usually include an introduction and sections with a glossary of pertinent SOI factor definitions; a list of commercially prepared materials; descriptions of activities; and task cards (which consist of mazes, puzzles, graphs, and other instructional materials). (SBH)
A GUIDE FOR TEACHING
STRUCTURE OF THE INTELLECT
IN THE GIFTED CLASSROOM

Prepared by
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Patricia Ann Markle
for
San Diego City Schools Gifted Programs

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Jacqueline Grohabeck
David P. Hermanson
Ole Kittleson

San Diego City Schools
San Diego, California
1978
Unedited

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INFORMATION CENTER (ERIC)"
PREFACE

The Structure of the Intellect curriculum provides a unique, qualitatively different program which is designed to meet the needs of individual students. It challenges students to perceive, to brainstorm, and to make judgments and decisions. The curriculum encourages students to approach problems in a significantly different way, to be creative, and to enjoy the pleasure of using their minds effectively in the thinking process.

It is hoped that through the use of the materials in this guide the intellectual abilities of the MGM students will be developed and their intellectual potential realized.

Scott C. Gray
Assistant Superintendent
Student Services Division
ACKNOWLEDGMENTS

The writers of this guide gratefully acknowledge the assistance of Dr. Mary Meeker, SOI Institute, El Segundo, California; Dr. Eleanor Manning, Creative Prescriptions Unlimited, East Whittier, California; and Jan Kurtz and Lynn Tuttle, Torrance, California.
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INTRODUCTION

STRUCTURE OF THE INTELLECT: WHAT IS IT?

Structure of the Intellect (SOI) provides a system of testing, prescribing, and teaching based upon the division of intellectual ability into specific factors. J. P. Guilford's model of intelligence (SI) divided intellectual ability into three major dimensions: operations, contents, and products. Later, Dr. Mary Meeker refined Guilford's model into additional dimensions, and she developed an assessment instrument and curriculum for each operations (process) dimension. The factors comprising the Structure of the Intellect, as adapted from descriptions developed by Creative Prescriptions Unlimited at East Whittier, California, are presented below.

**Major Processes** (operations of the mind upon raw materials of information)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>Cognition</td>
<td>The most basic of the operations, it includes discovery, awareness, rediscovery, or recognition of information in various forms; comprehension; and understanding.</td>
</tr>
<tr>
<td>M</td>
<td>Memory</td>
<td>Retention of information in any form. One of the easiest of the operations to train.</td>
</tr>
<tr>
<td>N</td>
<td>Convergent Production</td>
<td>Generation of information from given information where the emphasis is upon reproducing conventionally accepted best answers or outcomes. Most school work is convergent production.</td>
</tr>
<tr>
<td>D</td>
<td>Divergent Production</td>
<td>Generation of information from given information where the emphasis is upon the variety and quality of answers. This operation is closely related to the creative process. Fluency, flexibility, and originality are important components of this operation.</td>
</tr>
<tr>
<td>E</td>
<td>Evaluation</td>
<td>Reaching decisions or making judgments concerning the correctness, suitability, adequacy, and desirability of information in terms of identity, consistency, and goal satisfaction. An area that is frequently overlooked in our schools. Teachers tend to make decisions for students, robbing them of the opportunity to make their own.</td>
</tr>
</tbody>
</table>

**Contents** (general varieties of information)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>Figural Content</td>
<td>Information in a concrete form, visual, auditory, or kinesthetic. A very important component for beginning learners.</td>
</tr>
<tr>
<td>S</td>
<td>Symbolic Content</td>
<td>Information in the form of signs, having no significance in and of themselves, such as letters, numerals, and musical notes. Relates to coding. Math is high in symbolic content.</td>
</tr>
</tbody>
</table>
Semantic Content: Information in the form of meanings to which words commonly become attached; most notable in verbal thinking and reading. Deals with the abstract.

Behavioral Content: Information essentially nonverbal, involved in human interactions where awareness of attitudes, needs, desires, intentions, thought, and so on of other processes is important. (Behavioral content is not a part of this guide.)

Products (results obtained through the intellect's processing of information)

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>U</td>
<td>Units</td>
<td>Deals with the perception of single items such as one figure, symbol, or word.</td>
</tr>
<tr>
<td>C</td>
<td>Classes</td>
<td>Items of information grouped by common properties. Classes are made up of units.</td>
</tr>
<tr>
<td>R</td>
<td>Relations</td>
<td>Recognized connections between units of information based upon variables that apply to them.</td>
</tr>
<tr>
<td>S</td>
<td>Systems</td>
<td>Organized items of information; complexes of interrelated or interacting parts. Sequences in mathematical operations or structure of language represent systems.</td>
</tr>
<tr>
<td>T</td>
<td>Transformations</td>
<td>An abstract area; involves changes in existing or known information, or in its use, requiring the redefinition or modification of information.</td>
</tr>
<tr>
<td>I</td>
<td>Implications</td>
<td>The most abstract of the products area and one that is difficult to convey. Deals with cause and effect; works with known information and its relationship with the unknown.</td>
</tr>
</tbody>
</table>

Charts 1-5 on the following pages present curriculum activities based on the SOI program. The trigrams for each cell (activity) are coded on activity pages for each of the five SOI operations.

The SOI Learning Abilities Test is used to assess the intellectual abilities of each student, and testing results are used to prepare an individual profile and prescription for each student. The profile illustrates the student's strengths and weaknesses, and the prescription states a plan to follow for remediation. The remediation plan pairs a weakness with an area of strength, and curriculum developed for the appropriate factors of SOI is recommended.

In summary, SOI is a program which identifies intellectual strengths and weaknesses and offers the opportunity to utilize teaching strategies and materials with the greatest potential for each student's learning abilities.
WHY SOI FOR GIFTED STUDENTS?

Where are the gifted? A student is identified as "gifted" and is placed in a special class designed to meet his/her special needs, but to what extent are teachers able to determine the strengths and needs of the student? All too often educators assume that because a student does so many things so well there are no weaknesses, for the student is only seen in comparison with others.

Then there is the student who has been identified as gifted, but of whom teachers ask "How is he/she gifted?" when the student barely functions at grade level in academic achievement. How do teachers help these students? What are the true strengths of the student who seemingly does everything so well? When the IQ score seems to be a paradox, how can the student's gifts be discovered? How does a teacher plan a program to meet the needs of a student based on a score measuring IQ?

Through the use of the SOI program, teachers obtain more than an IQ score. A profile on a student identifies the strengths and weaknesses of his intellectual abilities. With an SOI assessment the teacher can determine how the student learns and, as a teacher, more fully understand the seemingly paradoxical student. Further, the prescription provides a plan accompanied by recommended tasks which can be used to improve the student's level of thinking and strengthen problem-solving abilities. Additionally, the SOI Institute has recently developed an SOI Screening Form for Gifted. The form consists of sub-tests from the SOI Learning Abilities Test on which gifted students most consistently score three years or more above grade level. More information may be obtained from the SOI Institute.

If teachers recognize that gifted students have special needs, then teachers must also recognize that these needs can only be met when the students are offered a program that is "qualitatively different" from that being offered in the regular school curriculum. SOI provides such a program. It challenges students to perceive, to brainstorm, and to make sound judgments and decisions. It encourages students to approach problems in a significantly different way, to be creative, and to enjoy the pleasure of using their minds effectively in the thinking process.

The careers our students will undertake and the problems they will encounter when they join the labor force are unknown. Teachers' goals then must be not only to give students the "survival skills" for that world, but to teach them how to use their decision-making skills to solve the problems they will face in the complex societies of the future.

PURPOSE OF THIS GUIDE

SOI was first utilized in the San Diego City Schools Gifted Program as a pilot program at Loma Portal and Lief Ericson Elementary Schools, in 1976-77. Interest in developing other SOI programs has developed as a result of these two programs and the inservice programs provided.

Many questions have arisen regarding the implementation of SOI in the classroom. This guide has been written in response to those questions in the hope that it can be used to facilitate the development of SOI programs in this district and elsewhere.
The guide's major emphasis is not on theory, but on the "how to" aspects of the program. Those who are interested in more in-depth background on the SOI Model may wish to read *The Structure of Intellect: Its Interpretations and Uses* by Mary Nacol Meeker.

The suggestions for the use of SOI presented in this guide are just that, suggestions. Each teacher faces a unique situation in the classroom and will need to determine what materials can be adapted to each classroom.

It is hoped that, as teachers read this guide, they will develop a basic understanding of SOI, become aware of methods of implementing an SOI program, and will utilize references and resources in the implementation process.
# "C" Cognition Activities Grid
(Bloom's Comprehension)
(Comprehending with Meaning Beyond Perception)

<table>
<thead>
<tr>
<th>PRODUCTS</th>
<th>FIGURAL (F)</th>
<th>SYMBOLIC (S)</th>
<th>SEMANTIC (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Objects and Shapes</td>
<td>Numbers and Signs</td>
<td>Words and Ideas</td>
</tr>
<tr>
<td>Units</td>
<td>CFU-A -- auditory perception</td>
<td>CSU -- word matching</td>
<td>CMU -- vocabulary matching</td>
</tr>
<tr>
<td></td>
<td>CFU-V -- recognizing shapes</td>
<td>CSU-V -- scrambled words</td>
<td>CMU -- definitions</td>
</tr>
<tr>
<td></td>
<td>CFU-V -- visual closure</td>
<td>CSU-V -- crossword puzzles</td>
<td>CMU -- word definition</td>
</tr>
<tr>
<td>Classes</td>
<td>CFC -- picture class</td>
<td>CSC -- alphabetizing</td>
<td>CNC -- classes of product words, ideas</td>
</tr>
<tr>
<td></td>
<td>CFC -- taste, smell, touch</td>
<td>CSC -- letter grouping</td>
<td>CMC -- word classes</td>
</tr>
<tr>
<td></td>
<td>CFC -- classification of figures</td>
<td>CSC -- letter, even-odd</td>
<td>CMC -- word, card, lists</td>
</tr>
<tr>
<td>Relations</td>
<td>CFR -- what goes together</td>
<td>CSR -- coding reading</td>
<td>CMR -- word analogies</td>
</tr>
<tr>
<td></td>
<td>CFR -- match shapes to form</td>
<td>CSR -- code-decipher</td>
<td>CMR -- word relationships</td>
</tr>
<tr>
<td></td>
<td>CFR -- figure-ground</td>
<td>CSR -- code symbol decipher</td>
<td>CMR -- opposites</td>
</tr>
<tr>
<td></td>
<td>CFR -- dot-to-dot</td>
<td>CSR -- word matching</td>
<td>CMR -- word comparison</td>
</tr>
<tr>
<td></td>
<td>CFS-A -- auditory perceptual rhythm</td>
<td>CSS -- alphabetizing</td>
<td>CMS -- command sequence</td>
</tr>
<tr>
<td>Systems</td>
<td>CFS -- pattern repetition</td>
<td>CSS -- number/letter series</td>
<td>CMS -- money sequence</td>
</tr>
<tr>
<td></td>
<td>CFS -- repetition of verbal patterns</td>
<td>CSS -- number series</td>
<td>CMS -- arithmetic reasoning</td>
</tr>
<tr>
<td></td>
<td>CFS -- puzzle arrangement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transformations</td>
<td>CFT -- figure rotation, rel.</td>
<td>CST -- spoonerism</td>
<td>CMT -- synonyms</td>
</tr>
<tr>
<td></td>
<td>CFT -- cognition of fig. rot.</td>
<td>CST -- reading backwards</td>
<td>CMT -- rebus symbols</td>
</tr>
<tr>
<td></td>
<td>CFT -- rot. form board</td>
<td>CST -- spoonerism</td>
<td>CMT -- word transfers</td>
</tr>
<tr>
<td></td>
<td>CFT -- paper cutting</td>
<td>CST -- buried words</td>
<td></td>
</tr>
<tr>
<td>Implications</td>
<td>CFI -- maze tracing</td>
<td>CSI -- number concepts</td>
<td>CMI -- reasoning</td>
</tr>
<tr>
<td></td>
<td>CFI -- planning ahead</td>
<td>CSI -- block puzzle</td>
<td>CMI -- implications</td>
</tr>
<tr>
<td></td>
<td>CFI -- figure; pick-up-sticks</td>
<td>CSI -- number puzzle</td>
<td>CMT -- alike and different</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CMI -- paragraph implications</td>
</tr>
</tbody>
</table>

From: Meker, M., and Sexton, K. SAT Abilities Workbooks, Loyola University, Los Angeles 90045.
### GUilford's Operation: "M" Memory Activities Grid
(Bloom's Knowledge)
(Retrieval of Stored Information)

<table>
<thead>
<tr>
<th>PRODUCTS</th>
<th>FIGURAL (F)</th>
<th>SYMBOLIC (S)</th>
<th>SEMANTIC (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units</td>
<td>MFU--memory of objects</td>
<td>MSU--Morse code</td>
<td>MMU--memory of words</td>
</tr>
<tr>
<td></td>
<td>MFU--map memory</td>
<td>MSU--memory of letters/#s</td>
<td>MMU--memory flash cards</td>
</tr>
<tr>
<td></td>
<td>MFU--memory for figures</td>
<td>MSU--digit recall</td>
<td>MMU--definitions</td>
</tr>
<tr>
<td>Classes</td>
<td>MFC--memory for classes</td>
<td>MSC--memory of word classification</td>
<td>MMC--memory of classes</td>
</tr>
<tr>
<td></td>
<td>MFC--recall of classes</td>
<td>MSC--memory of numbers</td>
<td>MMC--memory of &quot;and&quot; words</td>
</tr>
<tr>
<td>Relations</td>
<td>MFR--study and recall, pos.</td>
<td>MSR--memory of letter ser.</td>
<td>MMC--memory of classes</td>
</tr>
<tr>
<td></td>
<td>MFR--placement memory</td>
<td>MSR--memory of names</td>
<td>MMC--word and symbol memory</td>
</tr>
<tr>
<td></td>
<td>MFR--memory of paired fig.</td>
<td>MSC--memory of number classes</td>
<td>MMR--antonyms</td>
</tr>
<tr>
<td>Systems</td>
<td>MFS--memory of positions</td>
<td>MSS--A--digit recall</td>
<td>MMS--following directions</td>
</tr>
<tr>
<td></td>
<td>MFS--mem. of seq. positions</td>
<td>MSS--A--nonsense words</td>
<td>MMS--calendar and weather</td>
</tr>
<tr>
<td></td>
<td>MFS--memory of positions</td>
<td>MSS--A--memory for musical notes</td>
<td>MMS--gossip game</td>
</tr>
<tr>
<td></td>
<td>MFS--A--mem. of rhythms</td>
<td>MST--misspelled words</td>
<td>MMS--story comprehension</td>
</tr>
<tr>
<td></td>
<td>MFS--V--mem. or pos. (blocks, page, designs)</td>
<td>MST--hidden words</td>
<td>MMS--days of week</td>
</tr>
<tr>
<td>Transformations</td>
<td>MFT--memory of transform.</td>
<td>MST--word transformation</td>
<td>MMT--homonyms</td>
</tr>
<tr>
<td></td>
<td>MFT--kaleidoscope</td>
<td>MST--number reversals</td>
<td>MMT--homonyms and meaning</td>
</tr>
<tr>
<td></td>
<td>MFT--block patterns</td>
<td>MST--homonyms in sentences</td>
<td>MMT--homonyms in sentences</td>
</tr>
<tr>
<td></td>
<td>MFT--paper folding</td>
<td>MSI--multiplication tables</td>
<td>MM--memory for implic.</td>
</tr>
<tr>
<td></td>
<td>MFT--picture rotations</td>
<td>MSI--arithmetic</td>
<td>MM--con. bwtn elem. info.</td>
</tr>
<tr>
<td>Implications</td>
<td>MFI--object recall</td>
<td>MSI--arithmetic sentences</td>
<td>MM--match job descriptions</td>
</tr>
<tr>
<td></td>
<td>MFI--figure recall</td>
<td>MSI--arithmetic sentences</td>
<td>MM--with characters in book</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MSI--auditory arithmetic</td>
<td></td>
</tr>
</tbody>
</table>

From Meeker, M., and Sexton, K. *SOI Abilities Workbk.* Loyola University, Los Angeles 90045.
<table>
<thead>
<tr>
<th>PRODUCTS</th>
<th>FIGURAL (F) Objects and Shapes</th>
<th>SYMBOLIC (S) Numbers and Signs</th>
<th>SEMANTIC (M) Words and Ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units</td>
<td>NFU--construction-reprod.</td>
<td>NSU--digit to symbol</td>
<td>NMU--name, picture groups</td>
</tr>
<tr>
<td></td>
<td>NFU--writing copy name</td>
<td></td>
<td>NMU--name, word groups</td>
</tr>
<tr>
<td></td>
<td>NFU--configuration</td>
<td></td>
<td>NMU--contractions</td>
</tr>
<tr>
<td></td>
<td>NFU--(V.M.)--copy signs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classes</td>
<td>NFC--clas. of shapes and its</td>
<td>NSC--nonsense words to class.</td>
<td>NMC--word classification</td>
</tr>
<tr>
<td></td>
<td>NFC--picture classifica.</td>
<td>NSC--class. nonsense words</td>
<td>NMC--classify word groups</td>
</tr>
<tr>
<td></td>
<td>NFC--cut and paste shapes</td>
<td>NSC--class. operation-math</td>
<td>NMC--job classification</td>
</tr>
<tr>
<td></td>
<td>NFC--clas. accord. to shape</td>
<td>NSC--classify shapes</td>
<td></td>
</tr>
<tr>
<td>Relations</td>
<td>NFR--form board manipula.</td>
<td>NSR--symbol classification</td>
<td>NMR--verbal analogies</td>
</tr>
<tr>
<td></td>
<td>NFR--sequence of size</td>
<td>NSR--core translation</td>
<td>NMR--parts of speech</td>
</tr>
<tr>
<td></td>
<td>NFR--typing bow</td>
<td>NSR--symbol relationship</td>
<td>NMR--antonyms and synonyms</td>
</tr>
<tr>
<td></td>
<td>NFR--block construction</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NFR--picture sequence</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systems</td>
<td>NFS--design reproduction</td>
<td>NSS--word changes</td>
<td>NMS--cartoon sequencing</td>
</tr>
<tr>
<td></td>
<td>NFS--bead stringing</td>
<td>NSS--alphabetizing</td>
<td>NMS--sequencing</td>
</tr>
<tr>
<td></td>
<td>NFS--map copying</td>
<td></td>
<td>NMS--time sequencing</td>
</tr>
<tr>
<td></td>
<td>NFS--copy color wheel</td>
<td></td>
<td>NMS--scrambled sentences</td>
</tr>
<tr>
<td></td>
<td>NFS--design reproduction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transformations</td>
<td>NFT--camouflaged objects</td>
<td>NST--camouflage (buried words)</td>
<td>NMT--new uses--fly clues</td>
</tr>
<tr>
<td></td>
<td>NFT--camouflaged highlights</td>
<td>NST--magic square numbers</td>
<td>NMT--composite stories</td>
</tr>
<tr>
<td></td>
<td>NFI--picture completion</td>
<td>NSI--algebra--fill in missing number</td>
<td>NMI--deduced implications</td>
</tr>
<tr>
<td></td>
<td>NFI--map completion</td>
<td></td>
<td>NMI--what would you do</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NMI--sequence association</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>NMI--deductions</td>
</tr>
</tbody>
</table>

From: Meeker, M., and Sexton, K. *SOI Abilities Workbooks*, Loyola University, Los Angeles 90045.
## CHART 4

### "D" DIVERGENT PRODUCTION ACTIVITIES GRID
(Bloom's Synthesis, Application)
(Creative Problem-Solving)

<table>
<thead>
<tr>
<th>FIGURAL (F)</th>
<th>SYMBOLIC (S)</th>
<th>SEMANTIC (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRODUCTS</strong></td>
<td><strong>Objects and Shapes</strong></td>
<td><strong>Numbers and Signs</strong></td>
</tr>
<tr>
<td><strong>Units</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DFU--elaboration-make many designs from figures</td>
<td>DSU--create words</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DSU--vocabulary development</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DSU--vocabulary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DSU--vocabulary building</td>
</tr>
<tr>
<td><strong>Classes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DFC--regroup and reclass.</td>
<td>DSC--alpha. classification</td>
</tr>
<tr>
<td></td>
<td>DFC--group fig. into class.</td>
<td>DSC--word classification</td>
</tr>
<tr>
<td></td>
<td>DFC--group letters into classification</td>
<td>DSC--numeral classification</td>
</tr>
<tr>
<td></td>
<td>DFC--classification of figures open-ended</td>
<td>DSC--classify words in various ways</td>
</tr>
<tr>
<td><strong>Relations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DFR--art faces</td>
<td>DSR--initials</td>
</tr>
<tr>
<td></td>
<td>DFR--tie dye designs</td>
<td>DSR--computation</td>
</tr>
<tr>
<td></td>
<td>DFR--create drawing</td>
<td>DSR--math wheels</td>
</tr>
<tr>
<td></td>
<td>DFR--create a toy</td>
<td>DSR--math computation</td>
</tr>
<tr>
<td><strong>Systems</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DFS--art-construction</td>
<td>DSS--sentence construction</td>
</tr>
<tr>
<td></td>
<td>DFS--block construction</td>
<td>DSS--math-base system</td>
</tr>
<tr>
<td></td>
<td>DFS--art designs</td>
<td>DSS--money systems</td>
</tr>
<tr>
<td></td>
<td>DFS--monograms</td>
<td>DSS--equations</td>
</tr>
<tr>
<td></td>
<td>DFS--art collages</td>
<td></td>
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<td><strong>Transformations</strong></td>
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<td></td>
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<tr>
<td></td>
<td>DFT--scribble drawing</td>
<td>DST--vocabulary building</td>
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<td></td>
<td>DFT--elaboration on shapes</td>
<td>DST--change letters</td>
</tr>
<tr>
<td></td>
<td>DFT--manip. of shapes</td>
<td>DST--make words from big words</td>
</tr>
<tr>
<td></td>
<td></td>
<td>DST--problem-solving</td>
</tr>
<tr>
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<td></td>
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</tr>
<tr>
<td><strong>Implications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>DFI--elab.-creative/non</td>
<td>DST--equations-make</td>
</tr>
<tr>
<td></td>
<td>DFI--dec. in diff. ways</td>
<td>DST--new ones</td>
</tr>
<tr>
<td></td>
<td>DFI--imag. drawings</td>
<td>DSI--chemistry</td>
</tr>
<tr>
<td></td>
<td>DFI--geo. drawings</td>
<td></td>
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From: Meeker, M., and Sexton, K. *SOI Abilities Workbooks*, Loyola University, Los Angeles 90045.
<table>
<thead>
<tr>
<th></th>
<th>F</th>
<th>S</th>
<th>M</th>
</tr>
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<td>EFU</td>
<td>ESU</td>
<td>EMU</td>
</tr>
<tr>
<td></td>
<td>Figural Similarities</td>
<td>Letter Discrimination</td>
<td>Match Pictures and Words</td>
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<tr>
<td></td>
<td>Picture Differences</td>
<td>Letter Patterns</td>
<td>Destripions</td>
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<td>Figure-Ground</td>
<td>Visual Discrimination</td>
<td></td>
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<td>EFC</td>
<td>ESC</td>
<td>EMC</td>
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<td></td>
<td>Picture Classification</td>
<td>Phonics Match</td>
<td>Judging Class Names</td>
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<td>Classification, Color &amp; Sound</td>
<td>Letter &amp; Number Classification</td>
<td>Concept Classification</td>
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<td></td>
<td>Taste, Similarities and Differences</td>
<td>Visual-Discrimination</td>
<td>Classification of Animals or Plants</td>
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<td>R</td>
<td>EFR</td>
<td>ESR</td>
<td>EMR</td>
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<td>Form Relations, Alike/Different</td>
<td>Equations</td>
<td>Color Rhymes</td>
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<td></td>
<td>Form Discrimination</td>
<td>Word Pairs</td>
<td>Related Words</td>
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<td></td>
<td>Nonsense Word Pairs</td>
<td>Verbal Analysis</td>
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<tr>
<td></td>
<td></td>
<td>Rank Continuance</td>
<td>Verbal Analogies</td>
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<td>EFS</td>
<td>ESS</td>
<td>EMS</td>
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<td></td>
<td>Construction of Picture</td>
<td>Judging Which Letter or</td>
<td>Sentence Construction</td>
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<td></td>
<td>Sequences</td>
<td>Number Series Do Not</td>
<td>Comprehension</td>
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<td>Sequence, Color and Shades</td>
<td>Belong</td>
<td>Verbal Absurdities</td>
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<td>T</td>
<td>EFT</td>
<td>EST</td>
<td>EMT</td>
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<tr>
<td></td>
<td>Figure Rotation</td>
<td>Jumbled Words</td>
<td>Cartoon Punch Lines</td>
</tr>
<tr>
<td>I</td>
<td>EFI</td>
<td>ESI</td>
<td>EMI</td>
</tr>
<tr>
<td></td>
<td>Mazes</td>
<td>Abbreviations</td>
<td>Logical Deductions</td>
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<td>Letter Consistency</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Map Reasoning</td>
<td></td>
</tr>
</tbody>
</table>

Reprinted with permission from the SOI Coloring Book, SOI Institute, 214 Main Street, El Segundo, CA 90245 (c) Mary Meeker 1977.
ASSESSMENT OF INTELLECTUAL ABILITY

The five SOL processes (cognition, memory, convergent production, convergent production, and evaluation) can be utilized without the individual student profiles. However, the use of the SOI profiles enables the teacher to identify curriculum for students on the basis of their needs. SOI profiles can be obtained by administering the SOI Learning Abilities Test or by analyzing standardized intelligence tests through the use of SOI templates. Templates for the Binet and the WISC-R are available from the SOI Institute. A profile obtained from the SOI Learning Abilities Test will be more complete and comprehensive than one obtained from a standardized IQ test. The SOI test is designed to test 90 intellectual abilities, whereas the Binet can be translated into 53 and the WISC-R into 26 (with no factors in divergent production).

The SOI Learning Abilities Test may be easily administered in the classroom to a group of students. It is not desirable to ask students to complete the test in one sitting, particularly younger children. Teachers are urged to take the test themselves before administering it to their students.

The Learning Abilities Test, along with complete instructions for administering and scoring, is available from the SOI Institute. See the "Teaching Resources" section of this guide for a list of Institute materials and services.

A sample Profile Derivation Work Sheet is presented on the following pages.

Scoring the test is simple with the exception of those areas concerned with originality in divergent production. When scoring originality teachers will be judging responses which will be unique to their classes, and they may wish to consider a tally of the responses to eliminate those that are not original.

Templates for scoring the test are not available but can be easily made by using a blank copy of the test and cutting out the boxes which correspond to the correct answers and placing it on top of the student's answers. The student's profile can be plotted by using the Profile Derivation Work Sheet. The computation must be done for each student and will take some time to complete. A profile and prescription can also be obtained by sending the test to the SOI Institute. The computer print-out, although time-saving for the teacher, involves an additional cost factor.

PREPARATION OF THE SOI PRESCRIPTION

Once a profile has been made for a student and his/her strengths and weaknesses are known, a prescription is prepared. If the computer print-out was used, the prescription is included. Teachers who plot the profile will also need to prepare the prescription. The prescription is made by pairing a strength with a weakness. The area of strength is used to assist in remediation. For example, in Chart 6 on page 15, the student is strong in Memory (8), but very weak in Transformation (2). HFT (Memory-FIGural Content-Transformation), MST (Memory-Symbolic Content-Transformation), and MMT (Memory-Semantic Content-Transformation) tasks would be prescribed for this student.
PROFILE ORIVATION WORKSHEET: PART I

Use this section to determine individual strengths and weaknesses in terms of: SPECIFIC SOI ABILITIES

*Use Weighted Values

**Use weighted values and be sure to total scores from both column A and column B
for DSR-f, DSR-s, and DSR-o

\[
\frac{(DFU-f_{\text{---}}) + (DFU-s_{\text{---}}) + (DFU-t_{\text{---}}) + [(t_{\text{---}}) \cdot D_{\text{---}}]}{7} = \frac{\text{---}}{8} = DFU \ldots \]

\[
\frac{(DMU-f_{\text{---}}) + (DMU-t_{\text{---}})}{17.5} = \frac{\text{---}}{8} = DMU \ldots \]

\[
(CFU + 2.0) = \frac{\text{---}}{8} = CFU \ldots \]

\[
(CMU + 3.75) = \frac{\text{---}}{8} = CMU \ldots \]

\[
(CFS + 3.25) = \frac{\text{---}}{8} = CFS \ldots \]

\[
(CFT + 3.25) = \frac{\text{---}}{8} = CFT \ldots \]

\[
(CMR + 3.125) = \frac{\text{---}}{8} = CMR \ldots \]

\[
(CMS + 2.625) = \frac{\text{---}}{8} = CMS \ldots \]

\[
(DFU_{*} + 23.25) = \frac{\text{---}}{8} = DSR \ldots \]

\[
(CSR) = \frac{\text{---}}{8} = CSR \ldots \]

\[
(MSU + 2.25) = \frac{\text{---}}{8} = MSU \ldots \]

\[
(MSS + 2.25) = \frac{\text{---}}{8} = MSS \ldots \]

\[
(MSI + 2.25) = \frac{\text{---}}{8} = MSI \ldots \]

\[
(EFU + 3.25) = \frac{\text{---}}{8} = EFU \ldots \]

\[
(CFC + 1.25) = \frac{\text{---}}{8} = CFC \ldots \]

\[
(EFC + 2.125) = \frac{\text{---}}{8} = EFC \ldots \]

\[
(ESC + 3.375) = \frac{\text{---}}{8} = ESC \ldots \]

\[
(CSS + 2.625) = \frac{\text{---}}{8} = CSS \ldots \]

\[
(ESS + 2.625) = \frac{\text{---}}{8} = ESS \ldots \]

\[
(NSS + 2.625) = \frac{\text{---}}{8} = NSS \ldots \]

\[
(\frac{\text{---}}{8}) = \frac{\text{---}}{8} = NST \ldots \]

\[
(MFU + 3.5) = \frac{\text{---}}{8} = MFU \ldots \]

\[
(NFU + 4.125) = \frac{\text{---}}{8} = NFU \ldots \]
**Profile Derivation Worksheet: Part II**

Use this section to determine individual strengths and weaknesses in terms of GENERAL SOI ABILITIES

<table>
<thead>
<tr>
<th>Subtest</th>
<th>Summary</th>
<th>Adjusted</th>
<th>Adjusted</th>
<th>Percentage</th>
<th>Weakness-Strength Index</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Scores</td>
<td>Score</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[
(CFU + CMU + CFS + CFT + CMR + CMS + CSR + CFC + CSS) = \frac{\text{Adjusted Scores}}{72} = \text{Cognition} \\
(MSU + MSS + MSI + MFU) = \frac{\text{Adjusted Scores}}{32} = \text{Memory} \\
(EFU + EFC + ESC + ESS) = \frac{\text{Adjusted Scores}}{32} = \text{Evaluation} \\
(NSS + NST + NSI + NFU) = \frac{\text{Adjusted Scores}}{32} = \text{Convergent} \\
(DFU + DMU + DSR) = \frac{\text{Adjusted Scores}}{24} = \text{Divergent} \\

\[
(DFU + CFU + CFS + CFT + EFU + CFC + EFC + MFU + NFU) = \frac{\text{Adjusted Scores}}{72} = \text{Figural} \\
(DSR + CSR + NSU + MSS + MSI + ESC + CSS + ESS + NSS + NST + NSI) = \frac{\text{Adjusted Scores}}{88} = \text{Symbolic} \\
(DMU + CMU + CMR + CMS) = \frac{\text{Adjusted Scores}}{32} = \text{Semantic} \\

\[
(DFU + DMU + CFU + CMU + MSU + EFU + MFU + NFU) = \frac{\text{Adjusted Scores}}{64} = \text{Units} \\
(CFC + EFC + ESC) = \frac{\text{Adjusted Scores}}{24} = \text{Classes} \\
(CMR + DSR + CSR) = \frac{\text{Adjusted Scores}}{24} = \text{Relations} \\
(CFS + CMS + MSS + CSS + ESS + NSS) = \frac{\text{Adjusted Scores}}{48} = \text{Systems} \\
(CFT + NST) = \frac{\text{Adjusted Scores}}{16} = \text{Transformations} \\
(MSI + NSI) = \frac{\text{Adjusted Scores}}{16} = \text{Implications} \\

10° C

---

*weakening*, *average*, *strengthening*
### Chart 6

**Summary Scores for Student**

<table>
<thead>
<tr>
<th>SOI Dimension</th>
<th>Adjusted Score</th>
<th>% of Dimension</th>
<th>Strong/Weak Index (1=Weakest 9=Strongest)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operations:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognition</td>
<td>43.27 OF</td>
<td>72</td>
<td>60</td>
</tr>
<tr>
<td>Memory</td>
<td>22.29 OF</td>
<td>32</td>
<td>70</td>
</tr>
<tr>
<td>Evaluation</td>
<td>22.90 OF</td>
<td>32</td>
<td>72</td>
</tr>
<tr>
<td>Convergent</td>
<td>17.69 OF</td>
<td>32</td>
<td>55</td>
</tr>
<tr>
<td>Divergent</td>
<td>7.30 OF</td>
<td>24</td>
<td>31</td>
</tr>
<tr>
<td><strong>Contents:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Figural</td>
<td>40.04 OF</td>
<td>72</td>
<td>57</td>
</tr>
<tr>
<td>Symbolic</td>
<td>55.63 OF</td>
<td>66</td>
<td>63</td>
</tr>
<tr>
<td>Semantic</td>
<td>17.04 OF</td>
<td>32</td>
<td>53</td>
</tr>
<tr>
<td><strong>Products:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Units</td>
<td>33.88 OF</td>
<td>64</td>
<td>53</td>
</tr>
<tr>
<td>Classes</td>
<td>14.54 OF</td>
<td>24</td>
<td>61</td>
</tr>
<tr>
<td>Relations</td>
<td>11.96 OF</td>
<td>24</td>
<td>50</td>
</tr>
<tr>
<td>Systems</td>
<td>37.63 OF</td>
<td>46</td>
<td>70</td>
</tr>
<tr>
<td>Transforms</td>
<td>5.42 OF</td>
<td>16</td>
<td>34</td>
</tr>
<tr>
<td>Implicitns</td>
<td>10.10 OF</td>
<td>16</td>
<td>63</td>
</tr>
</tbody>
</table>

A grid with the SOI factors identified is helpful for recording the recommended prescriptive curriculum. An example of such a grid for a class is shown in Chart 7. As names are placed on the grid as a result of the prescriptions, natural groupings of students become obvious. This grid is convenient for identifying the tasks needed for students and for assigning aides, parents, or tutors to particular groups.

A similar grid can be made up for the student to be included in his/her folder. (See Chart 8.) Students who work well independently can use the grid as an aid in selecting materials and activities they need to work with, or in planning their own contracts. A blank grid is presented as Chart 9 for teacher use. The name of the operation should be noted in the upper right-hand corner and the code letter for the operation added as the first letter of the trigrams in each cell.

Once teachers have compiled information from the students' profiles, they will be concerned with curriculum materials that fit the prescriptions. Workbooks developed by Dr. Meeker for each of the five operations are available through the SOI Institute. Materials have also been developed by Creative Prescription, Unlimited at East Whittier, California. Information on these guides is available through the East Whittier School District. The remainder of this guide presents additional materials.

If the budget allows, teachers may wish to have the SOI Institute prepare individual workbooks for students. These workbooks are made up of the activities from the SOI Activities Workbooks which are prescribed for the student. Once teachers have developed students' prescriptions, they may create their own personalized workbooks by duplicating and pulling those materials prescribed for a student folder.
Many commercially prepared games fit very well into the SOI program. A list of materials developed through a PAR project at Austin State School is included in this section. The materials have been assigned trigrams for the factor or factors for which they are best used. In addition, a supplementary list of materials used in the pilot program at Ericson Elementary School in the SOI Lab is presented. These materials can be coded to fit into a prescriptive curriculum and, as a manipulative, offer another dimension to the SOI program.

As teachers work with the SOI curriculum they will find that, as good teachers, they have been doing many of the things prescribed. However, SOI shows how these activities fit into the different levels of thinking. SOI also develops a consciousness of a more balanced curriculum designed to give students an intellectual discipline which encourages higher levels of thinking.

CLASSROOM ACTIVITIES BASED ON THE STRUCTURE OF THE INTELLECT

To plan a unit of study, a learning center, or a daily assignment use the web below to select verbs (process) and nouns (product) when writing questions or planning activities. Each pie-shaped piece represents one of the thought processes as defined in the structure of intellect.
ORGANIZATION AND TEACHING STRATEGIES

As with any new program, the implementation of SOI will present challenges in organization and in use of teaching strategies. Ideas which have been helpful to teachers in the past are presented here so that they may be used by others.

- For easy and quick identification, color code materials to correspond with the colors of the SOI Operations Workbook.

- Check existing math and reading materials, and code them for SOI use.

- Keep manipulatives for each operation in a large box or on a separate shelf. For example, all materials (games, task cards, etc.) for Evaluation should be together in a box labeled "Evaluation." This gives mobility and helps to keep the materials for each operation separate.

- File curriculum material in folders labeled with the trigram that corresponds to the activity. These can then be pulled as needed.

- Collect materials needed to complete tasks in the SOI Abilities Workbook. A list of materials needed for each operation is presented in this section of the guide.

- Charts which identify the SOI operations and ways of defining them are helpful to the students as they become acquainted with the program.

- Separate student folders for each operation for assignments and contracts. Folders can be coded in the color used for the operation.

- At first, set aside a particular time in the schedule for SOI rather than trying to introduce its principles into other subject areas. As the teacher and students become more familiar with the concepts, SOI will eventually affect the entire instructional program.

- To begin, the teacher should introduce one operation at a time. Once he/she feels secure about it, another operation may be added. After all five operations have been introduced, students may rotate through them, using either five groups, one for each operation, or five activities with an operation.

- Use and define SOI vocabulary with the students. Teachers will be surprised how quickly students pick it up and understand the processes.

- As the teacher becomes familiar with the program, he/she should show that SOI is not an isolated part of the curriculum. Physical education, music, and art may present figural transformations or implications, or elements of memory or evaluation.

- Talk to students about how they solved a problem or how to train the memory. Students will begin to think about how they use their minds.
<table>
<thead>
<tr>
<th>PRODUCTS</th>
<th>FIGURAL (F)</th>
<th>SYMBOLIC (S)</th>
<th>SEMANTIC (M)</th>
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<tbody>
<tr>
<td>Units</td>
<td>NFU Jane Sandy</td>
<td>NSU</td>
<td>NMU</td>
</tr>
<tr>
<td>Classes</td>
<td>NFC</td>
<td>NSC Eric</td>
<td>NMC Mike Jeff Shane</td>
</tr>
<tr>
<td>Relations</td>
<td>NFR Jane</td>
<td>NSR Eric Christina</td>
<td>NMR</td>
</tr>
<tr>
<td>Systems</td>
<td>NFS Lincoln</td>
<td>NSS Christina Greg</td>
<td>NMS Mike Jane</td>
</tr>
<tr>
<td>Transformation</td>
<td>NFT</td>
<td>NST Mike Todd Gina Jane Mark Christy Eric Shane Greg Jeff Lincoln Eric</td>
<td>NMT Mike Jane</td>
</tr>
<tr>
<td>Implications</td>
<td>NFI Eric</td>
<td>NSI Todd Christina Christy Eric</td>
<td>NMI Mike Jeff</td>
</tr>
<tr>
<td>Units</td>
<td>FIGURAL (F) Objects and Shapes</td>
<td>SYMBOLIC (S) Numbers and Signs</td>
<td>SEMANTIC (M) Words and Ideas</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------------------</td>
<td>--------------------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>NFU</td>
<td></td>
<td>NSU</td>
<td>NMU</td>
</tr>
<tr>
<td>Classes</td>
<td>NFC</td>
<td>NSC</td>
<td>NMC</td>
</tr>
<tr>
<td>Relations</td>
<td>NFR</td>
<td>NSR</td>
<td>NMR</td>
</tr>
<tr>
<td>Systems</td>
<td>NFS</td>
<td>NSS</td>
<td>NMS</td>
</tr>
<tr>
<td>Transmission</td>
<td>NFT</td>
<td>NST</td>
<td>NMT</td>
</tr>
<tr>
<td>Implications</td>
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<td>NSI</td>
<td>NMI</td>
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</table>

(Student's Copy)
## CHART 9

<table>
<thead>
<tr>
<th>Units</th>
<th>FIGURAL (F)</th>
<th>SYMBOLIC (S)</th>
<th>SEMANTIC (M)</th>
</tr>
</thead>
<tbody>
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<td>Numbers</td>
<td>Ideas</td>
</tr>
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<td></td>
<td>Shapes</td>
<td>and Signs</td>
<td>and Words</td>
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<td>SU</td>
<td>MU</td>
<td></td>
</tr>
<tr>
<td>FC</td>
<td>SC</td>
<td>MC</td>
<td></td>
</tr>
<tr>
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<td>SR</td>
<td>MR</td>
<td></td>
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<tr>
<td>FS</td>
<td>SS</td>
<td>MS</td>
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</tr>
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<td>ST</td>
<td>MT</td>
<td></td>
</tr>
<tr>
<td>FI</td>
<td>SI</td>
<td>MI</td>
<td></td>
</tr>
</tbody>
</table>

| Classes        |             |              |              |
|                |               |              |              |
|                |               |              |              |
|                |               |              |              |
|                |               |              |              |

| Relations      |             |              |              |
|                |               |              |              |
|                |               |              |              |
|                |               |              |              |

| Systems        |             |              |              |
|                |               |              |              |
|                |               |              |              |
|                |               |              |              |

| Transformation |             |              |              |
|                |               |              |              |
|                |               |              |              |
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| Implications   |             |              |              |
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SOI TASKS TO BE USED IN REMEDIAL READING*

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*Tasks are kept separate for each SOI workbook.*
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| of Shapes                     | DFC  |
| Composition                   | DMT  |
| Consequences                  | DMT  |
| Creative Titles               | DMU  |
| Elaboration                   | DFT  |
| Idea Classification           | DMC  |
| Implications                  | DMI  |
| Initials                      | DSR  |
| Proverbs                      | DMI  |
| Reading Comprehension         | DMU  |
| Rhyme Production              | DMR  |
| Sentence Building             | DMS  |
| Sequences                     | DMS  |
| Similes                       | DMS  |
| Unusual Uses                  | DMU  |
| Vocabulary Building           | DST  |
| Development                   | DSU  |
| Word Building                 | DMC  |
| Classification                | DSC  |
| Production                    | DMU  |
RESOURCES

The materials in this section are included for teacher reference and to provide assistance in planning and developing an SOI program. This section includes the following headings:

Teacher Reference. Materials helpful to the teacher for personal reference; materials which can be used in the classroom program.

SOI Classification of Educational Materials. Commercially prepared materials coded to correspond with the SOI factors.


Materials List for SOI Abilities Workbook. A list of items needed in order for students to complete the SOI Abilities Workbook activities.

Guide to Curriculum Activities Based on the SOI Factors. A grid on each of the five operations identifies the type of curriculum which corresponds to each factor. This grid is useful in identifying materials for the SOI factors and developing activities.

SOI Institute List of Materials and Services

Teacher Reference

Aleksich, Sue. Vowel Owl: Primary Phonics; Sound Soda; Activity Book; Language Lollipop; Happy Cat Award Pad; Toy Bird Award Pad; Happy Dog Award Pad; Super Work Award Pad. Kids & Co., P.O. Box 49034, Los Angeles, CA 90049.


*Creative Prescriptions Unlimited, Grades 1-2; 3-4; 5-6; 7-8.* East Whittier City School District, Eleanor M. Manning, Director. ESEA Title III; Developing Divergent Modes of Thinking.


Labiberte, Norman, and Kehl, Ritchey. 100 (Ways to Have Fun with an Alligator) and 100 (Other Involving Art Projects). New York: Art Education Inc., 1969.


Teaching Strategies to Develop Children's Creative Thinking. El Cajon, CA: Cajon Valley Union School District, 189 Roanoke Road, Box 1129, 92022.


## SOI Classification of Educational Materials
(PAR Project, Austin State School, Austin, Texas)

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| Milton Bradley | Addition-Subtraction Quizmo  
Vegetables and Fruits Poster Cards | NSS, CSR, ESR  
CFU, CFC, EFC |
| Ideal        | Enlarged Place Value Sticks  
Baby Bolts  
Sequence Pictures  
Stencils for Tracing  
Perceptual Development Cards | CMR  
CFR  
NFS  
NFU  
NFU (Set 1)  
MFU (Set 2) |
|              | Classification Charts  
How to Tie a Bow  
Colored Cubes  
Sequence Cards  
Counting Bars  
Cubical Counting Blocks  
Community Helper Crossword Puzzle  
Transportation and Communication Crossword Puzzle  
Plastic Measuring Jars  
Place Value Board  
Sundial  
Large Rulers (demonstration)  
Rhyming Puzzle  
Subtraction Flash Cards  
Flash Cards Addition  
Thermometer  
Smokey the Bear Game  
Crossword Puzzles (food)  
Holiday Crossword Puzzles | CFC, MFC, CFR  
CFS  
CFU, CFR, MFU, MFR  
CFS, CMS, EMS, EFS  
CFS  
EMS, CMR, EFS  
EMS, CMR, CMS, NMS  
CSS, EMS, CMS  
CSS, NSS  
CFR, CSS, CMR  
CSS  
CMR, EMR, CMU, CVU  
NSS  
NSS  
CSS, ESS  
CFR, CSR  
CMR, NMR  
CMR, NMR |
| Edukaid      | Number Tree                                                                 | CSS, CSR       |
| Whitman      | Flash Cards (+ and -)  
Hi Ho Cherry O  
Superman Flying Bingo  
Lacing Cards  
Help Yourself Picture Nouns  
Let's Do Dots  
Begin'ning Arithmetic Grades 1 & 2  
Bingo for Young & Old  
Puzzles | CSR  
CFR  
NFC  
NFR  
EMR, CMR  
CFR, CSR  
NSS  
CSS  
CFR, NFR |
| Instructo    | Classification Game  
Numerals and Counting Shapes  
My Face and Body  
Positions in Space Posters | CFC, NFC  
CFU, MFU, NFU, CSU  
CFR, NFR |
| Play Doh     | Modeling Clay, Papier-Mache  
Play doh | NFU  
NFU, DFU |
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| Educational Projects    | Seasons Learning; Manual        | NMR, CMR, EMS, EFU, EMR |

<p>| Preschool               | Association Puzzle              | CFR                   |
|                        | Toy Builder                     | MFU, DFU              |
|                        | Triangle Puzzles                | CFR                   |
|                        | Match-Up Puzzles                | CFR, EFR, CMR, EMR    |
|                        | Rainbow Tree                    | CFR, NFS              |</p>
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<td>Blind</td>
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<td>Child's World</td>
<td>Animals That Provide Food</td>
<td>CFU, CFR, CMR</td>
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<td>Animals That Help Us</td>
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<td>Sum Stick</td>
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<td>Color Cubes/Design</td>
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Milton Bradley & Ideal
Peg It Number Boards
CSR, NSR

Platt & Munk
Animal Picture Puzzles
CFR

Sifo, Playschool
Wooden Puzzles
CFR

Selchow & Righter Co.
Scrabble for Junior
DMU

Preschool-Elementary Ed.
Moods & Emotions Teaching Pictures
EMR, CMR

Count and Match Kit
CFR, CSR, CSS

Counting Blocks
MFU, CFU, MFS, NFS

Puppet Playmates
NFU

Phono-Viewer Programs
CMR, CSS (numbers)

Aquarium/Fishes
CFU

Farm Animals Picture
CFU

Puzzles
CFR

Language Concepts in Song
MMU

Positions Poster
CFR

Fabric Texture Book
CFU, CFR, CFC

Number Sequence
CSU, CSS, NSU

Colors and Shapes
CFR

Number 1-10
CFR

Giant Beaded Dominoes & Number Cards
CMR, CSR, CSU

Picture Word Builder Puzzle
CMR, CMU

Magnetic Counting Disc and Thirty Frame
CFR

Learn-to-Write Manuscript Letters
NFU, MFU

Form Puzzle
CFR

Wooden Traffic Signs
CMU, CMI

Wooden Puzzles
CFR

Beads
NFU (If copying)

Add-a-Count Scale
ESR

Shape Board and Shapes
NFR, CFR

Flannel Animals
CFU

Flannel Pets
CFU

Flannel Cars and Trucks
CFU

Animals in a Pond
CFU

Arithmetic Readiness
CFU, CMU, CFR

Understanding Our Feelings
CMR

Discovering Opposites
CFR

Classification Game (season)
CFR, CFC, NFC, MFR

Fractional Pies
NFU, NSU

Number Cards
NFU, CFU, CSU

Time Games
NSS, CSS

Match Puzzle Picture with Words
CFR, CMR, CMU

Alphabets
CSU

Desk Calendar (for students)
CMS

Tennis Shoe
NFS, NFR

Count-a-Ladder
CSS, NFS

Bead Boards
CFS

Nuts and Bolts
EFR, NFR
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<tr>
<td>Preschool-Elementary Ed.</td>
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<td>Dimensional Color Block Design</td>
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<td>Buzzer Board Pattern Cards</td>
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<td>Position in Space Posters</td>
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<td>Vowels Link Poster Cards</td>
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<td>Flannel Cutouts</td>
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<td>Color and Shapes Matching</td>
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<td>Let's Play Safe</td>
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<td>Number Tree and Pegs</td>
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<td>(measurement, money, etc.)</td>
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<td>Clock Flash Cards</td>
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<td>Measuring Cups</td>
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</table>
### Preschool-Elementary Ed.

- Uncle Wiggly Game
- Kitchen Bingo
- Foodland
- Handmade Cutouts (kitchen utensils, foods, cleaners)

### Ericson Elementary School Lab Materials

#### Comprehension

- **American Teaching Aids**
  - Tangrams
  - CFU

- **Creative Teaching Assoc.**
  - Attribute Dominoes
  - CFR

- **Educational Insights Inc.**
  - Mazes and Puzzles
  - CFI

- **Educational Supplies**
  - Tracking Skills for Reading
  - CFR, NFU, NMI

- **Ideal School Supply Co.**
  - Visual Closure Cards
  - CFU

- **Invicta Plastics Ltd.**
  - Bead Frame Abacus
  - CFS

- **Leasure Learning Pro.**
  - Brainy blocks
  - CFR, CSI, EFC
  - CSS

- **Milton Bradley Co.**
  - Ten-Tens Counting Frame
  - CFS

- **Otto Maier Verlag**
  - Triangle Domino
  - CFC, NFC

- **Parker Brothers**
  - Grapple
  - CSU, MST

- **Pressman Corp.**
  - Tri-Ominos
  - CFR, NFR

- **Trend Enterprises**
  - Wipe-Off Cards
  - Untangle the Maze
  - Telling Time Level 2
  - CFI, NFI
  - CMS

#### Memory

- **Ace**
  - Rembi--Cars
  - MFU

- **Eichhorn**
  - Eichhorn--Play School
  - MFU, MFR, MSU, MSR

- **Ideal**
  - Deluxe Pegboard Patterns
  - MFU
  - Large Pegboard Patterns
  - MFU
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<td>Jumbo</td>
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<td>Mem-o-spell</td>
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<td>Boggle</td>
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<td>SEE 3 Bridge Street Newton, MA</td>
<td>Thinker Things</td>
<td>MFR, MFU</td>
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<td>Sio</td>
<td>Sio Mosaic</td>
<td>MFR</td>
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<td>Tournament Checkers</td>
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<td>Kaleidoscope Puzzles</td>
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<td>Trend Enterprizes</td>
<td>Wipe-Off Cards (levels 1 and 2)</td>
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<td>Tinkertoy</td>
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<td>Selchow &amp; Richter Co.</td>
<td>Scrabble (Sentence Cube Game)</td>
<td>DSI</td>
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52
The following lists of items are needed in order for student to complete the SOI Abilities Workbook activities. The five lists correspond to the five operations in SOI.

### Cognition

1. 2 maps depicting human skeleton
2. 2 packages plastic straws
3. 1 dozen paper plates
4. 3 coffee cans
5. 1 package pinto beans
6. 1 plastic bottle with lid
7. Glitter
8. 1 ball of string
9. 5 key rings
10. 27 circles cut out of construction paper in different colors
<table>
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<td>11. 1 package graph paper</td>
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<tr>
<td>12. 1 package tagboard, 12&quot; square</td>
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<tr>
<td>13. Tissue paper, 3 colors</td>
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<tr>
<td>14. Scraps of cloth</td>
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<tr>
<td>15. 5&quot; x 8&quot; index cards (plain white)</td>
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<td>16. 1 box straight pins</td>
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<td>17. 1 paint brush</td>
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<td>18. Compass</td>
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<td>19. 1 box gummed stars</td>
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<tr>
<td>20. 5 nails</td>
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<tr>
<td>21. &quot;Hoolaces (thin black nylon kind)</td>
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<tr>
<td>22. Thin wooden blocks, 4&quot; square (1/2 dozen)</td>
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<tr>
<td>23. 4&quot; x 8&quot; rectangle (1/2 dozen)</td>
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<tr>
<td>24. 1/2 dozen wooden dowels, 3/8&quot; diameter</td>
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<tr>
<td>25. Paper towels</td>
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<tr>
<td>26. Cardboard geometric shapes (all kinds, 1 dozen)</td>
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<tr>
<td>27. 1 package colored pencils</td>
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<tr>
<td>28. 1 package large eye needles</td>
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<tr>
<td>29. Compass</td>
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<tr>
<td>30. 1 package rubber bands</td>
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<tr>
<td>31. 1 dozen nails</td>
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<tr>
<td>32. 1 package paper clips</td>
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<tr>
<td>33. 1 strawberry basket</td>
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<tr>
<td>34. 1/2 dozen 8-1/2&quot; x 11&quot; outline maps of Africa</td>
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<tr>
<td>35. 1 ball pearl cotton crochet string</td>
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</table>

**Memory**

1. White butcher paper (small roll)
2. 1 box wooden colored pegs
3. 1/2 dozen wooden dowels
4. Toy items (plastic figures)
5. 1 deck of cards
6. Wooden cubes and cylinders (1/2 dozen)
7. Wood rectangle scraps
8. 3" x 5" cards (lined)
9. 36 small nails
10. 1/2 dozen plastic spoons
11. Bells
12. Magazine pictures of wild animals

**Convergent Production**

1. Tagboard
2. Plastic cookie holders from store
3. Coffee cans
4. Tambourine/bells
5. 4 milk cartons
6. Plastic coins
7. Paper money (bills)
8. 2 dozen wooden dowels, 3/8" diameter, 2' long
9. 6 different spices in jars
10. Sponge
11. 1 dozen paper cups
1. 1/2 dozen sheets fine sandpaper
2. 1 package styrofoam cups
3. 2 packages pinto beans
4. 1 coffee can
5. 3 kinds of wallpaper -- partial rolls
6. 1 package colored wooden 1/2" spheres
7. Glitter
8. Scrap of cloth
9. Paper numbers, 1-10
10. Pliers
11. 1 dozen popsicle sticks
12. 1 box tacks
13. 1 box brads
14. 1 package tagboard, 8-1/2" x 11"
15. Rug samples, 3 kinds
16. 1 package 3" x 5" index cards (plain)
17. 1 stamp pad for re-inking
18. 1 pair shoe laces
19. 1 paper lunch sack
20. 4 separate jars (baby food jars are perfect) filled with cotton, each having been dipped in a different odorous liquid

**Evaluation**

1. 1 roll paper towels
2. 1 box 1/2" cubes, spheres, and cylinders (colored beads)
3. 2 skeins of knitting yarn (2 different colors)
4. 1/2 dozen paper cups (different sizes)
5. 1 package pipe cleaners
6. 1 package compressed charcoal sticks
7. 2 dozen popsicle sticks
8. 1 box flat toothpicks
9. 12 scraps of cloth (good-sized, different)
10. 1/2 dozen cardboard tubes from wrapping paper or towels
11. 1 roll of white rice paper or equivalent
12. 1 ball of string
13. 1 package of different buttons
14. Dried seed pods from San Diego trees
15. 2 small plastic film reels
SOI Institute List of Materials and Services

**BOI INSTITUTE**
A non-profit corporation
214 MAIN STREET
EL SEGUNDO, CA. 90245
(213) 322-5985

**REFERENCE MATERIALS AND INSERVICE TRAINING MATERIALS**

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<tbody>
<tr>
<td>Beginner's Reader about the SOI Model</td>
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<tr>
<td>Textbook by Mary Meeker     SOI Its Interpretation and Uses</td>
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<tr>
<td>Manual for Training Teachers Basic SOI Theory A Programmed Text</td>
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<tr>
<td>Collected Papers SI and SOI Applications and Uses</td>
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<td>SOI Questioning Techniques for Teachers</td>
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**SOI ABILITIES WORKBOOKS AND ANALYSES**

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<tr>
<th>Category</th>
<th>Workbook Title</th>
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**SOI TESTS AND SCALES**

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**INDIVIDUAL TESTING AT SOI INSTITUTE**

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Prices have not been included since they are subject to change. A current price list may be obtained by contacting the SOI Institute.
Cognition is the immediate discovery, awareness, rediscovery, or recognition of information in various forms, comprehension or discovery. In terms of the dynamics of learning, cognition or comprehension would seem to be the primary process since every other activity presupposes perception and awareness of stimuli with the associated ability to discriminate.

If one of our goals with the Structure of the Intellec: is to teach children how to learn, then we need to make some learning enjoyable and free of pressure. Students need learning experiences that have as a simple goal pure comprehension. They need to be presented information for the sheer fun and practice of stimulation. This guide has been prepared with the intent of providing materials for the teacher to meet this goal.

The terms cognition and comprehension are used interchangeably in this material.

Questions that begin with "what," "where," "when," or "who" usually are at the cognitive level whereas questions that begin with "how," "why," or "in what other ways" tend to deal at the higher levels such as divergent production or evaluation.

Much of what you are now doing in your classroom deals with cognition and can be easily coded with the cognition chart on the following pages. Examples:

- **CSE** Crossword Puzzles
- **CSC** Search Puzzles
- **CSU** Scrambled Words
- **CMU** Vocabulary Matching
- **CNU** Definitions
- **CNC** Word Classifications
- **CMR** Opposites

These areas are best developed with materials specifically chosen to meet the level and interests of your students and are readily available both commercially and in your present curriculum materials.

**GLOSSARY OF SOI FACTOR DEFINITIONS IN COGNITION**

*(Wise-K Analysis)*

- **CFT** - Ability to identify objects by name, visually, and auditorially
- **CFC** - Classifies perceived objects
- **CFR** - Ability to discover relations in perceptual material
- **GFS** - Perceives spatial patterns and maintains orientation
- **GFT** - Manipulates or transforms objects into another visual arrangement
- **CFI** - Explores visually ways to select most effective action
- **CSC** - Discovers complex relationships, patterns, or systems
- **CSR** - Discovers relations involving letter patterns
- **CSS** - Ability to discover complex relationships forming patterns or systems
CMU - Vocabulary
CHR - Ability to identify classes of words
CMR - Discovers relations in conceptual, abstract meanings
CMS - Ability to comprehend or structure problems in preparation for solving them
CMT - Sees several meanings to a word or expression
CMH - Anticipates needs or consequences of a given situation
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Many of the commercially prepared educational materials can be used to supplement the activities and materials developed for 501 operations. The following list presents materials which have been coded for the cognitive operation. In some cases, it was found that the materials could be used for several different cells in the 501 label and were coded accordingly. Additional cells (codes) are indicated on the envelope.

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Milton Bradley

Materials

- Traffic Signs
- Color Stacking Discs
- Plant Growth
- The Seasons
- The Family
- Story Kits
- Musical Instruments
- Useful Signs to See & Read
- Space Relationship Cards
- Sequence Cards
- Alphabet Picture Words
- Fraction Discs
- Beads and Laces
- Assorted Puzzles
- Walk on Number Squares
- Story Cards (Tell What is Missing)
- Arithme-Sticks
- Phonetic Quizmo
- Flash Words
- Summit-Global Strategy
- Homonym Poster Cards
- Synonym Poster Cards
- Antonym
- Hundred Chart
- Pick Pairs Game
- Map of U.S. & World Puzzle
- Tick Tock Primary Clock
- Money Cards
- Tell Time Quizmo
- Cards, Numbers 1-10
- Multiplication and Division Quizmo
- Clock
- Dial and Spell
- Colored Dot Dominoes
- Addition-Subtraction Quizmo
- Vegetables and Fruits Poster Cards

Ideal

- Enlarged Place Value Sticks
- Baby Bolts
- Classification Charts
- How to Tie a Bow
- Colored Cubes
- Sequence Cards
- Counting Bars
- Cubical Counting Blocks
- Community Helper Crossword Puzzle
- Transportation and Communication Crossword Puzzle
- Plastic Measuring Jars
- Place Value Board
- Sendmail
- Large Rulers (Demonstration)
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Materials

Company

Hasbro Industries, Inc

Twinkle Toy Jewels

Hayes Publishing Co.

Good Manners Posters
Health Posters

Teacher Made

Matchups:

Animals and Homes
People and Jobs
Colors and Shapes

Domestic Animals and Pets
The Family
The Farm
Story Kit

Seasons

Animal Lotto
Number Bingo 1-10
Shape Cards
Numbers Cards 1-10
Days of Week Cards
Months of Year Cards
Seasons Cards
Puzzles
Templates

Match for Shape and Color
Number-Shape Bingo
What's Missing Cards
Body Parts - What's Missing
Classification of Happy Faces
Money In the Bank
Clock

Word Cards (Distar)
Clocks (Different Times)

Months of Year
Cards - Items with Price
Addition (House No.)
Cards (food with price)
Addition - Subtraction Game

Educational Projects

Seasons Learning Manual

Playschool

Association Puzzle
Triangle Puzzles
Match-Up Puzzles
Rainbow Tree
Parquetry Blocks
Color and Shape Holder
Workbenches
Matchups

Abacuses

Shape Groups

Creative Playthings

Fractional Fruits

Code

CFU, CFR, (MFU, MFR, MFS)

CMR, CFR, (EFR, EMR)

CFU, CMU, CMR

CFU

CMU

CMU

CMR, CFR, (EFR, EMR)

CFU

CSS, CFC

CFR, CMR

CFR, (NSR)

CSS, (EFR)

CFU

CFR

CSS, (ESS)

CMS

CSU, CFU, (ESR)

CSR

CSU, CFU, (ESR)

CMR, (NFR, MFR, MFU)

CFU, CFR

CFR

CFR

CFR, (EMR)
Transogram Co.  
Nifty-Houston  
Sifo  
Garr.  
Edu-Cards

Materials

Company

Materials

Tom & Jerry Adventures In Blunderland
Math Bingo
Puzzles, Low Primary
Puzzles
Clock
Who Gets It?
Picture Readiness Game
Dolch Basic Sight Vocabulary Cards
Dolch Popper Words
What the Letter Says (Dolch)
Jumbo Lotto "Community Helpers"
Lotto-The World About Us
Zoo Lotto
What's Missing Lotto
ABC Lotto
Farm Lotto
Go-Together Lotto
Object Lotto
Riddle-a-Rhyme
Simple Object Bingo (color cued)
The World About Us Lotto

Hallmark
Colorforms
Shackman
Milton Bradley
Allied Educational
Tools for Education
Kenworthy Ed. Service
Gelles-Widner
Stuck

Spelling Kit
Little Red Riding Hood Colorforms
Shapes, Colors and Forms
Tens Counting Frame
Human Body Parts
O'Hare Starite Program
Number Aid
Phonic Rummy Set A & B
Phonics for Reading
Play Way "Look" Dolch
Basic Phrase Flash Cards

Code

CFR, CSR
CSS
CFR
CMS, CSS, CFR, CMR, (NMS, NRF, NMR)
CFR, CMR, (EFR, EMR)
CFR, CFU, (NFR)
CMU
CMU
CMR, CSU, (EMR, ESR)
CFR
CFR, CMR
CMU, CFU, CMR, CFR, (EMR, EFR, EMU, EFU)
CMU, CFR, CFU, (EMU, EFU)
CSR, CRR, CMR, CSU, CMU, CFU, (ESR)
CFU, CFC, CMC, CFR, CMU, (EFU, EMU)
CFR, (EFU, EFR)
CMR, CFR, CFC, CFU, CMU, (EMU, EFU)
CMR
CFR, CFU, CFC, (EFR)
CFR, CFU, CMU, (EMU, EFU)
CSC
CFR, (DMS)
CFR
CFS, (MFS)
CFR, CMR, (EFR, EMR)
CSU, (EFU, ESU)
CSS
CMU, CMR, (EMR)
CMU, (NMU)
CMR, CMU, (EMR)
CMS
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### Preschool-Elementary Ed.

#### Materials

- Arithmetic Readiness
- Understanding Our Feelings
- Discovering Opposites
- Door Locks
- Flannel Board Aids
- Pick Pairs (see box lid)
- Beginners Number Poster Cards
- Wood Templates
- Rubber Animals
- Cloth Books
- Color and Shapes Matching
- Let's Play Safe
- Number Tree and Pegs
- Color, Squares, and Shapes
- Food Cards
- Matching Color & Shapes
- Abacus Board
- Large Cardboard Coins
- Small Felt Letters
- Laminated Math Cards (Measurement, Money, Etc.)
- Clock Flash Cards
- Spalding Phonograms
- Plastic Alphabet Squares
- Functional Sign Cards
- Measures (Gal., Qt., Pt.)
- Alphabet Practice Cards (Lower Manuscript)
- Measuring Cups
- Checkers
- Uncle Wiggly Game
- Kitchen Bingo
- Foodland
- Handmade Cut-Outs (Kitchen Utensils, Foods, Cleaners)

#### Code

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### Additional uncoded items are listed below:

- Ideal Parker Brothers
- Leisure Learning
- Creative Teaching Associates

- Visual Closure Cards
- Boggle (Hidden Word Game)
- Grapple (Scrambled Word Game)
- Fraction
- Attribute Dominos
Cognition Activities

Activities for the cognition factor are presented on the following pages. The letters (code) in the upper right-hand corner correspond to the Cognition Activities Grid presented in the introduction of the Cognition section.

Answers to activity puzzles are presented at the end of the activities.
1. OBSERVATION

Look at the figure on the left-hand side. Now see if you can find that figure hidden in the drawings on the right.

Circle the figures you think hide the original figure.

![Illustrations of figures](image)

2. PICTURE THIS

Below are some objects with their details missing. Can you name what these objects are?

![Illustrations of objects](image)
I. IDENTIFY AND MATCH

Look at the figures in the left, then circle the one that matches it.

A. B. C. D. E.

CLASSIFY

Two figures in each row are exactly alike. Put a check by these figures.

b. d. e. f.

a. b. c. d. e. f.

a. b. c. d. e. f.
5. PATTERN:
Complete the patterns below:

- [Drawing of pattern]
- [Drawing of pattern]
- [Drawing of pattern]
- [Drawing of pattern]

6. REVERSE
The top figure on the left is the reverse of the right drawing. Draw the reverse of each drawing.

- [Drawing of reverse pattern]
- [Drawing of reverse pattern]
7. **ROTATION**

Examine each pair of dice. If you think the first die can be turned into the position of the cube opposite, put a check.

![Dice pairs with check marks indicating rotation possibilities.](image)

8. **VISUALIZE**

Circle the strings that would make a knot if the ends were pulled.

![Various string diagrams labeled A to E.](image)

9. **ANALOGY**

Which figure on the right completes the relationship you see on the left?

![Relationships between left and right figures.](image)
10. INDUCTING

Look at the series on the left, then draw what could come next.

\[ [\text{Diagram}] \]

11. MEMORY

Study these shapes for two minutes. On a separate paper draw as many as you remember.

\[ [\text{Diagram}] \]
SHARPENING YOUR SENSES

An important part of brain exercising is using all of your senses. Most people don't. It's another example of not using what you have. Problem solvers need all the help they can find.

Try to imagine the things listed below. You can rate yourself on each one: easy, hard, can't do it at all.

Imagine the taste of peanuts.
Imagine the smell of gasoline.
Imagine the sound of a car starting.
Imagine the feel of swinging high on a swing.
Imagine the taste of a banana.
Imagine the smell of toothpaste.
Imagine the sound of a dropped book hitting the floor.
Imagine the feel of biting into an apple.

On with more complicated "imagine" exercises.

Imagine the taste of chocolate ice cream changing into the taste of a piece of orange.
Imagine the feel of hopping on one foot changing into the feel of skipping.
Imagine the smell of bread toasting changing into the smell of peanut butter.
Imagine the sound of a friend laughing changing into the sound of a baseball bat hitting the ball.
You need:

- Magazines
- Scissors
- Paste
- Large sheet of paper

Find and cut out pictures of foods.

Group and paste in groups according to classifications of your choice. You might choose:

- Salty
- Sweet
- Bitter
- Sour

**Foods I Like**
**My Favorite Foods**

**Foods I've Never Tasted**

**Foods I Do Not Like**
Materials:

41 domino cards (See following pages.)

Activity:

Three to four students may play.

Cards are placed face down on table.

Each player draws 5 cards.

One player begins by placing one of her/his dominoes face up on the table.

The next player on the right must match either end of that domino card, pass, or draw one from the pack.

As long as the player can match an end s/he may have another turn, or draw from the pack, or pass.

First player who gets rid of all her/his cards wins the game.
HOW TO CREATE AN ILLUSION

We all need to be aware of how we can be deceived by what we see. Artists, designers, engineers, and other people are aware of this and use this factor in their work. By becoming familiar with optical illusions, we can also learn to understand our surroundings.

Some types of optical illusions are listed below:

1. A vertical line appears to be longer than a horizontal one.
2. Figures left open appear to be larger than an equal figure completely closed.
3. Drawings of a three-dimensional figure on a flat surface seem to change.
4. Placing one figure behind the other or drawing with depth makes equal figures seem unequal.
5. Surrounding lines or figures make other lines or figures appear distorted.
7. The distance between interrupted parts of a drawing seems to shrink.
8. Widgets, continuous boxes, and so on.

Try to design a sample of each type. Then, create a picture or design of optical illusions.
"Sometimes it's

Color this page to make two different pictures.

sometimes it's

sometimes it's
Which puzzle piece can be moved over the dark puzzle piece by sliding or turning it only? (The piece cannot be flipped over.)
If you flip or reflect a shape, this gives a mirror image of the shape. Three samples of shapes and their mirror images are shown below. Can you draw in the other nine?
Cut out 6 squares and form two squares.
PUZZLE DESIGNS

Use these designs to make your own puzzles. Color the shapes and cut. Exchange puzzle pieces with a friend.
Circle the letters beneath the two puzzle pieces that would complete the rectangle. The piece may be turned but not flipped.
OPTICAL ILLUSION

Which center circle is bigger, A or B? Measure to find out. Which looks bigger? Why?
1. Using only one shape how many different designs can you make?

2. Using these shapes can you reproduce your original shape in a larger size?

3. Combine the various shapes and create new designs. Trace the outline of your designs on paper.

4. Follow the directions on the following pages for rearranging shapes.
WITH

MAKE
WITH

MAKE

CFT-1
(Cont.)
WITH

MAKE

CFT-1
(Cont.)
WITH

MAKE

Ω.)
MAKE (Cont.)

\[ \text{Diagram of shapes:} \]

- Trapezoid
- Pentagon
- Hexagon
- Parallelogram
Objectives

Development of group-working skills in problem-solving, development of group awareness, and better acquaintance among group members.

Directions

1. A group of five people works at a time. There is to be no talking or other direction of one person by another. Each person receives three puzzle pieces and the group task is to put together five squares (6" x 6"), one in front of each person. (See following pages.) The puzzle is not completed until all five squares are complete. Although one person must not take pieces unless they are offered, anyone can give any number of his/her puzzle pieces to anyone else. Players must not ask for pieces they need.

2. After the puzzle is completed, discuss group feelings as a group. Find out how the first person to complete a square felt about it, how the person unable to make a square felt, and so on.

3. Looking on, but not doing the puzzle, other students may act as process observers, looking to see how well the group acted together, who was most unselfish in helping others, who did not help, and so on. Observers participate in the discussion of group techniques and critiquing of the process.

Variations

1. Make two sets of puzzles and have two groups work simultaneously. This is good because players feel it is a game, group against group.

2. Allow the process observers to tag one of the group, changing places with him/her and helping to solve the puzzle.

This puzzle works well if students are sitting on the floor, although sitting around a table works well too. The discussion about group feelings is most important, as well as the conclusions students draw about working in a group.
Form a square from these shapes.

Can you cut this apart and fit it back together?
MAZES

Collect a variety of mazes. Categorize them according to difficulty:

1. Cinchy
2. Tricky
3. Perplexing

Choose a maze and find your way through it. Record the time it took you on a line graph. Go through the maze five times and record the minutes on your graph each time.
HELP THE MOUSE FIND THE CHEESE

START

END
WILL THE DIVER FIND THE TREASURE?
CAN THE CAVE MAN FIND HIS WAY HOME?

START

END
HELP THE GIRL IN RED
APPLE MAZE

Begin at the word START, and see if you can trace a path from the apple to the man's head without crossing any lines.
Bill Stacey is hot on the trail of some bandits. Take your pencil and start in the "G" Car. You must not cross any solid lines. What's the quickest route to the Bandit Hideout?
Sir Arthur Covingham is off on an expedition in Africa. He is looking for the long-lost temple of the Mogjugla tribe. Can you help him find the shrine?

Use your pencil to trace a path from start to temple without crossing any of the lines.
CIRCULAR REASONING

Carol Cashew, mild-mannered secretary for a great metropolitan publishing company (who is in reality Lightfooted Lady, champion of justice and nemesis of evildoers) was on her way to put out a fire sale when she was confronted by a maze built by her arch enemy, the evil Suffering Smyth. Not hesitating, she weaved her way through the maze and arrived at the fire sale in the nick of time. How did she do it?
Start with any letter in the square below, move one square at a time in any
direction until you have spelled out a common English word of four or more
letters. For example, you can start with H in the top row and easily spell
HURL. Do not use proper names; and do not form plurals by adding "s" to three-
letter words. Par on this one is 20 words in 25 minutes. There are at least
29 words hidden in this puzzle. Perhaps you can get more.

```
  C  A  Q  H  S
  B  N  R  U  K
  S  G  V  L  O
  W  T  M  I  P
  Z  Y  E  D  J
```
FIND THE WORDS

Find all possible words within the squares of this puzzle. You may move up, down, sideways or diagonally. The same letter square may be used twice in the same word if another letter is used in between. In the example below, the letter "R" is used in the word "roar", but "O" and "A" are used between.

```
CAMAR
ORNED
ERONE
```

12:3
BREAK THE CODE

In the following story, numbers have been used instead of letters. Each number represents a certain letter. Your task is to break the code and decide what letter each number stands for.

1. Read through the story as much as possible.

2. Choose one number that you can be sure of the letter it replaces. Change that number to the letter in the entire story.

3. Do the same for each number in the story until you have broken the code.

A Trick

One ho5 d3y, 37 w3n5ed 50
173y 3 5264k on h6s f26end, 135.
He offered h6m some 64e-4o7d 7emon3de.
When 135 53s5ed 65, he m3de 3 5e226b7e
f34e. 37 73ughed be43use he h3dn't
pu5 3ny sug32 6n 65. 5h35 w3s 3
123456437 joke.

Break the Code

1. ____________________
2. ____________________
3. ____________________
4. ____________________
5. ____________________
6. ____________________
7. ____________________

Try writing your own story or message using a similar code.
The trellis in the left-hand corner is one of the other eight as seen from the back. Which one?
ATTRIBUTES

Purpose of Lesson

The students will be able to discover similarities and differences among attribute cards.

Materials Needed

Attribute cards. (See following pages.) These designs may be cut out and pasted on cards or the teacher may make a set of cards by drawing similar lines on 3" x 5" cards with a felt pen.

Attributes for Attribute Cards

-Wide and thin lines
-Broken and continuous
-Curved and straight, irregular
-Double and single lines
-Horizontal and vertical

Activities

Discuss the meaning of attributes. Teacher decides on a certain attribute or combination of attributes. Teacher shows cards one at a time, rejecting or accepting each. Students evaluate cards teacher has accepted and determine the attributes.

Variations

The attribute cards could be paired and copied on rectangles of chipboard to make a set of attribute dominoes.

Rules for Attribute Dominoes

Each player draws 10 dominoes. The object is to form the longest possible chain according to some rule of matching. Rules for matching:

1. Dominoes must have ends that match exactly.
2. Ends match except for color.
3. Ends match except for shape.
4. Ends match except for size.
5. Ends match in color only.
6. Ends match in shape only.
7. Ends match in size only.
8. Ends have exactly one difference.
9. Ends have exactly two differences.
10. Ends have three differences.

Note to teacher

There are many good commercially prepared attribute blocks, cards, and dominoes available in educational supply stores.
Find at least 36 words
WORD COLLAGE

You need:

Magazines
Scissors
Paste
Large sheet of poster or construction paper

Select a category of words, for example, nouns, adjectives, or verbs.

Search through the magazines and find examples of your words, the more colorful, the better! Advertisements and titles are especially good sources of large, colorful words.

Cut out words.

Arrange artistically and paste them on the poster paper.
Objective

The student will use descriptive words orally to communicate directions to other students for drawing a given shape.

Materials Needed

5" x 8" cards with pictures or geometric shapes drawn on them. (See next page.)
Pencil and pencils

Activity

1. Discuss how to give directions well so that others understand.

2. Discuss organization of thoughts and how to develop a sequence to the directions.

3. Divide the class into groups of five.

4. Each child in the group will have an opportunity to give directions to the other children in that group.

5. The child who will be giving directions receives a 5" x 8" card with a picture or geometric shape drawn on it. (See next page.) Without showing the rest of the group the student will use only words to explain how to draw the shape. S/He may use only words telling the types of lines to use, the direction the lines are to go, the length of the lines, and the distance between them.

6. The other members of the group draw exactly what they are told. No questions may be asked of the direction-giver.

7. At the end of the instructions, the group compares drawings to the original.

8. Another student then gives directions from another card until each child has a turn.

9. Discuss the problems in communicating effectively and how to remedy the problems.
SUGGESTED FORMS FOR CARDS

These forms can be cut apart and pasted on cards.
Choose a word. Think of the attributes of that word. Draw those attributes into the word.

Fishing

Flag

PIG

Jump

Train

Sleeep
Here are eight simple sayings translated into complicated language. Match them with the original proverbs on the right.

1. A superabundance of talent skilled in the preparation of gastronomic concoctions will impair the quality of a certain potable solution made by immersing a gallinaceous bird in ebullient Adam's ale.

2. Individuals who perform are constrained to be domiciled in vitreous structures of patent fragility should on no account employ petrous formations as projectiles.

3. That prudent avis which matutinally deserts the cosiness of its abode will ensnare a vermiculate creature.

4. Everything that coruscates with effulgence is not aurous.

5. Do not dissipate your competence by hebetudinous prodigality lest you subsequently lament an exiguous inadequacy.

6. An addlepated bonehead and his species devaricate with startling prematurity.

7. It can be no other than a maleficent horizontally propelled current of gaseous matter whose portentous advent is not the harbinger of a modicum of beneficence.

8. One should hyperaesthetically exercise macroscopy upon that situs which one will eventually tenant if one propels oneself into the troposphere.

Discuss: After trying this semantic exercise what conclusions have you reached about the use of words and communication?

Try writing some of your own proverbs or fable tales using big words. You will need a good dictionary!
ANSWERS

CFU-1 CHECK YOUR PERCEPTION

1. The ability to see one pattern within another is necessary to develop original designs and to observe things closely. You should see the basic pattern in numbers 2 and 4. (If a child can explain and diagram number so it fits correctly, give him/her credit.)

2. Perception is an active, pattern-seeking process and is important to the act of thinking. Just as you tried to find a pattern in number 1, here you get "closure." You may be able to supply the missing detail in your mind due to having seen these objects in the past. Your mind completed the closure of an incomplete figure.

Answers: house, violin, tape dispenser, book, camel.

3. The correct answers are: C, D, B

If you could match these correctly, you looked for patterns. If you can do these quickly you have seen the pattern as a whole.

The long way involves detailed comparison and perhaps talking to yourself.

The computer uses this method and is a slow visual thinker. A computer takes great effort to perform operations that humans can perform effortlessly.

4. This operation is more difficult because it establishes categories for separating items. A computer must be programmed to gain the ability to classify, but this is a routine matter for the human mind. How easy was it for you?

Answers: a and e, a and e, c and f

5. Activities involving drawing show how actively you seek patterns. To draw the required image your mind and eyes have to work together to "see" it correctly.

6. Rotating objects in your mind is more difficult. You have to use imagination and base it on what you see.

7. A three-dimensional object is even harder. You have more areas to think about and consider.

If you checked the first pair of dice, you rotated the dice correctly.

8. You had to move a piece of string in space in your mind. This is very difficult and requires you to form the image in your mind.

Answer: The knots are B, C, E

9. Logical reasoning can use visual thinking as much as verbal or mathematical thinking. Putting objects together from an idea presented is used by the artist and inventors to create new ideas.

To answer correctly, you should have: D and C
10. Picturing images can become more complicated as in this activity. Based on a pattern of what you have seen, you are asked to visualize what would come next.

The answers are:

11. The ability to remember what you have seen is hard to measure. A poor memory may be the result of inaccurate perception. In fact, active perception and a faithful memory are closely tied together. The more actively you perceived these figures the better you remembered them.

CFS-3 MATCHING SHAPES

Row 1--A
Row 2--C
Row 3--C
Row 4--A
Row 5--B

CFS-4 MIRROR IMAGES

CFS-7 PUZZLE PIECES

Row 1--B and D
Row 2--A and C
Row 3--A and E or B and C
Row 4--C and E
Row 5--B and D
Row 6--A and E
Row 7--A and C
<table>
<thead>
<tr>
<th>CSS ATTRIBUTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Wide, double, vertical</td>
</tr>
<tr>
<td>2. Wide, thin, curved, double</td>
</tr>
<tr>
<td>3. Broken, straight, thin, single horizontal</td>
</tr>
<tr>
<td>4. Broken, straight, double, wide, horizontal</td>
</tr>
<tr>
<td>5. Double, wide, vertical, broken</td>
</tr>
<tr>
<td>6. Thin, wide, double, horizontal</td>
</tr>
<tr>
<td>7. Wide, broken, irregular, single</td>
</tr>
<tr>
<td>8. Single, thin, wide, vertical continuous</td>
</tr>
<tr>
<td>9. Thin, vertical, continuous, single</td>
</tr>
<tr>
<td>10. Irregular, thin, wide, double broken</td>
</tr>
<tr>
<td>11. Curved, wide, single</td>
</tr>
<tr>
<td>12. Vertical, single broken, wide, straight</td>
</tr>
<tr>
<td>13. Thin, wide, horizontal, broken, single straight</td>
</tr>
<tr>
<td>14. Thin, wide, irregular, double, continuous</td>
</tr>
<tr>
<td>15. Double, wide, thin, horizontal straight, broken</td>
</tr>
<tr>
<td>16. Irregular, thin, single, continuous</td>
</tr>
<tr>
<td>17. Double, thin, irregular continuous</td>
</tr>
<tr>
<td>18. Double, wide, irregular, continuous</td>
</tr>
<tr>
<td>19. Thin, wide, double, broken, curved</td>
</tr>
<tr>
<td>20. Thin, straight, vertical, double, continuous</td>
</tr>
<tr>
<td>21. Broken, double, thin, irregular</td>
</tr>
<tr>
<td>22. Thin, horizontal, straight, single, continuous</td>
</tr>
<tr>
<td>23. Wide, thin, single, irregular, continuous</td>
</tr>
<tr>
<td>24. Wide, single, irregular, continuous</td>
</tr>
</tbody>
</table>
CSR-1  BREAK THE CODE

1--p
2--r
3--a
4--c
5--t
6--i
7--l

CMT-2 MOUNTAINS OUT OF MOLEHILLS

1--d
2--g
3--a
4--f
5--c
6--b
7--h
8--e
Task cards created for use with the cognition factor are presented on the following pages. Answers for two of the puzzles are presented at the end of the section.

The task cards have also been printed on a heavier stock and sets (Stock No. 41-S-9941) may be ordered through the Office of Materials Development, telephone 293-8140.
COGNITION WALK*

Leave the confines of the classroom to take a cognition walk. Keep your senses alert and be keen observers. Maybe you can arrange to go in small groups. Discuss and name all the things you see and hear, as well as what you can touch, taste, or smell.

When you return to the classroom you may want to discuss, write about, or draw pictures of your walk.

*A good activity to introduce and discuss the concept of cognition.
ALPHABET SOUP

Materials Needed

Alphabet macaroni (at least 1 teaspoon per student)
Toothpicks (optional, helpful for separating the letters)

Activity

Students are given one teaspoonful of alphabet macaroni. They are given a time limit (5-15 minutes) to make as many words as they can from the macaroni.

Variations

"Begging time" can be called by the teacher for five minutes, and students can ask others for letters they need. "Begging time" is ended by the teacher. Students have five more minutes to finish their lists of words. Point values can be assigned for three-letter words, four-letter words, and so on. The students total their accumulated points to determine a winner.

Students may practice making words from macaroni as an independent activity.

Play the game again but place the words in a crossword puzzle form.

Student can use macaroni letters to "write" original poems on wooden plaques or on cardboard. (Letters are glued on, then covered with shellac or varnish.)

(This activity is coded CSU.)
FOR YOU TO TRY

Try one or more of the things below. Give a brief report to your class or teacher on how it came out. Feel free to suggest your own ideas to your teacher.

1. Take a walk and list at least 10 sounds, sights, or smells you never noticed before. On your way to school, try going a different way, or go the same way and try to find something you've never noticed before.

2. Ask your mother to let you prepare a new dish for supper—something no one in your family has tried before.

3. Get a committee to prepare a bulletin board on unusual ideas. (If you like to work alone, prepare a notebook instead.)

4. Tape record some unusual sounds. Ask your classmates to identify them. Or record common sounds and play them at different speeds.

5. Report to the class on a new idea you have found helpful at home or at school.
TRACE AND ERASE

The object of the game is for one player to "erase" all four words of his/her opponent, and then tell his/her opponent the words which he/she managed to "erase."

Two players may participate. Each player has a board on which are two squares with 100 boxes. The boxes are numbered on top from 1 to 10. The letters A–J run down between the two squares, one letter alongside each box. In this way you can designate the position of any box. For example if you call G–4, that means the seventh box down and the fourth box in.

When the game starts, each player has exactly the same diagram. S/He marks the left-hand square "My Chalkboard" and the other square "Opponent's Chalkboard."

Each player starts with a chalkboard on which s/he has placed four words in any place or any position, vertically, diagonally, or straight across. S/He must decide on one four-letter word, one three-letter word, and two two-letter words. The only two restrictions are that no word may touch another word. Each word must be separated by one blank box, and only one letter may appear for each box. (The example shows how you can position your words and also keep track of the boxes you called from your opponent's chalkboard.)

The players sit opposite each other with the stand in between them so that they cannot see each other's charts. Once the words are placed the game starts.

The idea of the game is to try to erase your opponent's chalkboard completely and guess the words s/he has used. If you call out a box on which your opponent's word is placed, you make an erasure. But one erasure is not enough to erase the whole word. You must hit every box on which that word is positioned.

The game starts with the first player calling out four different boxes. As s/he calls each one, s/he marks the call on her/his own "Opponent's Chalkboard." Looking at the example; the first player has called out I-3, D-4, E-5, and B-8. After s/he completes the full call, her/his opponent reports if any erasure has been made and if so what length of word s/he hit, and the name of the letter. For example, her/his opponent must report "no erasure" or "one erasure" on a four-letter word, and the letter is D.

The other player then gets a turn. S/He too records calls on her/his "Opponent's Chalkboard." The first player records all her/his opponent's erasures on her/ his own chart and tells opponent what erasures have been made.

The example indicates that the second player has called A-3, B-3, C-3, and D-3 and has made an erasure on the first player's four-letter word.

Play proceeds in this manner with each player keeping a record of every call made by her/himself and opponent. In this way each player learns where opponents words are located.
After a player loses an entire word s/he is entitled then to only three calls on each turn thereafter. In the same way, any time a player loses a word her/his calls are reduced by one. When either player succeeds in erasing and guessing all four of her/his opponent's words, s/he wins the game.
FINGER PRINTING

Materials Needed

Stamp pad
Copy of the finger printing card
Magnifying glass

Directions

Fill out your own finger printing form. You might want to use your imagination in filling out parts of the form; for example, aliases. After your prints are made, classify your prints according to type.

Additional Activities

If you can obtain some finger printing dust and a brush you might try to solve a pretend "WHODUNIT"!

After a group has completed finger print forms, put some prints on blank cards. Identify the prints by using the forms.
FINGER PRINTING FORM

LEAVE THIS SPACE BLANK

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<tr>
<th>FBI No.</th>
<th>C.I.I. No.</th>
<th>LAST NAME</th>
<th>FIRST NAME</th>
<th>MIDDLE NAME</th>
<th>SEX</th>
<th>RACE</th>
<th>AGE</th>
<th>HT.</th>
<th>WT.</th>
<th>MT.</th>
<th>HM.</th>
<th>IN.</th>
<th>WT.</th>
<th>DATE OF BIRTH</th>
<th>HAIR</th>
<th>EYES</th>
</tr>
</thead>
</table>

SIGNATURE OF PERSON FINGERPRINTED

REPRESENTATIVE OF PERSON FINGERPRINTED

OCCUPATION

SIGNATURE OF OFFICIAL TAKING FINGERPRINTS

DATE

SIGNED DATE

RIGHT THUMB

RIGHT INDEX

RIGHT MIDDLE

RIGHT RING

RIGHT LITTLE

LEFT THUMB

LEFT INDEX

LEFT MIDDLE

LEFT RING

LEFT LITTLE

LEFT FOUR FINGERS TAKEN SIMULTANEOUSLY

RIGHT FOUR FINGERS TAKEN SIMULTANEOUSLY

STATE BUREAU OF IDENTIFICATION
SACRAMENTO, CALIFORNIA
SAY IT WITH
SYMBOLS

The signs along our highways give directions to drivers. A good symbol should enable the driver to recognize its meaning instantly. Design a symbol for each message below.

Bumpy Road

Narrow Bridge

Steep Hill

Animal Crossing

Slippery Road

Railroad Crossing
1. Select a category, e.g., football, traffic directions, air traffic controller, and so on.

2. Design different hand signals that would indicate a command, phrase, or saying within that category.
FAVORITE QUOTE

Materials Needed

A book of famous quotations
Poster paper
Crayons, colored pencils, felt pens, etc.

Activity

Choose a favorite famous quotation and make a poster which illustrates the quotation. Examples: "If you can’t stand the heat, get out of the kitchen." Or "The buck stops here." (Harry Truman) Or other famous quotes.
Declare a "No Talking Day." Give each participant "The Great I'm a Non-Talker Memo Book." Players may communicate only by writing. Each non-talker will receive a set of small prizes: points, chips, and so on. If someone hears a player talking, he/she may take one of the talker's prizes! The game may be made more complicated by adding additional rules, e.g., if a spelling or punctuation error is found the player must forfeit another prize!

No talking at recess!
THE FLY'S TOUR

The student will need many dittoed copies of this chessboard, or cover it with acetate. It may take many attempts to solve this problem.

A fly landed on the square in the top left hand corner of a chessboard and then proceeded to visit every white square. It did this without ever entering a black square or ever passing through the same intersection more than once. Can you show its route? It can be done in 17 continuous straight courses.
TOOTHPICK TEASER

Material Needed
Toothpicks (24)

Directions
Arrange them in the position as shown. Remove 8 toothpicks to create two squares of unequal size.

(In this activity the process of actually manipulating the toothpicks until you perceive the solution is important.)

TOP SECRET! When you discover the solution, do not tell. Allow your classmates the thrill of discovering it themselves!
WHEN IS A HOUSE NOT A HOUSE?

Materials Needed

Paper
Crayons
A partner

Directions

In this activity you must depend only upon verbal communication!

Sit back-to-back with your partner. Each of you will need crayons and paper. Begin to draw a picture (or design). Describe it to your partner. With each additional item you add to your picture, continue to describe it to your partner. Your partner may ask questions about size, shape, and color, but only questions that can be answered "Yes" or "No."

When you finish, compare. What features were communicated accurately? Were there some misunderstandings?

Discuss ways of describing features more precisely.

This activity could lead to a deeper discussion of problems in communication. Relate experiences when you were misunderstood or when you didn't understand someone. What was the cause of the problem? What did you do?
Find all 26 letters of the alphabet in this all-in-one. You will need to study it from every direction to find them all.

Try making your own all-in-one.
Materials Needed

Colored cellophane
Tagboard
Scissors
Paste

Activity

Here is a way to rediscover a familiar environment. Create a flamboyant pair of eye glasses with cellophane and tagboard.

Take a cognitive walk and rediscover your environment.

Think divergently on this comprehension activity and experiment with blending the colors.
INTRODUCTION

Code - M    Color - Blue

Memory is the retention or storage with some degree of availability of information. Memory is essential to academic success and is one of the easiest of the operations to develop. There are many fun activities and interesting tasks available which will motivate students to improve their memory. Many commercially made games are available which can enhance memory training.

It is important during memory lessons to encourage the students to discuss how they remembered things. Did they repeat a concept over and over (repetition), did they close their eyes and picture it, did they make associations? By encouraging this informal analysis students become aware of the different memory systems, try them and, hopefully, discover the systems that work best for them. Many mnemonic devices can be taught. Excellent books (many in paperback) are available on memory training. These are excellent sources of information for both the teacher and student.

Have fun with these lessons.

GLOSSARY FOR SOI FACTOR DEFINITIONS IN MEMORY
(WISC-R Analysis)

MFU - Recalls materials learned by visual and auditory presentation
MFS - Recalls arrangement of objects previously presented
MFT - Memory for transformations of figural material previously changed
MSU - Recalls for immediate production after one presentation a series of numerals or letters
MSS - Memory for a system of numerals, symbols, or letters
MSI - Memory for well-practiced number operations

MMU - Reproduces previously presented ideas or words studied
MMR - Remembers meaningful pairs of words
MMS - Remembers order of materials or events presented visually or auditorially

*The memory section does not have an answer section.
<table>
<thead>
<tr>
<th></th>
<th>F</th>
<th>S</th>
<th>M</th>
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<tbody>
<tr>
<td>U</td>
<td>MFU</td>
<td>MSU</td>
<td>MMU</td>
</tr>
<tr>
<td></td>
<td>Memory of Objects Presented</td>
<td>Morse Code</td>
<td>Memory of Words</td>
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<td></td>
<td>Map Memory</td>
<td>Memory for Letters</td>
<td>Flash Cards</td>
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<td>Digit Recall</td>
<td>Definitions</td>
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<td>C</td>
<td>MFC</td>
<td>MSC</td>
<td>MMC</td>
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<td>Memory for Classes</td>
<td>Memory of Word Classification</td>
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<td>Memory of Number Classes Presented</td>
<td>Presented and Removed</td>
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<td>MFR</td>
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<td>MMR</td>
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<td>Study and Recall, Positions</td>
<td>Memory of Letter Series</td>
<td>Antonyms</td>
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<td>Memory of Names</td>
<td>Analogies Presented</td>
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<td></td>
<td>Memory of Paired Figures</td>
<td>Memory of Words/Numbers</td>
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<td>Any Mnemonic System</td>
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<td>MSS</td>
<td>MMS</td>
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<td></td>
<td>Memory of Positions</td>
<td>Digits Backward Recall</td>
<td>Following Directions</td>
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<td></td>
<td>Memory of Sequential Positions</td>
<td>Nonsense Words</td>
<td>Calendar</td>
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<tr>
<td></td>
<td>Memory of Dances</td>
<td>Memory for Musical Notes</td>
<td>Gossip Game</td>
</tr>
<tr>
<td></td>
<td>Memory of Positions (Blocks, Page, Designs)</td>
<td></td>
<td>Days of the Week</td>
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<tr>
<td>T</td>
<td>MFT</td>
<td>MST</td>
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<td>Memory of Block Patterns</td>
<td>Misspelled Words</td>
<td>Homonyms</td>
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<td>Memory of Paper Folding</td>
<td>Word Transformations</td>
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<td>Memory of Picture Rotations</td>
<td>Number Reversals</td>
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<td></td>
<td>Object Recall</td>
<td>Multiplication Tables</td>
<td>Memory for Implications</td>
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<td>Figure Recall</td>
<td>Addition and Subtraction Facts</td>
<td>Connections Between Elementary Inferences</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Match Job Descriptions with Characters in a book</td>
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COMMERCIAL PREPARED MATERIALS

Many of the commercially prepared educational materials can be used to supplement the activities and materials developed for SOI operations. The following list presents materials which have been coded for the memory operation. In some cases, it was found that the materials could be used for several different cells in the SOI model and were coded accordingly. Additional cells (codes) are indicated in parentheses.

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<thead>
<tr>
<th>Company</th>
<th>Materials</th>
<th>Code</th>
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<tr>
<td>Instructo</td>
<td>Language Concepts in Song Color Pattern Board</td>
<td>MMU, MFU, MFS (CFR, CPS, NFS, CFU)</td>
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<tr>
<td></td>
<td>Sort-a-Card</td>
<td>MFC, MFR (CFC, NFC)</td>
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<td></td>
<td>Flannel Board Story Kits</td>
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<td>Peg Board Sets</td>
<td>MFU</td>
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<td></td>
<td>Magnetic Numerals</td>
<td>MSS, MMS (CSU)</td>
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<td>Number Names &amp; Symbols</td>
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<td>Colored Blocks in Squares</td>
<td>MFU, MFR (CFS, CRF)</td>
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<td>Colored Stringing Shapes</td>
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<tr>
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<td>Design Cards, Colored Cubes</td>
<td>MFU, MFR (NFR, NFS)</td>
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<td>Parquetry</td>
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<td>Milton Bradley</td>
<td>Musical Instruments</td>
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<td>Beads and Laces</td>
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<td>Perceptual Development Cards</td>
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<td>Classification Charts</td>
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BOOKS

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<tr>
<td>The Memory Book</td>
<td>Harry Lorayne and Jerry Lucas</td>
<td>Ballantine Books</td>
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<tr>
<td>How To Develop an Exceptional Memory</td>
<td>Morris N. Young, M.D. and Walter B. Gibson</td>
<td>Wilshire Book Co.</td>
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<tr>
<td>Mem-O-Spell</td>
<td></td>
<td>Leisure Learning</td>
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<tr>
<td>Kombi, The Exciting Memory Game</td>
<td></td>
<td>Playing Card Co., D-7022 Leinfelden/Stuttgart, Western Germany</td>
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<tr>
<td>Memory--Card Matching Game</td>
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<td>Milton Bradley</td>
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MEMORY ACTIVITIES

Activities for the memory factor are presented on the following pages. The letters (code) in the upper right-hand corner correspond to the Memory Activities Grid presented in the Introduction to the Memory section.
MISSING PERSON

For this game you will need a group of ten* students.

Be sure everyone knows all the names of the others in the group. (This can also be a memory activity!)

Choose one person to be "it." "It" leaves the room. Another person is chosen to hide in the closet. The remaining students scramble—change seats. (With very young students this scrambling may be omitted.)

"It" returns to the room and tries to name the missing person.

Increase the number of participants to make the game more challenging.

*The number may vary depending upon the ability of the students.
REMEMBER AND DRAW

Cut cards apart. Show to students. Students study cards then reproduce on blank paper from memory. Through continued practice students should increase ability to reproduce figures from memory and decrease the time in copying the figures.
HOW GOOD A WITNESS WOULD YOU BE?

Duplicate for students or make a transparency. Allow three to five minutes for study. Answer questions. (See next page.) Allow students to correct their answers by again seeing the picture.
HOW GOOD A WITNESS WOULD YOU BE?

Questions for Memory

1. Is anyone riding a tricycle?
2. Is anyone playing ball?
3. Did anyone buy a pinwheel?
4. How many baby carriages are there?
5. How many sliding chutes are there?
6. Is there a policeman in the picture?
7. Did anyone reach the top of the jungle gym?
8. Is anyone using the seesaw?
9. Was there a boy or girl on the swing?
10. How many balloons did the ice cream man have?
11. How many children are playing in the sand pit?
12. Does the ice cream man have a moustache?
13. Is there a swing in the picture?
14. Did anyone buy a balloon?
15. How many benches are there?
16. How many ladies are there?
17. Does anyone have a pail and shovel?
18. Is the ice cream man driving a truck?
19. Is there a wading pool in the picture?
20. Is anyone running?
Duplicate for each student and cut into strips. Students study each strip in turn and reproduce it on paper from memory. After finishing all strips, students check. Discuss memory systems used.

1.

2.

3.

4.

5.

6.

7.
ARE YOU A GOOD WITNESS?

Study this scene for three minutes. Then answer the questions on the next page.

Additional Activity

A good follow-up activity is to repeat this activity the next day. Discuss why it was so much easier to remember when you know what questions would be asked. What does this tell us about memory activities?
ARE YOU A GOOD WITNESS?

Questions for Memory

1. What was the name of the town? ____________________________________________
2. What time of day was it? ________________________________________________
3. What day of the week? _________________________________________________
4. What season of the year? _______________________________________________
5. Was the automobile a closed car? _________________________________________
6. What was its license number? ____________________________________________
7. What direction was it going? _____________________________________________
8. Did the driver have a hat or cap? _________________________________________
9. Was the boy bareheaded? _______________________________________________
10. Which way was the trolley going? ________________________________________
11. What was its number? _________________________________________________
12. How many people were in it? ____________________________________________
13. How many others saw the accident? _______________________________________
15. On which street was the grocery? _________________________________________
16. Who owned it? _________________________________________________________
17. On what street was the hardware store? _________________________________
18. What was its name? ____________________________________________________
19. What was in the window with the clock? _________________________________
20. Was there a mailbox on the corner? ______________________________________
21. How many children were visible? _________________________________________
22. How many animals were shown? _________________________________________
23. Was the man in the window bareheaded? _________________________________
24. Who had the right of way? _____________________________________________
25. What was the price of bananas? _________________________________________
FUNNY FACE

Make a transparency of this funny face. Show to students, using an overhead projector. Rotate face to show both smiling and angry faces. Remove faces; ask students to draw them from memory. Allow students to check themselves by again projecting face.

Discuss memory systems used.
TELEPHONE DIAL

Everyone uses the telephone and most of us use dial phones. Can you fill in the correct letters and numbers in this dial?

U.S. MONEY

Every day we see the same objects over and over again. Day in and day out, week in and week out, we are always looking at certain standard things yet we fail to observe them. How many questions can you answer correctly about the one-dollar bill or the five-dollar bill?

1. Which way is Washington facing?
   a. to your right  
   b. to your left  
   c. neither

2. Which way is Lincoln facing on the five-dollar bill
   a. to your right  
   b. to your left  
   c. neither

3. How many times does the figure 1 appear on the dollar bill?
   4  8  9  12  16

4. Where are the numbers of the bills located?
   a. upper right section  
   b. upper left section  
   c. lower right section  
   d. lower left section

5. How many times does the word One appear on the dollar bill?
   4  8  9  10  11  12  16

6. Who is the treasurer of the United States?

7. What is pictured on the back of the five-dollar bill?

8. How many times does the word Five appear on the five-dollar bill?
   4  8  9  11  16  20
Materials Needed

- Mazes 1, 2, and 3
- Pencil
- Learning Graph

Activity

Students work with a partner. One student traces a path through a maze with a pencil while the partner records the number of trials (the number of times he/she starts over) and the number of errors made. This information is entered on the learning graph. Different colored pencils may be used to record the data from the three different mazes. This activity may be repeated to measure memory. Using different mazes or after waiting several days, have the student switch activities.

Discuss with Students

- The importance of making mistakes in learning something new.
- How the mind uses errors to reinforce the knowledge it considers to be correct.
- The trial-and-error method of learning.
Find the route from Dover, England to Calais, France.
MAZE 2

Start at the bullpen and find a way out.
MAZE 3

Start in the bull's-eye and find a route to the outside.
MATCHING DESIGNS

Hold up a study card, one at a time, for three to five seconds. Students reproduce the designs indicated by the arrow on the cards and match them to the correct design below.
STUDY CARDS

MFI-4
(Cont.)
MEMORY OF NONSENSE WORDS

Study Page

Study this list of nonsense words for 60 seconds. You will be required to identify these words from a list of many.

<table>
<thead>
<tr>
<th>erl</th>
<th>ow</th>
<th>eil</th>
<th>roz</th>
<th>moz</th>
</tr>
</thead>
<tbody>
<tr>
<td>wiz</td>
<td>tep.</td>
<td>tem</td>
<td>gub</td>
<td>tel</td>
</tr>
<tr>
<td>toz</td>
<td>zew</td>
<td>gib</td>
<td>eol</td>
<td>gob</td>
</tr>
</tbody>
</table>

Test Page

Mark in the "Yes" column those words studied.

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th></th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>zpw</td>
<td></td>
<td></td>
<td>roz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>tel</td>
<td></td>
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<td>ziw</td>
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<tr>
<td>zew</td>
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<td>eil</td>
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<td></td>
<td>geb</td>
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<tr>
<td>tep</td>
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<td>gib</td>
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<tr>
<td>zaw</td>
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<td>eol</td>
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<td>tem</td>
<td></td>
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<td>gob</td>
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</tr>
<tr>
<td>eal</td>
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<td></td>
<td>tel</td>
<td></td>
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</tr>
<tr>
<td>gub</td>
<td></td>
<td></td>
<td>ziw</td>
<td></td>
<td></td>
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<tr>
<td>foż</td>
<td></td>
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<td>tex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>goz</td>
<td></td>
<td></td>
<td>moz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>zew</td>
<td></td>
<td></td>
<td>zow</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Optional activity: Let the students take the study page home. Test the next day.
COLOR THE NUMBERS

Study Page

Color the numbers. The same numbers must be the same color.

5 5 5
2 2 2
8 8 8
4 4 4

7 3 1 6
7 3 1 6
7 3 1 6

Additional study pages may be made
COLOR THE NUMBERS

Test Page

Color the numbers, each with different colors. Some of the numbers must be the same as those on the study page. (This test sheet may be used many times by placing it in an acetate sleeve. The students mark on the acetate with a grease pencil.)

5 2 1 2
4 5 8 3
3 6 5 7
1 8 9 6
9 7 4 8

Study the study page for 60 seconds. The numbers are grouped together because they have two things in common (color and number). You are to remember both. Circle all the numbers on the test page that would belong to the groups on the test page studied.
IMPROVING MEMORY

Objective of lesson: The student will become aware of how symbolic memory can be trained to improve its use.

Write these letters on the chalkboard:

UIETSS NTD TAE

Have students study these letters until they think they have them memorized (about two minutes).

Ask students to recall and/or write the letters. Discuss how much they remembered and how they went about memorizing the letters.

Discuss the possibility of rearranging the letters to make memorization easier.

(At this point the students may have discovered what the letters spell. Let them share if they have.)

Write UNITED STATES on the chalkboard.

Discuss which would be easier to memorize. How can this method be applied to memorization tasks?

Share examples of how to organize information to be memorized in a meaningful order:

Great Lakes: HOMES--Huron, Ontario, Michigan, Erie, Superior--picture homes around the lakes.

Music staff: E, G, B, D, F--Every good boy does fine.

Spell the word piece: Think of the phrase "a piece of pie."

Voices in a quartet: Picture a quartet being stabbed!--s t a b--soprano, tenor, alto, bass

Ask the students to share memory tricks they know.
EYES AND EARS

Which is stronger, your visual memory or your auditory memory?

Discuss the ways in which we receive information to be stored in our memory:

- The two main senses we use, vision and hearing.
- The fact that some people remember what they see better (visual memory), and some people remember better what they hear (auditory memory).

Activity

1. Distribute lined paper. Have students number from 1-15.

2. Read a series of numbers (beginning with three digits progressing to eight digits).

   After the last digit is read, the student write the numbers in the order in which they were read.

3. After the last number series is read the students correct each series as they are repeated.

Repeat this exercise, only present the number series on flashcards.

This activity may be done by the teacher or the students may work with a partner to present numbers to each other.
**CARD SET A**  
(For first student in pair)

1.  4 - 0 - 7  
2.  7 - 3 - 1  
3.  2 - 0 - 7 - 5  
4.  9 - 2 - 1 - 6  
5.  3 - 1 - 6 - 2 - 5  
6.  2 - 9 - 1 - 6 - 3  
7.  1 - 0 - 9 - 4 - 5  
8.  6 - 2 - 5 - 8 - 9 - 7  
9.  1 - 0 - 3 - 9 - 7 - 9  
10.  3 - 9 - 2 - 9 - 6 - 3  
11.  5 - 0 - 6 - 2 - 4 - 1 - 4  
12.  2 - 8 - 6 - 4 - 5 - 3 - 1  
13.  4 - 3 - 2 - 9 - 6 - 1 - 7  
14.  8 - 2 - 6 - 1 - 9 - 4 - 3 - 0  
15.  5 - 9 - 8 - 7 - 3 - 6 - 4 - 1

**CARD SET B**  
(For other student in pair)

1.  3 - 2 - 6  
2.  6 - 9 - 5  
3.  4 - 6 - 1 - 8  
4.  8 - 5 - 6 - 7  
5.  9 - 4 - 6 - 2 - 3  
6.  3 - 0 - 5 - 6 - 9  
7.  4 - 8 - 9 - 5 - 1  
8.  7 - 3 - 1 - 4 - 8 - 6  
9.  2 - 8 - 0 - 1 - 5 - 2  
10.  7 - 6 - 4 - 6 - 9 - 8  
11.  5 - 2 - 9 - 1 - 7 - 8 - 3  
12.  1 - 8 - 7 - 6 - 2 - 9 - 4  
13.  8 - 1 - 7 - 5 - 2 - 3 - 9  
14.  6 - 1 - 9 - 4 - 3 - 7 - 8 - 5  
15.  1 - 2 - 6 - 5 - 9 - 4 - 3 - 0
Study this diagram for one minute.

```
F P Y B
Z H K C
L V D W
```
MEMORY FOR SYMBOLS

Try to put the correct letters into the squares.
The student is to remember a transformation in a series of numbers. The transformation consists of, for example, reversals in number series, exchange of first or second pairs, or first and last number shifts. Presented with the test page, the student is required to select the transformed numbers.

<table>
<thead>
<tr>
<th>Study Page 1</th>
<th>Study Page 2</th>
<th>Study Page 3</th>
<th>Study Page 4</th>
<th>Study Page 5</th>
<th>Study Page 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>145 - 541</td>
<td>6781 - 7481</td>
<td>9542 - 5924</td>
<td>2186 - 6182</td>
<td>5678 - 7856</td>
<td>9514 - 4519</td>
</tr>
<tr>
<td>293 - 239</td>
<td>6932 - 6973</td>
<td>8736 - 6378</td>
<td>7934 - 4397</td>
<td>9312 - 1293</td>
<td>8765 - 7856</td>
</tr>
<tr>
<td>679 - 769</td>
<td>8054 - 0845</td>
<td>0123 - 3210</td>
<td>5273 - 3275</td>
<td>6442 - 2440</td>
<td>9234 - 4239</td>
</tr>
</tbody>
</table>

The study pages may be reproduced on large cards for use with groups.
<table>
<thead>
<tr>
<th>Test Page 1</th>
<th>Test Page 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>145 514 415 541</td>
<td>4781 7841 1874 1947 7481</td>
</tr>
<tr>
<td>293 392 239 932</td>
<td>6932 6923 3269 9632 2936</td>
</tr>
<tr>
<td>679 769 967 697</td>
<td>8054 4058 0845 8504 5408</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Page 3</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9542 2549 .459 9542 5924</td>
<td></td>
</tr>
<tr>
<td>8736 6378 6738 8376 7863</td>
<td></td>
</tr>
<tr>
<td>0123 1032 3120 3210 0213</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Page 4</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2186 6182 1286 1268 8621</td>
<td></td>
</tr>
<tr>
<td>7934 4937 7394 3479 4397</td>
<td></td>
</tr>
<tr>
<td>5273 3275 5723 3725 2573</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Page 5</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5678 5768 8675 6587 7856</td>
<td></td>
</tr>
<tr>
<td>9312 2319 9132 1293 2139</td>
<td></td>
</tr>
<tr>
<td>6442 2446 4642 2644 6442</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Test Page 6</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9514 5941 4519 9154 5914</td>
<td></td>
</tr>
<tr>
<td>8765 5768 8756 7856 5678</td>
<td></td>
</tr>
<tr>
<td>9234 3249 2349 4239 9324</td>
<td></td>
</tr>
</tbody>
</table>
The ability to recall number facts for addition, subtraction, multiplication, and division is an important memory activity. A fun way to practice is to play Mathematical Bingo!

Regular bingo cards may be used or copies may be made using this form.

Teacher reads problems for which the answer is 1-75. Students cover the answer if it appears on their card.

The winner is the first student to complete a row, vertically, horizontally or diagonally.

For variation: The winner must form a pattern such as a square or cross.

Duplicate the bingo card. Have the students insert number randomly:

<table>
<thead>
<tr>
<th>B</th>
<th>I</th>
<th>N</th>
<th>G</th>
<th>O</th>
</tr>
</thead>
</table>

The teacher may wish to restrict the numbers placed on the cards to the answers to problems under study by the group at the time, such as specific multiplication facts.
WORD MEMORIZATION

Study Page 1

Study the list of words on this page.*

dog
wagon
bird
toy
hat
cake
happy
me
surprise
saw

*Length of time will vary according to the length of the list and the needs of the students.

Test Page 1

Circle the words on this page that were on the study page.

cat       me       cake       you
bird     surprise   candy     wagon
hat       dog       happy     toy
balloon   horse      sad       saw

Construct other study and test pages using words appropriate for the students.
WORD MEMORIZATION

Study Page 2

Study the list of words on this page*

flamingo
crosswalk
suitcase
road runner
watermelon
rocket
breath
character
goblin
unusual

*Length of time will vary according to the length of the list and needs of the student.

Test Page 2

Circle the words on this page that were on the study page.

character
goblin
ghost
rocket
airplane
suitcase

Thursday
belt
crosswalk
hospital
Florida
flamingo

watermelon
garage
breath
angry
unusual
sandwich

Construct other study and test pages using words appropriate for the students.
CLASSIFICATION OF WORDS

Study Page

Study the lists below and remember the classifications of the words in each group. The words are grouped together because they are all members of the same classification.

- crayon, paper, pencil, pen
- Friday, Wednesday, Saturday, Tuesday
- tennis, golf, bowling, swimming
- glass, plate, saucer, cup
- sweater, pants, coat, dress
- ocean, river, lake, stream
- palm, poplar, oak, spruce
- twenty, fifty, sixty, ten
- banana, orange, apple, pear

Test Page

Select from this list the words that would be appropriate names for each of the groups of words you studied.

1. months
2. clothing
3. lakes
4. fruits
5. sports
6. dishes
7. trees
8. materials
9. writing instruments
10. flowers
11. water bodies
12. vegetables
13. numbers
14. tools
15. days
16. minerals

Many similar study and test pages may be made. Use words from spelling, science, or social studies according to the grade level.
MNEMONIC MEMORY DEVICES

Here is a memory system to help you remember lists. This simple rhyme is easy to memorize:

One is a bun.
Two is a shoe.
Three is a tree.
Four is a door.
Five is a hive.
Six is sticks.
Seven is heaven.
Eight is a gate.
Nine is a line.
Ten is a hen.

This list will help you memorize another list by taking the word in the new list and relating it to one of the objects in the original list. If your new list was:

1. elephant
2. refrigerator
3. dog
4. etc.

You might think one is a bun in the shape of an elephant; two is a shoe flying out of the refrigerator when you open it; three is a tree with a dog sleeping under it.

Picture these associations in your mind as you think them. Try it! It's fun!

There are many other mnemonic devices to be discovered and shared. Find one that works for you!
"RUMOR" STORY

Discuss

How information is communicated.
Errors can be made in information we hear.

Activity

Divide class into groups of five.
Select a leader for each group.
Leader reads "Rumor" story.
Leader retells story to another member of the group.
That person tells a third member, third tells fourth, etc.
The leader remains with the group and puts a check mark over each section of the story that is changed with each telling.
When all the members of the group have told the story, each person should hear the original story and compare it to the story he/she told.

THE STORY

One summer afternoon Sally Jameson was riding her new blue English bicycle along the Old River Road. The dust rose in clouds behind her as she rounded the curve just before reaching the deserted Brightwell mansion.

As she reached the great line of oaks which led to the main house, an eerie wailing began. Thinking at first the sound was the wind in the tree branches, Sally kept on riding, but the noise grew louder and louder.

Although very frightened, Sally decided to investigate. Slowly and cautiously she rode up the long avenue of trees. Suddenly, from the gaping witch-tooth windows, small puffs of black smoke curled into the air. The wailing became a shriek like an air-raid siren. Sally entered the front door.

On her left was a great suit of armor without a head. Hanging over the stair rail was a bright Indian rug crazily colored in orange and gold and green. Scraping sounds like a dog scratching on woodwork came from overhead as Sally mounted the circular staircase.

Stiff with fear, Sally went toward the door. Just as she started into the room, a white shape came lunging at her, and in terror she backed away and fell headlong down the long flight of stairs. Sobbing and crying, she raced from the house and ran down the road leaving her bicycle behind. No one would believe her story but from that day to this, Sally maintains that a white shape in armor and a blanket rides an English bicycle down the dusty roads by the river.
OCCUPATIONS

Study Page

Study this list of authors and titles. Each title suggests an occupation. You will be expected to identify the occupation that goes with each name.

Shulman—How Children Learn
Kittleson—Behind the Stage Lights
Conner—How to Grow Roses
Bennett—Ocean Life
Newton—Good Health Through Good Diet
Burrows—Above the Clouds
Johnson—How to Build a Wood Frame House
Bloom—Exercise for Fun and Fitness
Bigge—Pen in My Hand
Markle—My Years in the White House

Test Page

Write the occupation that matches each of the author's names.

Burrows
Kittleson
Bloom
Bennett
Bigge
Markle
Shulman
Johnson
Conner
Newton

Discuss the occupations. Of course, there may be more than one "right answer."

Construct additional study and test pages to meet the vocabulary level and needs of the students.
MEMORY TASK CARDS

Task cards created for use with the memory factor are presented on the following pages. The task cards have also been printed on heavier stock and the sets (Stock No. 41-S-9941) may be ordered through the Office of Materials Development, 293-8140.
PICK A CARD

Materials Needed
Deck of playing cards

Number of Players
Two

Activity
1. Give a certain number of cards, about five, to your partner.
2. Partner studies the cards for 20 seconds.
3. Shuffle the cards back into the deck.
4. Give the entire deck to your partner who tries to find the cards studied.
5. Increase the number of cards to remember as proficiency increases.

Additional Activity
An excellent follow-up for this game would be to introduce a book on magic tricks with cards.
IMPROVE YOUR MEMORY!

Study the letters and shapes below for 30 seconds, then see if you can draw them from memory on another piece of paper.

In all memory tasks try to find cues that you can use to help you remember things better. For example in the above exercise did you notice that:

1. Each of the letters in the circles was made with a circular motion?
2. Each letter in a square was made with straight lines and was a small letter?
3. Each letter in the tall rectangles was tall (or had a stem)?

Now study these letters for 30 seconds then see if you can write them from memory on another piece of paper. Remember to look for cues to help you remember the letters.

<table>
<thead>
<tr>
<th>p - q</th>
<th>b - d</th>
<th>c - e</th>
</tr>
</thead>
<tbody>
<tr>
<td>w - m</td>
<td>h - k</td>
<td>s - z</td>
</tr>
</tbody>
</table>
General Rules

Chaos is a unique game which calls upon its players to use their memory skills.

Equipment

The equipment consists of one checkers playing board and 24 playing pieces. The playing pieces, when placed face down, are identical, but when turned over reveal a color (squares of chipboard with colored dots on one side).

Preparation

Each player takes six (or fewer for an easier game) playing pieces of the same color and shows the other players. These pieces become his/her set. The set is placed face down on the first row of circles on his/her side of the board. The player who has a green set moves first with play rotating to the left thereafter.

Object

The object of Chaos is to be the first player to move the entire set across the board to the opposite side.

Moves

During a turn a player can move his/her piece in either one or two ways, but always forward, sideways, or diagonally. He/she can move it along the board one circle per turn, or jump another piece directly next to it (including the player's own) as long as there is an empty circle to land on after the jump. A player can continue to jump as long as there is a piece directly next to his/her piece and a circle to land on. Before a player can move any playing piece across the center of the board his/her entire set must be moved out of the original positions, either forward or diagonally.

Penalties

1. When a player reaches the opposite side of the playing board s/he must turn the piece over (face up) and reveal its color. If the color is indeed his/her own, the piece remains there and may not be moved for the remainder of the game. If, however, the color belongs to another player, the playing piece is then turned over, and the player to whom the piece belonged must move it from that position on his/her next turn. The game then continues with the next player's turn.

2. If a player suspects that another player is moving a piece other than his/her own, the player may challenge the other player as soon as he/she has moved the piece. The piece is then turned over revealing its color. If the color is incorrect and the challenged player has moved the wrong piece, he/she must return that piece to the circle it occupied before his/her move and may not make another move until the next turn. If the move was correct and the challenger was wrong, the challenger forfeits his/her next turn.

Winner

The first player to get the entire set on the last row of the opposite side of the board wins the game.
This trick is a fun way to baffle your friends and keep your mental addition skills sharp. Prepare a chart like the one above using any two-digit number and the following rules for the 10-digit numbers:

Add 12 to the two-digit number and reverse the sum. This gives the first two digits of the 10-digit number. Example:

```
17
+ 12
---
29 -- 92
```

The rest of the 10-digit number is made by adding the two previous digits. If the sum is a 2-digit number, only one digit (in the one's place) is written.

```
9 + 2 = 11 -- 921
2 + 1 = 3 -- 9213
```

Show your chart to a friend, ask him/her to choose any 2-digit number on the chart and you will amaze them by "remembering" the 10-digit number. (Of course, you don't need to remember the number, just the system for figuring it out!)

Have fun!
Draw a doodle. Picture it in your mind.

Turn your paper over and redraw your doodle from memory. Compare. Were you accurate?

Add four details to your doodle. Study it and then add the same details to the doodle on the other side of the paper.

Exchange your doodles with a friend and draw the new doodle from memory.

As you repeat this activity, your doodles can get more and more complex as your memory improves!
LONG-TERM MEMORY

Draw a floor plan of your first home or draw details of a favorite toy.
Make a sketch of your street and add all the details you can remember.

Discuss

How is long-term memory like a videotape machine?

Does memory record everything visually in pictures or does it work with a memory system that records a process?
MEMORY BOOKS

Materials Needed

Chipboard
Plastic tape
Felt pens
Magazine pictures

Directions

Fasten pieces of chipboard together with plastic tape to form a folding "book."

Print numbers, letters, and words on some of the books in varying levels of difficulty.

Make a picture book using magazine pictures. You can cover pages with an acetate sleeve so you can change the pictures.

Practice memory activities with the books with a partner or in small groups.
MEMORY CARDS

Materials Needed

Chipboard
Stickers (available at many stationery, variety, and card stores) or
Small pictures (2-4 copies of each)
Paste or rubber cement
Clear contact paper

Directions

Rule chipboard into card-size rectangles. (Graph paper affixed to the chipboard with spray adhesive greatly simplifies this task!)

Attach pictures or stickers to the chipboard.

Cover entire board with clear contact paper.

Cut cards apart with paper cutter.

The number of cards determines the difficulty of the game. Make up to 120 cards consisting of 30 sets of 4 identical cards.

Memory Card Game

Any number of players may play.

Object of game: To turn over as many identical cards as possible (2, 3, or 4 of a kind).

Cards are shuffled and placed face down on the table (or floor).

The first player turns over four cards.

If 2, 3, or all cards are identical, then the player picks them up and places them to one side. Those cards which are not identical are turned over in the same position. In this way the game continues, players memorizing the cards as they are turned over, in order that they may select identical cards the next turn.

One player records the score after each turn.
When all players agree that there are no identical cards left on the table, the game ends. The player with the highest score wins.

**Scoring**

- 2 of a kind - one point
- 3 of a kind - three points
- 4 of a kind - four points

**Variation**

Let the students make the pictures to be used for the cards. The pictures may be very simple or very complex depending upon the students.

A category may be assigned, such as flags or flowers.
SQUARED MEMORY

Materials
21 large playing cards with a picture or design
21 smaller memory cards with identical picture or design

Number of Players
Two

Object of Game
To memorize and match as many memory cards as possible with playing cards.
To be able to memorize and place the memory cards in the same sequential order as the playing cards.

How to Play
Start with four of the 21 playing cards. Place them face up on the 4-squared board. Study the group for one minute. Turn them over, face down.

Take the small memory cards, go through them one by one to try and find the four cards that you think match the four playing cards. Try to put them in the same order as you laid out the playing cards on the board. Turn the playing cards over to see how many were matched correctly.

Give yourself one point for every matched pair. Give yourself an extra point for each card you placed in the proper order.

After you have received 100 percent on both matching and sequence with the four cards, continue the same idea with nine cards, studying the cards for two minutes, working up to 16 cards, studying them for three minutes.

This game can be played on boards by showing the students how to place the cards in a 2" x 2" matrix (4 squares), 3" x 3" matrix (9 squares), or a 4" x 4" matrix (16 squares).
"TWELVE" MEMORY

**Materials**

Four picture cards on which are pasted 12 different pictures.

Twelve 2" x 4" description cards for each picture card. These cards may be just one word or a sentence. Forty-eight description cards are needed for four players.

**Number of Players**

2 to 4

**Object**

To memorize all the pictures on a picture card and be able to find as many matching description cards as possible.

**Rules**

Each player is given a picture card on which are pasted 12 different pictures. A time limit of two minutes is given to the players to study their cards carefully and try to keep in mind the pictures found on their own card.

At the end of two minutes, the players place the picture cards face down on the table in front of them. The player who held picture card No. 1 then takes the stack of 48 description cards, shuffles them, and deals six to each player. The remainder of the pack is placed in the middle of the table. The players then look through their description cards to see if any of their cards describe one or more of the pictures on their picture cards. These cards are then placed face down on the table in front of the player. Once a card is placed on the table it cannot be put back into the player's hand. In the event that a player finds all the description cards match his/her picture card, he/she must draw four more cards from the stack and repeat the check for descriptions of the pictures.

The game actually begins when the player who held picture card No. 2 draws a description card from the pack. If the card drawn describes a picture from his/her picture card, he/she puts it on the table in front of him/her and draws another card from the pack. This continues until the player finds one he/she thinks doesn't match. He/She then discards one of his/her cards from his/her hand by placing it face up by the pack of description cards. The next player on the left then takes a turn. He/She may draw from the pack or pick up the discarded card of player No. 1.
The game continues in this manner. If the discard pile builds up and the player in line for a turn wants the card on top of the pile, he/she must take the entire pack. No player may take the discard pack unless the card on top is one that he/she needs. The game ends when a player accumulates all 12 description cards that match all pictures on his/her picture card. He then calls "Twelve." This player then turns all description cards and the picture card over and checks to see if they match. If no mistake is made that player receives 60 points or 5 points for each match. If, however, he/she has made a mistake he/she then loses 5 points. All other players then check their cards in the same manner with each player receiving 5 points for each match or losing 5 points for a mistake. When one player has received 60 points in one game the picture cards should be exchanged by the players and another game resumed. At the end of the playing time the player with the most points is the winner.
"FLASH" MEMORY

Materials
32 picture cards
5 sets of direction cards (12 cards to a set)
9" x 12" manila paper (one sheet per player)
Pencil or crayon (one per player)

Players
One player is preferable, but four may play to make it into a game to see who has the best memory.

Object
To be able to remember the sequence of picture cards and draw those pictures called for on the direction card.

How to Make
The picture cards are merely pictures colored and cut from a coloring book and pasted on individual cards.
The direction cards contain such directions as "Draw all four cards," "Draw the first and last picture," "Draw the second and fourth picture," and so on. For the harder sets one direction could be, "Move the first picture to the last position, now draw the first picture."

By using only four picture cards per player and thinking of all possible combinations, you should end up with 12 direction cards to a set.

Rules for Set 1
Each player folds his/her paper into 12 squares, and numbers the squares from 1-12. S/he then shuffles the picture cards and lays the top four cards of the stack face up on the table in front of her/him. S/he doesn't need the rest of the stack. The player should also shuffle the one set of direction cards to be used. Beginning players should always start with set 1. The player places the direction cards in a pack face down on the table. The player then studies the four picture cards for one minute, keeping in mind the sequence and the pictures shown. After one minute s/he turns the cards face down.
The player then turns over the first direction card and in square No. 1 draws what the card tells. S/he proceeds in the same manner through all 12 direction cards. S/he must not look at the picture cards during this time to refresh her/his memory. When the player is through with the direction card s/he is using s/he should turn it face down and build the pile in the sequence the cards were drawn.

When all 12 cards have been used and the 12 squares filled the player will correct her/his paper by turning the entire stack of direction cards over (they should be piled up in the sequence s/he drew them on the paper). S/he also turns over the picture cards. S/he then checks the drawings against each direction and picture card. When the player gets all 12 pictures correct s/he can go on to sets 2, 3, 4, and 5 which are more difficult.
Rules for Sets 2, 3, 4, and 5

In sets 2, 3, 4, and 5 the player should check his/her work as each direction card is completed.

The picture cards (for convenience sake) should be covered with paper rather than turned face down.

Other than this difference the game is played in the same manner as with set 1.
MEMORY CARDS

Materials Needed

Magazines
Paper (lined)
Pencils
Tagboard
Paste or rubber cement

To Prepare

Find good activity pictures with lots of details. Paste the picture on one side of the tagboard. Write 10 detail questions on the lined paper. Paste on the back of the tagboard.

For Memory Practice

Exchange cards.

Study the scene. (Set a time limit depending upon difficulty of picture and questions.)

Turn the card over and answer the questions.
CONVERGENT PRODUCTION
CONVERGENT PRODUCTION

INTRODUCTION

Code - N   Color - Yellow

Convergent production is the one SOI operation that is commonly used in the classrooms. The shifting and sorting of information to find the "right answer" is convergent production. Research to find an answer and the use of math computation to solve a problem are convergent. Convergent production generally relies heavily on reading skills.

If a student experiences difficulty in a convergent activity it may be necessary for that student to receive remediation in that content or product area in another operation such as cognition or memory.

The activities in this guide are built around the factors which make up the Structure of Intellect and are designed to supplement the material developed by Dr. Meeker found in the SOI Abilities Workbook. The activities follow the SOI cell coding called a trigram.

The materials were not written for any particular grade level. If the activity is not appropriate for one grade level, the idea or technique may easily be adapted by changing vocabulary or operations to meet specific needs.

The activities presented suggest a new twist to looking at and solving problems. The activities challenge the students to approach problems from a different angle and to break from the mold in their thinking.

Many of the activities can also be adapted and changed to fit into other operations. For example, activities used in NSC can be adapted for use in ESC since evaluation is used in sorting of information and finding the "right answer" in convergent production.

The first section of the guide contains materials which will be helpful in working with SOI and developing materials to fit the SOI model. A blank grid can be used to plot the needs of students in a particular operation. The names of students who need remediation in the area of NSU would be recorded in that cell, used this way you would need a grid for each operation you work with.

Games and other commercially prepared activities are used effectively within the SOI framework. Not only are these activities stimulating and exciting to the students, but they also offer another dimension to the SOI program. A list of materials available for convergent production has been included to aid teachers in putting together their own SOI Lab.

Following the coded activities and games, task cards are presented. The task cards have not been cell-coded since they do not lend themselves to any one particular cell but to several.
GLOSSARY FOR SOI FACTOR DEFINITIONS FOR CONVERGENT PRODUCTION
(WISC-R Analysis)

NFU - Ability to comprehend and reproduce an observed bit of behavior
NFC - Ability to sort or classify
NFR - Ability to deduce figural relationships
NFS - Reproduces a system of figural design
NFI - Ability to solve simple equations in terms of familiar forms

NSR - Finds nonverbal response to fulfill a given relationship between numerals or letters
NSS - States the order of symbolic systems from start to goal correctly
NSI - Substitutes or derives symbols as expected

NMU - Ability to state correct names of concepts and ideas
NMC - Forms correct groups from a large number of words or objects
NMR - Ability to correlate semantic representation
NMS - Arranges objects or events into a meaningful sequence
NMT - Shifts function of objects or part of something to use in a new way
NMI - Ability to state the correct deduction from given facts
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<td>Picture Completion Map Completion</td>
<td>Algebra--Fill in Missing Number</td>
<td>Deductions--Implications What would you do if...?</td>
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Many of the commercially prepared educational materials can be used to supplement the activities and materials developed for SOI operations. The following list contains materials which have been coded for Convergent Production. This list was taken from a more extensive list compiled by the Austin State School in Austin, Texas, for a PAR project to classify educational materials for SOI. In some cases, it was found that the materials could be used for several different cells in the SOI model and were coded accordingly. Additional cells (codes) are indicated in parentheses.

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<td>Puppet Playmates</td>
<td>NFU</td>
</tr>
<tr>
<td></td>
<td>Number Sequence</td>
<td>NSU (CSU, CSS)</td>
</tr>
<tr>
<td></td>
<td>Learn to Write Manuscript Letters</td>
<td>NFU (MFU)</td>
</tr>
<tr>
<td></td>
<td>Beads</td>
<td>NFR (if copying)</td>
</tr>
<tr>
<td></td>
<td>Shape Board and Shapes</td>
<td>NFR (CFR)</td>
</tr>
<tr>
<td></td>
<td>Classification Game (Seasons)</td>
<td>NFC (CFR, CFC, MFR)</td>
</tr>
<tr>
<td></td>
<td>Fractional Pies</td>
<td>NFU, NSF</td>
</tr>
<tr>
<td></td>
<td>Number Cards</td>
<td>NFU (CFU, CSU)</td>
</tr>
<tr>
<td></td>
<td>Time Game</td>
<td>NSS (CSS)</td>
</tr>
<tr>
<td></td>
<td>Tennis Shoe</td>
<td>NSF, NFR</td>
</tr>
<tr>
<td></td>
<td>Count-a-Ladder</td>
<td>NFS (CSS)</td>
</tr>
<tr>
<td></td>
<td>Nuts and Bolts</td>
<td>NFR (EFR)</td>
</tr>
<tr>
<td></td>
<td>Tracing Cards</td>
<td>NFU</td>
</tr>
<tr>
<td></td>
<td>Groovy Letters</td>
<td>NSU, NFU (CFU)</td>
</tr>
<tr>
<td></td>
<td>Groovy Numerals</td>
<td>NSU (CFU)</td>
</tr>
<tr>
<td></td>
<td>Bead Patterns</td>
<td>NFS</td>
</tr>
<tr>
<td></td>
<td>Seging Cards</td>
<td>NFU</td>
</tr>
<tr>
<td></td>
<td>Dimensional Color Block Design</td>
<td>NFR (MFR)</td>
</tr>
<tr>
<td></td>
<td>Buzzer Board Pattern Cards</td>
<td>NFU (MFR)</td>
</tr>
<tr>
<td></td>
<td>Position in-Space Posters</td>
<td>NMR (CMR, EMR)</td>
</tr>
<tr>
<td></td>
<td>Sequential Picture Cards II</td>
<td>NMR, NMS (CMS, CMI)</td>
</tr>
<tr>
<td></td>
<td>Association Picture Cards</td>
<td>NMR (CFR, CMR)</td>
</tr>
<tr>
<td></td>
<td>Door Locks</td>
<td>NFR (CFR, CFI, EFI)</td>
</tr>
<tr>
<td></td>
<td>Wood Templates</td>
<td>NFU (CFU)</td>
</tr>
</tbody>
</table>
MATERIALS FOR THE SOI ABILITIES WORKBOOK

The items listed below are needed to complete activities found in the SOI Abilities Workbook developed by Dr. Mary Meeker for convergent production.

The list is included in this guide to assist teachers in working with Meeker's material which this guide supplements. The list can be used as a shopping list or for requesting materials from students' families.

As teachers acquire these materials, they should be labeled and placed in a central area for easy access for students, aides, or helpers. Teachers may wish to consider keeping the material for each operation separate.

1. Tagboard
2. Plastic cookie holders from store
3. Coffee cans
4. Tambourine/bells
5. 4 milk cartons
6. Plastic coins
7. Paper money (bills)
8. 2 dozen wooden dowels, 3/8" diameter, 2' long
9. 6 different spices in jars
10. Sponge
11. 1 dozen paper cups
12. 1 dozen popsicle sticks
13. 1 plastic baby bottle
14. 1 glass bottle
15. 1 package 3" x 5" cards (lined)
16. 5 different state highway maps (example: California, Nevada, Utah, Idaho, Arizona, New Mexico)
17. 1 sheet clear acetate
18. 6 pieces strong tagboard, 1' x 2'
19. 1 dozen protractors
20. Jar full of dried beans
21. 1 touch bag full of items (example: plastic spoon, shell, nail, rock, ring, rubberband)
22. 1 package tagboard, 12" square
23. 1 ball of string
24. 1 nut and bolt
25. Magazine pictures of people
26. 2 pair dice
27. Strawberry carton
28. 1 can of peanut shells or plastic ones
CONVERGENT PRODUCTION ACTIVITIES

Activities for the convergent production factor are presented on the following pages. The letters (code) in the upper right-hand corner correspond to the Convergent Production Activities Grid presented in the Introduction to the Convergent Production section.

Answers to activity puzzles and games are presented at the end of the section.
DRAWING FIGURES

Draw the figures as they are described in the statements below.

1. Use your pencil to draw any shape in two sizes.

2. Draw a wavy line.

3. Draw a triangle inside the square.

4. Draw two circles touching each other.

5. Draw a parallelogram.

6. Draw a hexagon with a ball in the center.

7. Draw a box and put an X in the center.

8. Draw a diamond and put a triangle over it.

9. Draw a cone and draw a circle on the top of the cone.

10. Draw a square and put a dot on each of the four sides.
Reproduce or draw the letters for the words (on the left) in the spaces opposite.

<table>
<thead>
<tr>
<th>color</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>grass</td>
<td></td>
</tr>
<tr>
<td>book</td>
<td></td>
</tr>
<tr>
<td>quiet</td>
<td></td>
</tr>
<tr>
<td>song</td>
<td></td>
</tr>
<tr>
<td>clock</td>
<td></td>
</tr>
</tbody>
</table>
### REPRODUCING GROUPS OF LETTERS (COMPLEX)

Reproduce or draw the groups of letters (on the left) in the spaces opposite.

<table>
<thead>
<tr>
<th>llllllll</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>llllllll</td>
<td></td>
</tr>
<tr>
<td>mmmmm</td>
<td></td>
</tr>
<tr>
<td>momomo</td>
<td></td>
</tr>
<tr>
<td>ououou</td>
<td></td>
</tr>
<tr>
<td>glglglgl</td>
<td></td>
</tr>
<tr>
<td>obstreperous</td>
<td></td>
</tr>
<tr>
<td>labyrinth</td>
<td></td>
</tr>
</tbody>
</table>
DRAWING GAMES AREAS

Draw a picture of the four-square game area. Use a ruler and make sure all lines are the same length. Measure in centimeters. What is the distance around the four-square area?

Do the same for the hopscotch area. Are the squares in hopscotch the same size as those in four-square? How long is the hopscotch area?

What does a baseball diamond look like? Draw a picture of it. Measure in centimeters the distance between bases.

Record: __________
What is the distance from home plate to the pitcher's mound?

Record: __________
LIKENESSES AND DIFFERENCES

List as many ways as you can in which these leaves are different.

1. ____________________________________________ 2. ____________________________________________
3. ____________________________________________ 4. ____________________________________________
5. ____________________________________________ 6. ____________________________________________

Name things that are sticky.

1. ____________________________________________ 2. ____________________________________________
3. ____________________________________________ 4. ____________________________________________
5. ____________________________________________ 6. ____________________________________________

List all things you can think of that are soft and blue.

1. ____________________________________________ 2. ____________________________________________
3. ____________________________________________ 4. ____________________________________________
5. ____________________________________________ 6. ____________________________________________
What items are yellow that you can eat?

1. ______________________  
2. ______________________  
3. ______________________  
4. ______________________  
5. ______________________  
6. ______________________

List items that have wheels.

1. ______________________  
2. ______________________  
3. ______________________  
4. ______________________  
5. ______________________  
6. ______________________

What are the different ways you could light your house?

1. ______________________  
2. ______________________  
3. ______________________  
4. ______________________  
5. ______________________  
6. ______________________
WORD FRAMES (SIMPLE)

Match the word with its shape. Place the number for the word in the space to the left of the figure or frame shaped like the word.

1. look
   - A.

2. sun
   - B.

3. rays
   - C.

4. bring
   - D.

5. this
   - E.

6. apple
   - F.

7. talk
   - G.

8. tree
   - H.

9. window
   - I.

10. jump
    - J.
Match the word with its shape. Place the number for the word in the space to the left of the figure or frame shaped like the word.

1. uniformity
2. shallow
3. vacillate
4. fragile
5. haphazard
6. pitiless
7. plausible
8. tapestry
9. intermission
10. knitting

A.

B.

C.

D.

E.

F.

G.

H.

Q.
WHAT'S NEXT?

Study the first three drawings in each square to decide what pattern or relationship the figures have; then finish the square by making a drawing of your own that completes the pattern.

1.

3.

5.

2.

4.

6.
RELATIONSHIPS

How is the first picture in the set related to the second? Once you discover the relationship, complete the second picture set.

1. √
   is to
   as
   is to

2. √
   is to
   as
   is to

3. √
   is to
   as
   is to

4. √
   is to
   as
   is to

5. √
   is to
   as
   is to

6. √
   is to
   as
   is to
Using two jump ropes, make a small square inside a large square. Hold the ropes tight. Mark each line with chalk. Measure the squares.

Record your measurements.

Compare measurements with others in your class. What else can you discover by looking at the area?

Record your observations.

Again using the jump rope and the same procedure, make a triangle in a circle; be sure the corners of the triangle touch the edge of the circle. Measure the sides of each triangle.

Record your measurements.

Are the sides of the triangle the same or different lengths?
COMPLETE A PATTERN

In the series of figures below a pattern has been started. Study the drawings. When you know the pattern, complete the series by filling in the blank areas.

1.

2.

3.

4.

5.

6.

7.
The following squares, when put together in the correct order, form a map of the United States. Cut out the squares and rearrange them to make the map.
SOLVING PROBLEMS

Look before leaping.

How many squares can you find in this figure? ______

Maybe you said nine. But who said the squares had to be the same size?
In addition to nine squares this size □, isn't there one this size?

□

and four more this size? □

Which answer is better? Nine squares or 14?

If the best answer to the problem of the squares was not the first one you thought of, don't be surprised. People who take time to think about a problem often find a better solution than the first one. Use the same ways of thinking to solve the problems on the next page.
There are ____ circles
There are ____ triangles
There are ____ rectangles
There are ____ squares

There are ____ circles
There are ____ triangles
There are ____ rectangles
There are ____ squares
The flexatube is made from a strip of four squares, each of which is ruled into four right triangles. Crease back and forth along all the lines, then tape the ends together to form the cubical tube. The challenge is to turn the tube inside out by folding only on the creased lines.

A durable version can be made by gluing 16 triangles of cardboard or thin metal onto cloth tape, allowing space between the triangles for flexing. It is useful to color only one side of the triangles, so that you can see at all times just what sort of progress you are making toward reversing the tube.
• PLOTTING POINTS

DO YOU REMEMBER HOW TO PLOT POINTS ON A GRID?

Plot these points and connect A to B, B to C, C to D, etc.

A (1, 3)    G (7, 4)
B (2, 3)    H (8, 0)
C (2, 4)    I (8, 5)
D (5, 4)    J (7, 5)
E (5, 6)    K (11, 1)
F (7, 6)    L (2, 1)
M (1, 3)

And here's another, if you aren't already "too tired".

A (1, 2)    K (7, 4)
B (3, 2)    L (5, 4)
C (3, 0)    M (3, 7)
D (4, 0)    N (3, 5)
E (4, 2)    O (2, 5)
F (7, 2)    P (2, 4)
G (7, 0)    Q (0, 4)
H (8, 0)    R (0, 3)
I (8, 5)    S (2, 3)
J (7, 5)    T (1, 2)

OK! So these pictures aren't works of art. Why don't you design a picture? Write down the ordered pairs and exchange with a friend.
MAP GAME

Materials Needed
Map grid (See next page.)
Set of playing cards (See below.)
Marker for each player

Rules
You will need to use your map reading skills to play this game.
Each player draws a card in turn and follows the directions on the card. The
object is for the player to get his/her marker to outer edge of grid first. The
player who does is the winner.

To Make Playing Cards
Type the directions below for playing cards. Use cardboard for backing.

Move 10° North and 20° West
Move 20° South and 10° East
Move 10° North and 10° East
Move 10° North and 10° West
Move 10° North and 10° West
Move 10° South and 10° West
Move 10° South and 10° East
Move 10° South and 10° East
Move 30° South and 20° East
Move 30° South and 20° West

Move 20° North and 20° West
Move 20° North and 20° East
Move 20° North and 20° East
Move 10° North and 10° West
Move 10° North and 10° East
Move 10° North and 10° East
Move 10° South and 10° East
Move 10° South and 10° West
Move 10° East
Move 10° West
How well can you copy? The "letter" below is made up of nonsense words. See how well you can copy it. Check your words to be sure that you have copied correctly. You might want to time yourself to see how long it takes you. Copy the letters on the lines below each word.

<table>
<thead>
<tr>
<th>Aeci</th>
<th>bcme</th>
<th>core</th>
<th>htvw</th>
</tr>
</thead>
<tbody>
<tr>
<td>htoi</td>
<td>ueki</td>
<td>mnca</td>
<td>te</td>
</tr>
<tr>
<td>ffooj</td>
<td>Mpgj</td>
<td>sru</td>
<td>jkui</td>
</tr>
<tr>
<td>fohha</td>
<td>rvlnpo</td>
<td>Gtse</td>
<td>dbpg</td>
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<tr>
<td>nrwy</td>
<td>uoiklm</td>
<td>Mnjkh</td>
<td>behj</td>
</tr>
<tr>
<td>nhb</td>
<td>ifjh</td>
<td>vicre</td>
<td></td>
</tr>
<tr>
<td>Sneth</td>
<td>ifugyea</td>
<td>das</td>
<td></td>
</tr>
<tr>
<td>uf.</td>
<td>Tervg</td>
<td>nhdys</td>
<td>pehsk</td>
</tr>
<tr>
<td>iheionh.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SYMBOLS FOR LETTERS

Each letter below is paired with a symbol. Sometimes the symbols for letters are very similar but still different. In the space below, put the correct symbols with the letters.
PLAN A PARTY.

Below is a list of items you need for your party. At the supermarket you buy the items on the list.

Write down the cost of each item.

What was the total cost for your party.

Graham Crackers
Chocolate
Marshmallows
Juice
Cups
Napkins
ADD UP THE NUMBERS!

The raindrops = _______

The umbrellas = _______

The ducks = _______

Total: _______ + _______ + _______ = _______

The raindrops and umbrellas = _______ + _______ = _______

The umbrellas and ducks = _______ + _______ = _______
How Much Does THIS Garden Grow?

Add up each flower!

A = _______  D = _______  B = _______
E = _______  C = _______  F = _______
A + 1 = _______  B + 1 = _______  C + 1 = _______
D + 1 = _______  E + 1 = _______
F + 1 = _______
HOW MUCH MONEY IS IN EACH PIGGY BANK?
### WHAT WOULD YOUR CHANGE BE?

<table>
<thead>
<tr>
<th>You buy:</th>
<th>You pay:</th>
<th>You get back:</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Kite" /> 6¢</td>
<td><img src="image" alt="10¢" /></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Ball" /> 8¢</td>
<td><img src="image" alt="10¢" /> <img src="image" alt="10¢" /></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Ice Cream" /> 5¢</td>
<td><img src="image" alt="10¢" /> <img src="image" alt="10¢" /></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Balloon" /> 3¢</td>
<td><img src="image" alt="5¢" /></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Baseball" /> 11¢</td>
<td><img src="image" alt="10¢" /> <img src="image" alt="5¢" /></td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Kite" /> 6¢</td>
<td><img src="image" alt="5¢" /> <img src="image" alt="5¢" /></td>
<td></td>
</tr>
</tbody>
</table>
HOW MUCH IS A WORD WORTH?

Use this code:

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>1c</td>
<td>2c</td>
<td>3c</td>
<td>4c</td>
<td>5c</td>
<td>1c</td>
<td>2c</td>
<td>3c</td>
<td>4c</td>
<td>5c</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>O</th>
<th>P</th>
<th>Q</th>
<th>R</th>
<th>S</th>
<th>T</th>
</tr>
</thead>
<tbody>
<tr>
<td>1c</td>
<td>2c</td>
<td>3c</td>
<td>4c</td>
<td>5c</td>
<td>1c</td>
<td>2c</td>
<td>3c</td>
<td>4c</td>
<td>5c</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>U</th>
<th>V</th>
<th>W</th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>lc</td>
<td>2c</td>
<td>3c</td>
<td>4c</td>
<td>5c</td>
<td>1c</td>
<td></td>
</tr>
</tbody>
</table>

Add up these words.

1. Love = 2c + 5c + 2c + 5c = 14c

2. Your name =

3. Your last name =

4. Your teacher's name =

5. Your mom's name =

6. Your dad's name =

7. Favorite food =

8. The days of the week =

How many 25¢ words can you think of?
## BE MONEY WISE

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>14</td>
<td>5+</td>
<td>5+</td>
<td>104</td>
<td>104</td>
<td>104</td>
<td>14</td>
</tr>
<tr>
<td>B</td>
<td>104</td>
<td></td>
<td></td>
<td>5+</td>
<td>5+</td>
<td>5+</td>
<td>14</td>
</tr>
<tr>
<td>C</td>
<td>254</td>
<td>104</td>
<td>104</td>
<td></td>
<td>5+</td>
<td>5+</td>
<td>14</td>
</tr>
<tr>
<td>D</td>
<td>104</td>
<td>104</td>
<td>5+</td>
<td>5+</td>
<td></td>
<td>5+</td>
<td>14</td>
</tr>
<tr>
<td>E</td>
<td>104</td>
<td>104</td>
<td>5+</td>
<td>5+</td>
<td>5+</td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>F</td>
<td>104</td>
<td>104</td>
<td>5+</td>
<td>5+</td>
<td>5+</td>
<td>5+</td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>14</td>
<td>14</td>
</tr>
</tbody>
</table>

- **A** = _____¢
- **B** = _____¢
- **C** = _____¢
- **D** = _____¢
- **F** = _____¢
- **G** = _____¢

- Set _____ has the most money
- Set _____ has the least money

**Set C** = Set _____

- **A** > _____
- **F** < _____

- **A + B** = _____¢
- **B + C** = _____¢
- **D + E** = _____¢
- **A + E** = _____¢
- **C + G** = _____¢
- **E + C** = _____¢
- **A - B** = _____¢
- **D - C** = _____¢
MEASUREMENT

Use a piece of roving about 1 meter long to measure and record:

Around your waist ________________________________

Around your friend's waist ________________________________

From floor to top of your head ________________________________

From floor to top of your friend's head ________________________________

The width of the span of your arms ________________________________

The length of your foot ________________________________

Your best friend's smile ________________________________
FIND THE COST OF ONE

1. If bananas sell for 60 cents a dozen, how much will 7 cost?
2. Robert reads the same number of pages in a book each day. In 3 days he read 54 pages. How many pages would he read in 7 days?
3. If 5 apples cost 25 cents, how much will 17 apples cost?
4. If 4 yards of silk cost $4.48, what will 3 yards cost?
5. If a dozen eggs cost 60 cents, how much will 9 eggs cost?
6. In 4 days Tom eats 18 slices of bread. How many slices does he eat in 5 days?
7. If 15 books cost $90, how much will 18 books cost?
8. If 3 city blocks are 1020 feet long, how far does a boy go when he skates 13 blocks?
9. If 8 pieces of cloth measure 56 feet, how long would 9 pieces be?
10. If 18 pieces of cloth contain 630 yards, how many yards would there be in 15 pieces?
11. If 3 crates of eggs contain 90 dozen eggs, how much will 5 crates contain?
12. If 5 yards of material cost $9.20, how much would 12 yards cost?
13. If 13 people in the class paid $16.25 for lunches, how much would 33 people pay?
14. If you cut 6 top strings out of 9 yards, how many yards would it take for 11 strings?
15. If Mary used 27 buttons on 3 dresses, how many buttons would she use on 2 dresses?
16. If 6 crates of strawberries contain 96 boxes, how many boxes will 6 crates hold?
17. If there are 36 beets in 4 bunches, how many beets would there be in 10 bunches?
18. If 6 bunches of asparagus cost $2.10, how much would 15 bunches cost?
19. If the clothes for 8 boys cost $54, how much would clothes for 7 boys cost?
20. If 8 sleds cost $88.64, how much would 5 sleds cost?
PRODUCTS

This game gives you a chance to practice your multiplication skills.

Level
Grades 3-6

Number of Players
Two to four

Materials Needed
Small pieces of colored paper
Playing board

Object
To cover the most products on the board with a player's color

How to Play
Each player chooses a color. The players take turns rolling one die. The
player must cover a multiple of the number s/he rolls with her/his color. When
all products are covered the game is over. The winner is the player who has the
most products covered. If a player cannot find a multiple of her/his number on
the board s/he may pass.

Variation
This game can also be called "Sums" and can be used as an addition game with
smaller numbers.

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>6</td>
<td>81</td>
<td>32</td>
<td>60</td>
<td>56</td>
</tr>
<tr>
<td>3</td>
<td>18</td>
<td>44</td>
<td>5</td>
<td>42</td>
<td>35</td>
</tr>
<tr>
<td>25</td>
<td>22</td>
<td>54</td>
<td>63</td>
<td>21</td>
<td>55</td>
</tr>
<tr>
<td>16</td>
<td>36</td>
<td>10</td>
<td>45</td>
<td>2</td>
<td>64</td>
</tr>
<tr>
<td>27</td>
<td>7</td>
<td>4</td>
<td>72</td>
<td>20</td>
<td>8</td>
</tr>
<tr>
<td>15</td>
<td>9</td>
<td>14</td>
<td>24</td>
<td>77</td>
<td>30</td>
</tr>
</tbody>
</table>
### Directions

<table>
<thead>
<tr>
<th>Example</th>
<th>You Do It</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Write any three figures so that they decrease by one from left to right.</strong></td>
<td>543</td>
</tr>
<tr>
<td>Reverse the number.</td>
<td>345</td>
</tr>
<tr>
<td>Subtract the smaller from the larger.</td>
<td>543 - 345 = 198</td>
</tr>
<tr>
<td>Your answer will always be 198.</td>
<td></td>
</tr>
</tbody>
</table>

| Write any number you wish | 8 |
| Add 5. | 5 + 8 = 13 |
| Multiply by 3. | 13 x 3 = 39 |
| Subtract 9. | 39 - 9 = 30 |
| Divide by 3. | 30 ÷ 3 = 10 |
| Subtract your original number. | 10 - 8 = 2 | |
| Your answer will always be 2. | | |

| Write any three figures. | 421 |
| Reverse the number. | 124 |
| Subtract the smaller from the larger. | 421 - 124 = 297 |
| Reverse the answer. | 792 |
| Add to original answer. | 792 + 297 = 1089 |
| Your answer will always be 1089. | 1089 |

| Write any number three times. | 666 |
| Add the three figures. (6 + 6 + 6) | 18 |
| Multiply by 37. | 37 x 18 = 666 |
| Your answer is the first number you wrote. | | |

| Write any number with four figures. | 4362 |
| Reverse the number. | 2634 |
| Subtract the smaller from the larger. | 4362 - 2634 = 1728 |
| Your answer can always be evenly divided by 9. | | |
MATH BRAIN TEASERS

1. In order to score 100 on the dart board above, how many darts must you use? Where will your darts land?

2. The winner scored 100 points with 6 darts. There was only one dart in each ring. The score on each ring is a multiple of 5. No number was repeated. What numbers go in the other rings if the number in the center ring is 50?

3. The winner scored 100 points with 6 darts. The number in one ring was twice the number in one of the other rings. The number in another ring was three times the number in one of the other rings. What numbers go in the other rings if the center ring is 40 and you have only one dart in each ring when you score 100 points?

MAGIC SQUARE

Place the numbers 1 - 9 in the squares so they add up to 15 in all directions.
CODES AND CIPHERS

Some secret messages are called codes while others are called ciphers. In a code a group of letters or a word may have a secret symbol such as:

S = Secret
SS = Secret Spy

A cipher is different; each letter in a cipher has a symbol such as:

SECRET  ce r st
573178 3 7 1 5 8

Some messages can be found hidden or may be scrambled into another message.

Try solving the following ciphers and codes. You may wish to make up some of your own for your friends to solve.

1. Here is the key for a cipher.

A B C D E F G H I J K L M N O P Q R S
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38

T U V W X Y Z
40 42 44 46 48 50 52

Use the key to decipher this message:

4 - 10 - 46 - 2 - 36 - 10 30 - 12 38 - 10 - 6 - 36 - 10 - 40
6 - 30 - 8 - 10 - 38

2. Here's another way to send a message.

c anyo uf indt. heme ssage

3. This one is fun, too.

W Y D A D E
H A Q E T D
I W Y R H O
C H O U E C

4. Or how about a scramble?

T A S W E O T N N A W T T N O
See if you can break these messages.

1. This cipher needs this phonetic alphabet to be broken:

   a = ay  g = jee  l = el  q = cue  v = vee
   b = be  h = atech  m = em  r = or  w = dubleu
   c = see  i = aye  n = en  s = es  x = ex
   d = dee  j = jay  o = oh  t = tea  y = why
   e = ee  k = key  p = pea  u = ewe  z = zee

   Eeayeswhy, ayees ayeta enohtea?

2. Look closely and you'll solve this one:

   I fyo ure allykno who wtose einn eww aysyo urprob lemiss olv ed.

3. Don't go off in the wrong direction for this one:

   Edam ti evah uoy, flearuoy esrever uoy fi.

4. This is a cryptogram, so code letters are substituted for the correct letters.

   It is part of a famous rhyme. Clue: \(v\) stand for \(a\)  \(a\) stands for \(l\)

   svpl  at  cnoaht.
   svpl  at  xfnpl
   svpl  kfoy  mbtu
   idt  pvcrht  qinpl

5. Try to decipher this:

   YYURY YUB I CUR Y Y 4 me.
WHAT DO THESE SYMBOLS MEAN?

Use the code on the next page to help you.

1. [Symbol Image]
2. [Symbol Image]
3. [Symbol Image]
4. [Symbol Image]
WHAT SENTENCE CAN YOU WRITE WITH THESE SYMBOLS?

Sentence.

______________________________

______________________________

______________________________

______________________________

______________________________
Coded Message:

Directions
Fill in the blanks in front of the letters to 'crack' the code. Then make up your own coded messages.

- A = (9 x 11) + 2
- B = 9 x 9
- C = 5 x 8
- D = 100 ÷ 10
- E = 48 ÷ 12
- F = 6 x 8
- G = 7 x 4
- H = 10^2
- I = 12 x 8
- J = 8 + 9
- K = 16 ÷ 2
- L = 21 ÷ 3
- M = 7 x 3
- N = 8 x 7
- O = 5 x 7
- P = 35 ÷ 7
- Q = (14 x 1) - 11
- R = 40 ÷ 2
- S = 8 x 9
- T = 6 x 6
- U = 4 x 0
- V = 63 - 62
- W = 5 x 3
- X = 27 ÷ 3
- Y = 36 ÷ 6
- Z = 2 x 11

Write message here:
Use the numbers on the flowers to complete these number sentences.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5 - 5 = 0</td>
<td>1 + 4 = 5</td>
<td>- + - = 8</td>
</tr>
<tr>
<td></td>
<td>- + - = 4</td>
<td>- + - = 7</td>
</tr>
<tr>
<td>- - - = 2</td>
<td>- - - = 3</td>
<td>- - - = 6</td>
</tr>
<tr>
<td>- + - = 8</td>
<td>- + - = 10</td>
<td>- - - = 3</td>
</tr>
<tr>
<td>- - - = 3</td>
<td>- + - = 12</td>
<td>- + - = 9</td>
</tr>
</tbody>
</table>
A party always has good food. Some Mores are fun to make and good to eat. To make one you need:

- 2 square graham crackers
- 4 squares of a chocolate bar (usually 1/2 of all bar)
- 1 melted marshmallow

If you plan to have ten people at your party and you plan for each person to have two Some Mores, how much will you need to buy? Answer the question below to find out.

- How many graham crackers will be needed? ____________________________
- How many marshmallows will you need? ______________________________
- What fraction of a chocolate bar is needed for one Some More? __________
- How many chocolate bars will you need altogether? ____________________
## ALPHABETICAL ORDER

Place the following words in alphabetical order. Each group should be alphabetized separately.

<table>
<thead>
<tr>
<th>A.</th>
<th>come</th>
<th>1.</th>
<th>code</th>
<th>2.</th>
<th>cone</th>
<th>3.</th>
<th>comb</th>
<th>4.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.</td>
<td>mean</td>
<td>1.</td>
<td>metal</td>
<td>2.</td>
<td>medal</td>
<td>3.</td>
<td>meal</td>
<td>4.</td>
</tr>
<tr>
<td>D.</td>
<td>beach</td>
<td>1.</td>
<td>bird</td>
<td>2.</td>
<td>brother</td>
<td>3.</td>
<td>bottle</td>
<td>4.</td>
</tr>
<tr>
<td>G.</td>
<td>street</td>
<td>1.</td>
<td>straight</td>
<td>2.</td>
<td>stream</td>
<td>3.</td>
<td>strap</td>
<td>4.</td>
</tr>
</tbody>
</table>
A WORD CHAIN

Starting with the key word make a new word by changing only one letter. The next person may now change any one letter to make a new word. See how many different words you can make.

Example

<table>
<thead>
<tr>
<th>LANE</th>
<th>LIFE</th>
<th>TAKE</th>
<th>RACE</th>
<th>FINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>LONE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOSE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOST</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COST</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAST</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CANT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CANE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SANE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAND</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAND</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

268
MISSING WORDS

Find all possible words within the squares of this puzzle. Move up, down, sideways, or diagonally. The same letter square may be used twice in the same word if another letter is used in between. In the example below, the letter "D" is used twice in the word "dead," but "E" and "A" are used between.
HIDDEN SENTENCES

Move from square to square, either up or down, or from side to side (not diagonally) to find the hidden sentence in each diagram.

Example

1. Start with S

```
  O  T  S
  O  E  U
  K  I  T
```

2. Start with I

```
  M  R  D  E
  A  O  F  K
  R  A  I  O
  T  H  L  O
```

3. Start with W

```
  W  O  E  T  W
  S  H  P  A  E
  E  H  O  P  C
  G  T  U  D  O
  N  I  R  N  R
```

281
270
Below are listed the initial and final letters of some four-letter words. List as many words as possible that begin and end with the given letters.

1. L - P
2. N - E
3. R - G
4. P - I
5. M - T
6. C - N
7. F - D
8. D - E
9. B - N
10. G - N
WORD WITHIN A WORD

Each of the words below has at least one word hidden in it. Circle the words you find within each word.

1. emotional
2. disarm
3. courageous
4. nobleman
5. concentrate
6. carbonated
7. castanet
8. eyelet
9. latchkey
10. phosphorescent
11. shipment
12. deformity
13. partisan
14. broadsword
15. centimeter
16. knowledge
17. cowardly
18. bright
19. condiment
20. killdeer
MAKE A WORD

What other words can you make from the following words by changing the arrangement of the letters?

Example
read  dear  dare

1. dater
2. dowery
3. dale
4. large
5. there
6. kids
7. nears
8. grab
9. tubs
10. name
11. plead
12. begin
13. made
14. realist
15. painters

273
Activities have not been provided for the cell NSI. This cell is best remediated through the teacher's own math program in the classroom. The SOI Abilities Workbook on Convergent Production (under the cell NSI) presents a diagnostic mathematics test which teachers may choose to use.
CONTRACTIONS

Contractions are two words that have been shortened to make one word. An apostrophe (') is used in place of the letter(s) that have been left out. For instance "I will" may be shortened to "I'll." In the following exercise change the words in parentheses to contractions.

Dear Pat,

(We have) 1. ______ been enjoying our vacation in the mountains. You (would not) 2. ______ believe the beautiful rivers and forests that (we have) 3. ______ seen here. (I would) 4. ______ like to stay here longer.

Last night (I had) 5. ______ gone to bed when I heard strange noises in our camp. (You will) 6. ______ not believe what I saw when I shined my flashlight out. A large brown bear was helping himself to our food. We (should have) 7. ______ put our food chest in the camper but we forgot. (It is) 8. ______ all torn up now. The bear ripped the lid off. (We will) 9. ______ have to buy a new food chest.

Tomorrow (I would) 10. ______ like to go on a long hike if it (is not) 11. ______ raining as it does here often.

I hope (you are) 12. ______ enjoying your vacation time. (It will) 13. ______ be good to see you when we return home.

Your friend,

Sean
MORE CONTRACTIONS

In the sentences below the contractions need to be changed to the two words that made up the contraction. See number 1.

Donna couldn't 1. could not lift all the books herself so she asked Valerie if she wouldn't 2. ____________ help out.

"It'll 3. ____________ be heavy, but I'm 4. ____________ working out regularly these days so I'd 5. ____________ be able to do it. You'd 6. ____________ never believe how good I've 7. ____________ been feeling since I exercise daily," answered Valerie.

"Well, that wasn't 8. ____________ so hard since we worked together," Donna said when they'd 9. ____________ finished.
BEGINNINGS AND ENDINGS

The first few letters in our mystery word are the same, but the words all have different endings. Use the clues to help you to find the missing letters.

A. Clues

1. Used to shine or polish
2. A long table holding a variety of food
3. Ox-like animal of Europe or Africa
4. A clown

1. buff
2. buff
3. buff
4. buff

B. Clues

1. Is the color of gold
2. Makes objects out of gold
3. A freshwater fish which has a reddish color
4. A metal with an outer layer of gold

1. gold
2. gold
3. gold
4. gold
C. Clues

1. Excessive, to a great degree
2. An introduction to a larger musical work
3. To project out over something
4. Working beyond the regular hours

1. over
2. over
3. over
4. over

D. Clues

1. To make shorter
2. Rapid handwriting in symbols
3. Not enough, deficit
4. Field position in baseball

1. short
2. short
3. short
4. short
E. Clues

1. Can be seen through
2. To change or reverse the order
3. Hinged window above a door or other window
4. The act of moving goods, materials, or people from one place to another

1. trans
2. trans
3. trans
4. trans

F. Clues

1. Not guilty
2. Located inside
3. One of nine divisions in a baseball game
4. To create or make something new

1. inn
2. inn
3. inn
4. inn
TIME

What will you most likely be doing at:

12:30 a.m.

12:30 p.m.

3:00 a.m.

3:00 p.m.

6:00 a.m.

6:00 p.m.

8:00 a.m.

8:00 p.m.
CLASSIFICATION OF ANIMALS

The animals listed below fit into special groups of animal classifications. Separate the animals in the list into their special groupings which are identified on the chart.

<table>
<thead>
<tr>
<th>angelfish</th>
<th>whale</th>
<th>shark</th>
</tr>
</thead>
<tbody>
<tr>
<td>newt</td>
<td>swan</td>
<td>mud puppy</td>
</tr>
<tr>
<td>salamander</td>
<td>penguin</td>
<td>horned lizard</td>
</tr>
<tr>
<td>cat</td>
<td>king snake</td>
<td>mouse</td>
</tr>
<tr>
<td>chicken</td>
<td>eel</td>
<td>toad</td>
</tr>
<tr>
<td>alligator</td>
<td>horse</td>
<td>boa constrictor</td>
</tr>
<tr>
<td>sea horse</td>
<td>raccoon</td>
<td>ostrich</td>
</tr>
<tr>
<td>frog</td>
<td>swordfish</td>
<td>tortoise</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fishes</th>
<th>Amphibians</th>
<th>Reptiles</th>
<th>Birds</th>
<th>Mammals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>
CLASSIFICATION OF PLACES

Place the following names into their correct classifications.

<table>
<thead>
<tr>
<th>Italy</th>
<th>Ireland</th>
<th>India</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicago</td>
<td>Antarctica</td>
<td>Paris</td>
</tr>
<tr>
<td>New York</td>
<td>Portugal</td>
<td>West Germany</td>
</tr>
<tr>
<td>United States</td>
<td>North America</td>
<td>England</td>
</tr>
<tr>
<td>Rome</td>
<td>Moscow</td>
<td>Tel Aviv</td>
</tr>
<tr>
<td>Europe</td>
<td>Iran</td>
<td>Finland</td>
</tr>
<tr>
<td>Asia</td>
<td>London</td>
<td>South America</td>
</tr>
<tr>
<td>Tokyo</td>
<td>Australia</td>
<td>Turkey</td>
</tr>
<tr>
<td>China</td>
<td>France</td>
<td>Athens</td>
</tr>
<tr>
<td>Africa</td>
<td>Israel</td>
<td>Oslo</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Continents</th>
<th>Countries</th>
<th>Cities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

203
CLASSIFICATION OF CAREERS

Into what categories do the following careers fall? Classify the careers according to the following criteria:

- Works outdoors most of the time
- Works indoors most of the time
- Works mostly with the hands
- Works with numbers

You may find that some careers may fall into more than one classification.

<table>
<thead>
<tr>
<th>Bricklayer</th>
<th>Flight attendant</th>
<th>Politician</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher</td>
<td>Veterinarian</td>
<td>Police officer</td>
</tr>
<tr>
<td>Metal worker</td>
<td>Telephone operator</td>
<td>Building contractor</td>
</tr>
<tr>
<td>Writer</td>
<td>Gardener</td>
<td>Research engineer</td>
</tr>
<tr>
<td>Forest ranger</td>
<td>Business manager</td>
<td>Attorney</td>
</tr>
<tr>
<td>Scientist</td>
<td>Baseball player</td>
<td>Fisherman</td>
</tr>
<tr>
<td>Architect</td>
<td>Clothing designer</td>
<td>Assembly line operator</td>
</tr>
<tr>
<td>Actor or actress</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Works Outdoors</th>
<th>Works Indoors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Works with Hands</th>
<th>Works with Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## ODD ONE OUT—ANIMALS

In each set of four words you will find one that doesn't belong. Cross it out.

### Sample:
- Horse
- Cow
- Dog
- Snake

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. angelfish</td>
<td>swordfish</td>
<td>sea horse</td>
<td>frog</td>
</tr>
<tr>
<td>2. alligator</td>
<td>tortoise</td>
<td>horned lizard</td>
<td>sea horse</td>
</tr>
<tr>
<td>3. parrot</td>
<td>penguin</td>
<td>ostrich</td>
<td>puffer</td>
</tr>
<tr>
<td>4. kangaroo</td>
<td>tortoise</td>
<td>platypus</td>
<td>seal</td>
</tr>
<tr>
<td>5. tadpole</td>
<td>puffer</td>
<td>shark</td>
<td>eel</td>
</tr>
<tr>
<td>6. mud puppy</td>
<td>newt</td>
<td>platypus</td>
<td>salamander</td>
</tr>
<tr>
<td>7. hummingbird</td>
<td>duck</td>
<td>chicken</td>
<td>mole</td>
</tr>
<tr>
<td>8. elephant</td>
<td>seal</td>
<td>whale</td>
<td>shark</td>
</tr>
<tr>
<td>9. sloth</td>
<td>toucan</td>
<td>tiger</td>
<td>walrus</td>
</tr>
<tr>
<td>10. iguana</td>
<td>tortoise</td>
<td>gila monster</td>
<td>salamander</td>
</tr>
<tr>
<td>11. emu</td>
<td>swan</td>
<td>rhea</td>
<td>otter</td>
</tr>
<tr>
<td>12. giraffe</td>
<td>tiger</td>
<td>lion</td>
<td>terrapin</td>
</tr>
</tbody>
</table>
The following sets of words contain three words that belong and one that does not. Find the word that doesn't belong and cross it out. In the blank write a word that will fit with the rest of the group.

<table>
<thead>
<tr>
<th>1.</th>
<th>San Diego</th>
<th>Paris</th>
<th>Chicago</th>
<th>England</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Moscow</td>
<td>Mexico City</td>
<td>Berlin</td>
<td>Uruguay</td>
</tr>
<tr>
<td>3.</td>
<td>Vienna</td>
<td>Cape Town</td>
<td>Memphis</td>
<td>Oregon</td>
</tr>
<tr>
<td>4.</td>
<td>Cairo</td>
<td>Ethiopia</td>
<td>Sydney</td>
<td>Tokyo</td>
</tr>
<tr>
<td>5.</td>
<td>Houston</td>
<td>Munich</td>
<td>Seattle</td>
<td>Chad</td>
</tr>
<tr>
<td>6.</td>
<td>Montreal</td>
<td>Quebec</td>
<td>Boston</td>
<td>Yukon</td>
</tr>
<tr>
<td>7.</td>
<td>San Francisco</td>
<td>Philadelphia</td>
<td>Miami</td>
<td>District of Columbia</td>
</tr>
<tr>
<td>8.</td>
<td>Detroit</td>
<td>Santa Fe</td>
<td>St. Louis</td>
<td>New Jersey</td>
</tr>
<tr>
<td>9.</td>
<td>Denver</td>
<td>Bolivia</td>
<td>Vancouver</td>
<td>Paris</td>
</tr>
<tr>
<td>10.</td>
<td>Rome</td>
<td>Bombay</td>
<td>Madrid</td>
<td>Iran</td>
</tr>
</tbody>
</table>

The word that doesn't belong in the first set is **England**. In the blank, write **Los Angeles**.
PAIRED RELATIONSHIPS

The first pair of words is matched to show a relationship. Match a word from the list that best completes the second pair and circle it.

Example
Cow is to calf as dog is to
a. kitten  b. poodle  c. puppy  d. animal

1. Needle is to sew as loom is to
a. yarn  b. spin  c. weave  d. rug

2. Window is to glass as cake is to
a. flour  b. oven  c. icing  d. pan

3. Eye is to sight as mouth is to
a. speak  b. taste  c. teeth  d. lip

4. Brick is to clay as steel is to
a. copper  b. furnace  c. iron  d. car

5. Bird is to fly as fish is to
a. water  b. scales  c. gills  d. swim

6. Black is to white as night is to
a. noon  b. sun  c. day  d. stars

7. The elephant is to a mouse as a hummingbird is to
a. duck  b. ostrich  c. whale  d. eagle

8. Green is to grass as blue is to
a. rainbow  b. flower  c. sky  d. eyes
9. Cold is to ice as fire is to
   a. burn  b. red  c. hot  d. smoke

10. Creek is to river as lake is to
    a. ocean  b. stream  c. water  d. river
HISTORY SEARCH

Which happened first? The following are important events in history but they are not listed in the order that they happened. You are to number the events in the order that they happened.

A. _________ Man landed on the moon.
B. _________ Civil War was fought.
C. _________ Columbus sailed to America.
D. _________ Gold was discovered in California.
E. _________ Pilgrims landed at Plymouth Rock.
F. _________ American Revolution ended.
G. _________ Declaration of Independence was signed.
H. _________ Marco Polo returns home with riches from China.
I. _________ The Vikings touch the shores of North America.
WHICH HAPPENED FIRST?

Read The Value Tale of Elizabeth Fry by Spencer Johnson, M.D., and then number the events listed below in proper order as they happened in the story.

A. ________ Schools were started in other prisons.
B. ________ Elizabeth visits the women's prison for the first time.
C. ________ Elizabeth lived in a lovely home in England.
D. ________ Elizabeth Fry worked with kings and queens of Europe to improve prison conditions.
E. ________ Elizabeth sees the women fighting in prison.
G. ________ Elizabeth taught the women in the prisons to read and write.
One method used to strengthen NMS is through sequencing. Sequencing through speaking is an effective technique in teaching students how to organize their thoughts and, at the same time, build confidence in a speaking situation. Book activities and sharing of news events are common speaking situations that can be used to help sequence ideas.

One effective technique is to begin with pantomime, giving small groups of students situations to act out. This activity can lead to dialog situations where the students actually have to plan what they will say as well as acting out the situation.

Student demonstration of a skill, craft, or hobby is another speaking situation that is effective in the classroom.

Two pages which are useful in helping students prepare for a speaking situation are included in this section. The outline can be used as an example for the student to follow. The outline can be modified to fit the age and needs of the students.
QUOTATION MIX-UP

Rewrite the following mixed-up quotations into sentences that make sense. Use capital letters where they belong.

1. Eye for an tooth a tooth a for an eye

2. Return I shall

3. Pie in finger every a

4. Day dog has his every

5. Are we amused not

6. Bread man doth alone by live not

7. Child spare and the rod spoil the

8. Satan behind me get thee
INTERNATIONAL SIGNAL CODE

The order of the sentences in the following paragraph has been mixed up. Rewrite the paragraph placing the sentences in the proper order.

The sailors look in the code book to understand the flag or flags. The International Signal Code is used by sailors from all different countries. Each flag stands for a message or part of a message. The sailors speak many different languages but they can all understand the flag messages. Each ship has a code book in the language of its country.
POINTS FOR EFFECTIVE SPEAKING

Enunciation
1. Speak words clearly.
2. Use full correct mouth, tongue, teeth, lip, and jaw movement.
3. Pronounce the whole word. Don't drop endings.
4. Don't substitute sounds.

Posture
1. Stand tall and straight.
2. Stay relaxed and comfortable.
3. Keep your hands at your sides when not in use.
4. Don't shift or sway.

Eye Contact
1. Look at individuals in all parts of your audience.
2. Speak to the friendly eyes in the audience.
3. Don't over-use your notes.

Voice Projection
1. Speak to the far corners of your audience.
2. Speak slowly and with force.

Vocal Variety
1. Have changes in pitch, high and low tones.
2. Work for changes in force, loud and soft.
3. Have variety in rate, slow and fast.

Two "Faces" of Criticism

When You Are the Critic
1. Be fair, honest, and tactful.
2. Have a friendly, helpful feeling.
3. Say something good along with something to work on.
4. Be objective, not personal and negative.
5. Give definite suggestions about how to improve, not vague general comments that are meaningless.
6. Judge others as you would be judged.

When You Are Being Criticised
1. Listen attentively to whatever criticism is offered.
2. Accept all comments graciously.
3. Ask about points you don't understand.
4. Keep a record of the main points, both strengths and weaknesses.
5. Correct at least one weakness the next time you speak.
6. Build your strengths: work on weak points.
SPEECH OUTLINE FORM

PURPOSE: ____________________________

TITLE: ______________________________

I. Introduction

II. Body
   A. 
   B. 
      1. 
      2. 
   C. 
   D. 
      1. 
      2. 
   E. 

III. Conclusion

305
Detective B. A. Hunter was the best detective on the whole Potsdam police force. Rare was the day he didn't bring in at least one dangerous criminal. Sometimes this courageous crime-fighter caught whole gangs single-handedly. But Hunter had one fault: He was forgetful. One day he forgot his handcuffs. Another day he forgot his gun. And so on. . . . It's lucky he could think up ideas quickly and substitute everyday items for things he forgot.

One day the chief called Detective Hunter. "There's been a crime at 91 Circle Drive," he said. "Report there at once to investigate!"

But when Detective Hunter arrived, he found that, as usual, he had forgotten something: his fingerprint powder.

Looking around, Detective Hunter saw a cigarette, a book of matches, and some .45 caliber bullets. "Thank heaven!" he exclaimed. "I see at least two things I can substitute for my missing fingerprint powder."

What could Detective Hunter use as a powder?

1. ____________________________________________________________________
2. ____________________________________________________________________

The answer is easy—if you "take things apart" or combine them.

Detective Hunter opened the bullets and used the gun powder inside. He could have lit the cigarette and used the ash as powder, too.

Anything can be used in more than one way.

How many uses for a piece of paper can you list? Don't forget the lesson of Detective Hunter.

1. ____________________________________________________________________
2. ____________________________________________________________________
3. ____________________________________________________________________
4. ____________________________________________________________________
5. ____________________________________________________________________
6. ____________________________________________________________________
7. ____________________________________________________________________
8. ____________________________________________________________________
9. ____________________________________________________________________
10. ____________________________________________________________________
11. ____________________________________________________________________
12. ____________________________________________________________________
13. ____________________________________________________________________
14. ____________________________________________________________________
15. ____________________________________________________________________
16. ____________________________________________________________________
17. ____________________________________________________________________
18. ____________________________________________________________________
19. ____________________________________________________________________
20. ____________________________________________________________________
USE IT ANOTHER WAY

What are the other ways you could use the following objects? It doesn't matter how unusual your idea is if it works.

<table>
<thead>
<tr>
<th>A Pencil</th>
<th>A Paper Clip</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>A Broken Crayon</th>
<th>An Old Tire</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>An Empty Egg Carton</th>
<th>A Butter Churn</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
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</tr>
</tbody>
</table>
COMBINE IDEAS.

If I have one dollar and you have one dollar and we trade, we each still have one dollar.

If I have one good idea and you have one good idea and we trade, we each have two good ideas.

Combining ideas creates more possibilities. On the checkerboard drawing below, the X means combining peach ice cream with butterscotch topping.

<table>
<thead>
<tr>
<th>TOPPINGS</th>
<th>ICE CREAMS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vanilla</td>
</tr>
<tr>
<td>Hot fudge</td>
<td></td>
</tr>
<tr>
<td>Cherry</td>
<td></td>
</tr>
<tr>
<td>Butterscotch</td>
<td></td>
</tr>
<tr>
<td>Chocolate</td>
<td></td>
</tr>
</tbody>
</table>

Pick a combination you like and list all the thing you could add to make it even better (nuts, whipped cream, etc.). Adding new things to your original idea is called elaboration. How many combinations can you come up with?
The game of Proverbs will give students a chance to match a situation with a proverb that it best illustrates.

**Directions**

Duplicate copies of the situations described on the following pages.

Duplicate copies of the proverb sheet on the following pages.

Divide the class evenly into five to fifteen groups depending on the size of the class.

Place one to three situations at each station along with the sheet of proverbs. Provide each student with an answer sheet numbered 1 to 15.

The students may work together at the tables to match the situations to the correct proverbs.

The students write the matching numbers on their answer sheet. (Example: Situation 1 matches Proverb 10.)

When time is called, each group moves to the next station, eventually rotating to all stations and matching all 15 situations with a proverb.

When all teams have completed the rotation the answers can be read and teams scored.

Ten points should be given for each correct answer.

The team with the highest score wins.
Situations

1. Johnny was on his way home from school. He remembered what the teacher said during a safety lesson that day. Look both ways before you cross the street. Watch the signal light to see if it is your turn to walk across the crosswalk. When he came to the intersection, the light signalled that it was time to cross. He looked both ways before stepping off the curb to cross.

2. Linda did not get out of bed when her mother called her to tell her it was time to get ready for school. By not getting up on time, she had to hurry and dress. She gulped down her breakfast and dashed off to school. Upon arriving at school she found she had forgotten her lunch, her math book, and her homework which was due that day. She tried calling home, but no one was there.

3. Jimmy was having fun at home putting his model airplane together. He had bought some glue just for this job. He was gluing the pieces together but he did not pay any attention to how much glue he was using. He wanted to make sure everything stuck together well. When he had just a few more pieces to put together he found he had run out of glue.

4. Students wrote their own play and planned to present it to another class. The scenery had taken a long time to make. Mary and Bob were to walk on stage. Mary was to pretend she was cooking on a stove, Bob to sit at the table talking to her. As they both entered on stage Mary slipped, knocking into Bob. Bob fell into the table, knocking it and most of the other furniture over. The table also tore some of the scenery. After the play, back in the classroom, Mary began to cry because Bob had gotten very angry over her clumsiness.

5. Mrs. Brown had read an ad in the paper about a sale on dresses. She arrived at the store before it opened. She waited until they opened the store doors and went in and purchased many good bargains.

6. Kim's mother looked on the calendar and realized Kim was due to have her yearly check-up with the dentist. She made an appointment for the next Wednesday after school. The dentist checked and x-rayed Kim's teeth and found everything was fine. She had no cavities.
7. A movie star made a great deal of money. It was a new thing for him to make so much money. Instead of putting it in a savings account he spent most of it on an expensive home, a yacht, expensive dinners, and such. Later, he was not as popular as before, and he found he was not asked to make any more pictures or appear on TV. Because he had spent all his money he could not afford to keep his lovely home or yacht. He had to find another kind of job.

8. David wanted to go to the football game the next Saturday. Tickets went on sale, but a limited number of tickets was being sold as the stadium would hold only so many people. David decided to wait until Wednesday after school to get his ticket as he would be going to Mark's house after school and he could stop in at the ticket agency on the way. The agency was out of his way when walking home on the other days. When Wednesday afternoon arrived he found the game was sold out.

9. Cynthia had had a bad day. It rained that morning. She slipped and fell in the mud on the way to school. At school she dropped her notebook and all the papers fell out. She had been hit by a ball at recess, and at lunch she found her mother had put a fresh egg in her lunch instead of a hard-boiled one. The one bright spot of the day, however, was when she arrived at math class—she found she had made the highest grade on the test she took the day before.

10. Jeff loved playing baseball. He longed to be the pitcher on the class team. He knew he could be a good one, but he never had the courage to ask the boys to give him a chance. Jeff never did get to be pitcher at any time during the season.

11. Christine decided to buy her lunch at school today. She was in line. The cafeteria was giving ice cream bars for dessert. While waiting in line some girls crowded in front of her which put her farther back in the line. Upon receiving their ice cream bars, the rude girls were disappointed with what the cafeteria gave them. When Christine's turn came, she found the cafeteria had run out of the kind she and the other girls didn't like and had started giving out the good kind she loved.

12. The Smith twins got together and decided to set up a lemonade stand. They made the lemonade, expecting to make a good deal of money and made plans to spend the money they earned on a tether ball game. They even went downtown and told the clerk they were coming back the next day to buy it. The lemonade stand did not make enough money that day or even all week to pay for the tether ball.
13. Sue and Jane were to be color guards for the scout troop at a PTA meeting. They both talked about all the things that could happen during the ceremony, such as dropping the flag, tripping and falling down, or even forgetting what they were supposed to do. They worried about it the night before meeting and all the next day. When the PTA meeting took place, the girl in the color guard were called in and everything went very nicely. None of the things happened the girls thought might take place.

14. The class was making a tile mosaic of a California mission. The students had the tiles on a rather wobbly table. Some of the boys leaned on the table and it collapsed. They landed on the tiles breaking some of them. Their teacher came over and said all was not lost as they could be fitted and glued together and would still fit into the mosaic.

15. Roger became very curious about all the wrapped packages on the shelves in his parents' closet. It was only a few days before his birthday and he knew they were all for him. He couldn't stand it any longer. He got a folding chair from the living room closet and put it up in his parents' closet. He climbed up on it, but as soon as he did it collapsed. He fell, bruising his knee and breaking his left wrist.
1. NOTHING VENTURED, NOTHING GAINED

2. EVERY CLOUD HAS A SILVER LINING

3. DON'T COUNT YOUR CHICKENS BEFORE THEY'RE HATCHED

4. CURIOSITY KILLED THE CAT

5. ALL'S WELL THAT ENDS WELL

6. A FOOL AND HIS MONEY ARE SOON PARTED

7. HE WHO HESITATES IS LOST

8. DON'T CROSS YOUR BRIDGES UNTIL YOU COME TO THEM

9. DON'T CRY OVER SPILLED MILK

10. LOOK BEFORE YOU LEAP

11. HASTE MAKES WASTE

12. THE EARLY BIRD CATCHES THE WORM

13. A STITCH IN TIMES SAVE NINE

14. EVERYTHING COMES TO HIM WHO WAITS

15. WASTE NOT, WANT NOT
MORE PROVERBS

Directions

Try to match the situation to the right proverb.

Proverbs

1. A rolling stone gathers no moss.
2. Look before you leap.
3. Haste makes waste.
4. The early bird catches the worm.
5. Nothing ventured, nothing gained.
6. Where there's a will, there's a way.
7. A stitch in time saves nine.
8. Curiosity killed the cat.
9. Don't count your chickens before they're hatched.
10. All that glitters is not gold.

Situations

1. Tim got to the ticket office early in the morning and got a good seat for the game. Bill went to the ticket office late that same afternoon but all the seats had been sold.

2. A new family moving from another city found a lovely new house atop a hill. They called it their "dream home." After they had been there for a short time they found many things wrong with it and decided it was too expensive to live there.

3. Although Joyce didn't feel like it she decided she had better put the trash out for pickup before it started to rain. It soon began to pour and the place where the barrels for trash were usually kept became a sea of mud.

4. John was always active outside school. He liked to learn new things and find new ways of doing things. Jim liked to rush home and watch his favorite TV shows.
5. Alan submitted a guess on the number of jelly beans in the jar at the candy store. He was so positive he would win that he went to the sports store and ordered a new baseball he had been wanting. He did not win the contest.

6. On the way to and from school Laura was always careful to look both ways before crossing the street.

7. The candy store put on a contest for the school children. The one who could come the closest to guessing the number of jelly beans in the jar would win $5.00. Mary tried, but Alice wouldn't as she said she never wins anything anyhow.

8. Tim was always asking questions. He wanted to find out about everything and everybody. Today he had to discover what it was his brother was doing in the garage. He stole in there while no one was around to have a look.

9. Betty did not get up when her alarm went off so she had to hurry to get ready for school. She ran all the way so that she wouldn't be late. When she arrived, she found she had forgotten all the homework she was supposed to turn in that day.

10. Steve had a tough math problem to do. He could have waited for the teacher to help him the next day. After trying many ways he finally found the solution on his own.
FOLLOWING DIRECTIONS

The following directions were given for cutting out and constructing a paper model. They do not make sense in the order they are now written. Number the directions in the order you think they should be followed.

A. On the six small triangles on the sides of the figure, bring the cut line over to the scored line.

B. Cut along solid lines.

C. Paste or glue.

D. Reproduce the pattern on construction paper.

E. Fold along dotted lines.
MEAN WHAT YOU SAY

Do we really mean what we say? What do you think the following expressions really mean.

1. It's raining cats and dogs.

2. Madder than a wet hen.

3. I'd give my eyetooth for that.

4. Don't count your chickens before they hatch.

5. Slower than molasses in January.

6. I could eat a horse.

7. Faster than greased lightning.

8. That's not my bag.
WHAT WOULD YOU DO?

What would you do if...

1. You broke a window at school?

2. Forgot your lunch?

3. You were lost?

4. The electricity went off?

5. You lost a library book?

6. You found money in the classroom?

7. Your friend copied your answers on a test?
What would you think if one morning you saw a zebra grazing in front of your house? Write a story about it.
Do you like to pretend sometimes? ________________________________

If you would like to pretend now, let's make-believe that you are green, green all over.

What are you? _____________________________________________

What do you look like? ______________________________________

__________________________________________________________

Can you move? _______ How? _________________________________

Can you make noises? ________________________________________

What do you sound like? _____________________________________

Will you always be green? _______ Why? _______________________

Can you help people or animals? ______________________________

How can you do this? ________________________________________

Draw a picture of what you are.
Let's pretend that you are furry—very soft and furry.

What are you? ____________________________________________________________

What do you look like? ____________________________________________________

__________________________________________________________

Do people like you? ________ Why? __________________________________________

__________________________________________________________

Can you move? ________ How? ______________________________________________

__________________________________________________________

What do you eat? _________________________________________________________

__________________________________________________________

How do you sleep? _________________________________________________________

__________________________________________________________

Draw your picture.
At times, after the children have written letters for practical purposes, they may enjoy using a letter in imaginative ways as a creative writing effort. Such letters can be used for reports in various subject-matter areas. Some suggestions are presented below:

**Letter from outer space.**
(You are the first person to land on the moon. Write us a letter telling about your trip and conditions on the moon.)

**Letter from another period in our history.**
(You've been transported in time to the days when the pioneers moved west, or to the world of tomorrow. Write a letter to your present-day family or classmates to tell of your experiences.)

**Letter from another country.**
(Write a letter telling about your experiences as a stranger or a visitor in another state or country.)

**Letter from a pet to master.**
(Write as though you were your pet, telling how s/he feels about the way s/he is treated, the things that annoy her/him, and so on.)

**Letter to the class that will be in your grade next year.**
(At the end of the year write to the boys and girls in the grade below yours to tell them about the achievements and special activities of your grade.)

**Letter to your favorite fictional character.**
(Write a letter to your favorite fictional character inviting him/her to spend some time with you and telling him/her why you two might enjoy doing some things together.)

**Letter to an American hero.**
(Write a letter to an American hero/heroine expressing your ideas on why the people of this country admire and respect him/her. You may want to tell some of the things you can do to show your appreciation for American heroes.)
WHO IS THE ENGINEER?

Can you discover who ran the train? This is an exercise in logical thinking and deduction. Sort out the facts and find your answer.

1. Smith, Jones, and Robinson are the engineer, brakeman, and fireman on a train, but not necessarily in that order. Riding the train are three passengers with the same three surnames, to be identified in the following premises by a "Mr." before their names.

2. Mr. Robinson lives in Los Angeles.

3. The brakeman lives in Omaha.

4. Mr. Jones long ago forgot all the algebra he learned in high school.

5. The passenger whose name is the same as the brakeman's lives in Chicago.

6. The brakeman and one of the passengers, a distinguished mathematical physicist, attend the same church.

7. Smith beat the fireman at billiards.

WHO IS THE ENGINEER?
WHO OWNS THE ZEBRA?

On a dirty street, stranger accosts stranger with a mimeographed sheet of paper and the question "Have you seen this?" In university dormitories, the problem is tacked to doors. In suburban households, the ring of the telephone is likely to herald a voice that asks, "Is it the Norwegian?"

The cause of the excitement is the brain-teaser below. The facts essential to solving the problem—which can indeed be solved by combining deduction, analysis, and sheer persistence—are as follows:

1. There are five houses, each of a different color and inhabited by men of different nationalities, with different pets, drinks, and cigarettes.
2. The Englishman lives in the red house.
3. The Spaniard owns the dog.
4. The Ukrainian drinks tea.
5. Coffee is drunk in the green house.
6. The green house is immediately to the right (your right) of the ivory house.
7. The Old Gold smoker owns snails.
8. Kools are smoked in the yellow house.
9. Milk is drunk in the middle house.
10. The Norwegian lives in the first house on the left.
11. The man who smokes Chesterfields lives in the house next to the man with the fox.
12. Kools are smoked in the house next to the house where the horse is kept.
13. The Lucky Strike smoker drinks orange juice.
15. The Norwegian lives next to the blue house.

Now, who drinks water? And who owns the zebra?

BRAIN TWISTER

This one is being used by some personnel directors in oral aptitude tests for job applicants; you're supposed to answer in one and one-half minutes:

If a man and one-half can eat a pie and one-half in a minute and one-half, how many men would it take to eat 60 pies in 30 minutes?
IT AIN'T NECESSARILY SO

The flagman who waves a lantern on a dark night at the railroad crossing is not doing his duty unless that lantern is lit. The same holds true of throwing a match into a kerosene-soaked pile of paper; nothing will happen unless you light the match first. Here is a quiz to test your thinking. Don't jump to conclusions, but think of all possibilities. Of the statements below, some are always true and some are not. Can you distinguish which are true and which are not? Score 10 for each correct answer. A perfect score is 90; average is 60. Take it easy before checking with the answer page.

1. Anyone who claims to foretell future events with positive certainty is a fake.  YES  NO

2. If you put your bare finger into a cup filled with coffee, your finger will get wet.  YES  NO

3. If your fingerprints are the same as those found on a glass, then you have touched that glass.  YES  NO

4. If I can see your eyes in the mirror, you can also see mine unless you're blind.  YES  NO

5. If you jump off the roof of the Empire State Building in New York City and you fall all the way, you'll be killed.  YES  NO

6. If you mix a good clear blue paint with a good clear yellow paint, the result will be green.  YES  NO

7. If an educated United States citizen, living in the United States for more than 21 years, is not allowed to vote, he/she has been guilty of some crime.  YES  NO

8. It is a very unseasonable January day if the temperature outside is 90° in the shade.  YES  NO

9. Anyone born on February 29th can celebrate his true birthday every four years.  YES  NO
THE DIRTY DOZEN

1. A woman gave money to a beggar. She was the beggar's sister, but the beggar wasn't her brother. Why?

2. Two sisters born on the same day to the same parents and who looked alike said they were not twins. Why?

3. How many animals of each kind did Moses take on the ark with him?

4. If a plane carrying United States citizens crashed in Mexico, where would the survivors be buried?

5. Seventeen students took a test. All but nine failed. How many passed?

6. An archeologist found two gold coins dated 39 B.C. He knew at once they were fakes. How?

7. If you went to sleep at 8:00 p.m. and set your alarm for 9:00 the next morning, how many hours sleep would you get?

8. If you had only one match and entered a dark room to start up a kerosene lamp, an oil heater, and a wood stove, what would you light first?

9. If a roof runs north to south, and a rooster on the peak faces east, which way will the egg roll?

10. How many outs in an inning of baseball?

11. A man builds a house with 4 sides to it, and it is rectangular. Each side has a southern exposure. A big bear wanders by. What color is the bear?

12. Two men played checkers. They played three games and each man won two. How?
ANSWERS

NFC-2 WORD FRAMES (SIMPLE)

A. 8 F. 6
B. 5 G. 3
C. 1 H. 2
D. 7 I. 4
E. 9 J. 10

NFC-3 WORD FRAMES (COMPLEX)

A. 2 F. 8
B. 5 G. 2
C. 1 H. 6
D. 4 I. 9
E. 10 J. 7

NFR-1 WHAT'S NEXT?

1.  
2.  
3.  
4.  
5.  
6.  
32
NFR-2  RELATIONSHIPS

1. [Geometric figure]
2. [Geometric figure]
3. any geometric figure
4. [Geometric figure]
5. any letter which is symmetrical
6. [Geometric figure]

NFS-1  COMPLETE A PATTERN

1. [Pattern]
2. [Pattern]
3. [Pattern]
4. [Pattern]
5. [Pattern]
6. [Pattern]
7. [Pattern]

NSC-1  FIND THE COST OF ONE

1. 35¢
2. 126 pages
3. 85¢
4. $3.36
5. 45¢
6. 22-1/2
7. $108.00
8. 4420 feet
9. 63 feet
10. 525 yards
11. 150 dozen
12. $22.08
13. $41.25
14. 16.5
15. 18 buttons
16. 144 boxes
17. 90 beets
18. $5.25
19. $47.25
20. $55.40
NSR-1  CODES AND CIPHERS

1. Beware of secret codes.
2. Can you find the message?
3. Which way do you read the code?

NSR-2  CODES, CRYPTOGRAMS, AND CIPHERS

1. Easy, is it not?
2. If you really know how to see in new ways, your problem is solved.
3. If you reverse yourself, you have it made.
4. Jack be nimble,
   Jack be quick,
   Jack jump over
   The candle stick.
5. Too wise you are,
   Too wise you be.
   I see you are
   Too wise for me.

NSR-3  WHAT DO THESE SYMBOLS MEAN?

1. Mother gave each of us a piece of cake.
2. Father has a new blue hat.
3. The boy and girl looked for their lost bird.
4. The ice cream man comes to our street at night.
Message: YOU ARE REALLY SPECIAL IF YOU FIGURE THIS OUT.

NSS-2 ALPHABETICAL ORDER

A.  B.  C.
1. code 1. meal 1. abide
2. comb 2. mean 2. alter
3. come 3. medal 3. always
4. cone 4. metal 4. anger

D.  E.  F.
1. beach 1. naughty 1. leap
2. bird 2. nice 2. leather
3. bottle 3. noise 3. leaves
4. brother 4. novel 4. leaving

G.  H.
1. straight 1. weigh
2. strap 2. weight
3. stream 3. weighted
4. street 4. weightless
1. Sue took it.
2. I looked for Martha.
3. We ate popcorn during the show.

**NSS-5 HIDDEN SENTENCES**

**NST-1 WORD WITHIN A WORD**

1. emotional
2. disarm
3. courageous
4. nobleman
5. concentrates
6. carbonated
7. castader
8. eyelet
9. latchkey
10. phosphorescent
11. shipment
12. demography
13. partisan
14. broadsword
15. centimeter
16. knowledge
17. cowardly
18. bright
19. condiment
20. kildeer

**NST-2 MAKE A WORD**

1. dater  trade, tread, rated
2. dowry  wordy, rowdy
3. dale  deal, lade, lead
4. large  glare, lager
5. there  three, ether
6. kids  disk, skid
7. nears  earns, snare
8. grab  brag, garb
9. tubes  bust, stub
10. name  amen, mane, mean
11. plead  pedal, paled
12. begin  being, binge
13. made  mead, dame
14. realist  retails, saltier
15. painters  pantries, repaights
NMU-1  CONTRACTIONS

1. We've  8. It's
2. wouldn't  9. We'll
3. we've  10. I'd
4. I'd  11. isn't
5. I'd  12. you're
6. You'll  13. It'll
7. should've

NMU-2  MORE CONTRACTIONS

1. could not  6. you would
2. would not  7. I have
3. It will  8. was not
4. I am  9. they would
5. I would

NMU-3  BEGINNINGS AND ENDINGS

A. 1. buffer  B. 1. golden  C. 1. overmuch
2. buffet  2. goldsmith  2. overture
3. buffalo  3. goldfish  3. overhang
4. buffoon  4. gold-filled  4. overtime

D. 1. shorten  E. 1. transparent  F. 1. innocent
2. shorthand  2. transpose  2. inner
3. shortage  3. transom  3. inning
4. shortstop  4. transportation  4. innovate
### NMC-1  CLASSIFICATION OF ANIMALS

<table>
<thead>
<tr>
<th>Fishes</th>
<th>Amphibians</th>
<th>Reptiles</th>
<th>Birds</th>
<th>Mammals</th>
</tr>
</thead>
<tbody>
<tr>
<td>angelfish</td>
<td>newt</td>
<td>king snake</td>
<td>chicken</td>
<td>cat</td>
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<tr>
<td>seahorse</td>
<td>salamander</td>
<td>alligator</td>
<td>swan</td>
<td>whale</td>
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<tr>
<td>eel</td>
<td>frog</td>
<td>horned lizard</td>
<td>penguin</td>
<td>raccoon</td>
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<tr>
<td>swordfish</td>
<td>mud puppy</td>
<td>boa constrictor</td>
<td>ostrich</td>
<td>mouse</td>
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<tr>
<td>shark</td>
<td>toad</td>
<td>tortoise</td>
<td></td>
<td>horse</td>
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</table>

### NMC-2  CLASSIFICATION OF PLACES

<table>
<thead>
<tr>
<th>Continents</th>
<th>Countries</th>
<th>Cities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>Italy</td>
<td>Chicago</td>
</tr>
<tr>
<td>Asia</td>
<td>United States</td>
<td>New York</td>
</tr>
<tr>
<td>Africa</td>
<td>China</td>
<td>Tokyo</td>
</tr>
<tr>
<td>Antarctica</td>
<td>Ireland</td>
<td>London</td>
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<td>North America</td>
<td>Portugal</td>
<td>Moscow</td>
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<tr>
<td>South America</td>
<td>Iran</td>
<td>Paris</td>
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<td></td>
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<td>Finland</td>
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<tr>
<td></td>
<td>Turkey</td>
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### NMC-3  CLASSIFICATION OF CAREERS

<table>
<thead>
<tr>
<th>Works Outdoors</th>
<th>Works Indoors</th>
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</thead>
<tbody>
<tr>
<td>Bricklayer</td>
<td>Teacher</td>
</tr>
<tr>
<td>Metal worker</td>
<td>Writer</td>
</tr>
<tr>
<td>Forest ranger</td>
<td>Scientist</td>
</tr>
<tr>
<td>Actor or actress</td>
<td>Architect</td>
</tr>
<tr>
<td>Gardener</td>
<td>Actor or actress</td>
</tr>
<tr>
<td>Baseball player</td>
<td>Flight attendant</td>
</tr>
<tr>
<td>Police officer</td>
<td>Veterinarian</td>
</tr>
<tr>
<td>Building contractor</td>
<td>Clothing designer</td>
</tr>
<tr>
<td>Fisherman</td>
<td>Politician</td>
</tr>
<tr>
<td></td>
<td>Research engineer</td>
</tr>
<tr>
<td></td>
<td>Attorney</td>
</tr>
<tr>
<td></td>
<td>Assembly line operator</td>
</tr>
<tr>
<td></td>
<td>Telephone operator</td>
</tr>
<tr>
<td></td>
<td>Business manager</td>
</tr>
</tbody>
</table>
NMC-3  CLASSIFICATION OF CAREERS (Cont.)

Uses Hands

Bricklayer
Metal worker
Gardener
Baseball player
Fisherman
Assembly line operator

Works with Numbers

Teacher
Scientist
Architect
Telephone operator
Business manager
Building contractor
Research engineer

NMR-1  ODD ONE OUT--ANIMALS

1. frog
2. sea horse
3. puffer
4. tortoise
5. tadpole
6. eel
7. mole
8. shark
9. toucan
10. salamander
11. otter
12. terrapin

NMR-2  ODD ONE OUT--CITIES

1. England
2. Uruguay
3. Oregon
4. Ethiopia
5. Chad
6. Yukon
7. District of Columbia
8. New Jersey
9. Bolivia
10. Iran

NMR-3  PAIRED RELATIONSHIPS

1. c. weave
2. a. flour
3. b. taste
4. c. iron
5. d. swim
6. c. day
7. b. ostrich
8. c. sky
9. c. hot
10. a. ocean
NMR-4  HISTORY SEARCH

A. 9  D. 8  G. 5
B. 7  E. 4  H. 2
C. 3  F. 6  I. 1

NMR-5  WHICH HAPPENED FIRST?

A. 3  E. 3
B. 2  F. 6
C. 1  G. 4
D. 7

NMS-1  QUOTATION MIX-UP

1. An eye for an eye, a tooth for a tooth.
2. I shall return.
3. A finger in every pie.
4. Every dog has his day.
5. We are not amused.
7. Spare the rod and spoil the child.
8. Get thee behind me, Satan.

NMS-2  INTERNATIONAL SIGNAL CODE

The International Signal Code is used by sailors from all different countries. The sailors speak many different languages but they can all understand the flag messages. Each flag stands for a message or part of a message. Each ship has a code book in the language of its country. The sailors look in the code book to understand the flag or flags.
### NMT-4 PROVERBS

<table>
<thead>
<tr>
<th>Situation</th>
<th>Proverb</th>
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<tbody>
<tr>
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### NMT-5 MORE PROVERBS

<table>
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<tr>
<th>Proverb</th>
<th>Situation</th>
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<td>1</td>
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<tr>
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<td>6</td>
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<td>9</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
</tr>
</tbody>
</table>
FOLLOWING DIRECTIONS

A. 4  B. 2  C. 5  D. 1  E. 3

WHO IS THE ENGINEER?

Smith

To Tally Facts

<table>
<thead>
<tr>
<th>Engineer</th>
<th>Brakeman</th>
<th>Fireman</th>
<th>L.A.</th>
<th>Omaha</th>
<th>Chicago</th>
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</thead>
<tbody>
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<td>1</td>
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<td>0</td>
<td>0</td>
<td>1</td>
<td></td>
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</tr>
</tbody>
</table>

WHO OWNS THE ZEBRA?

The Norwegian drinks water.  The Japanese owns the zebra.

HOUSES    Yellow  Blue  Red  Ivory  Green
INHABITANTS Norwegian Ukrainian Englishman Spaniard Japanese
PETS      Fox     Horse Snails Dog  Zebra
BEVERAGES Water  Tea  Milk  Orange Juice Coffee
CIGARETTES Kool     Chesterfield Old Gold  Lucky Strike Parliament

BRAIN TWISTER

If one and one-half men can eat one and one-half pies in one and one-half minutes, twice as many men can eat twice as many pies in the same time. If three men can eat three pies in one and one-half minutes, then one man can eat one pie in one and one-half, minutes. So in 30 minutes one man can eat 30 divided by one and one-half, or 20 pies; and three men would be needed to eat 60 pies in 30 minutes.
IT AIN'T NECESSARILY SO

1. NO (Eclipse of sun and moon, and weatherman)
2. NO (Instant coffee)
3. YES
4. YES
5. NO (Only 6 floors. The observation platform is 6 levels below cop.)
6. YES
7. YES
8. NO (Not in Australia or South America.)
9. NO (1900 is not a leap year.)

THE DIRTY DOZEN

1. The beggar was her sister.
2. They were part of triplets.
3. Moses did not build the Ark.
4. Survivors would not be buried.
5. Nine
6. People would not know when Christ would be born.
7. One hour
8. The match
9. Rooster would not lay an egg.
10. Six
11. White—house on North Pole so bear is a polar bear
12. They were not playing each other.
CONVERGENT PRODUCTION GAMES

These game activities can be made to use in the convergent production lab or as a group activity for students when working in the area of convergent production.

Games may also be used to supplement reading or math activities thus giving students further convergent experiences in these areas.

Twickenham

Eleven discs are arranged in a circle as shown. The bottom disc is vacant. Object is to spell Twickenham in a clockwise direction leaving the bottom space vacant again. Darker markers move only clockwise and light markers move counterclockwise. A disc may jump one of the opposite color if there is the vacant space available to land upon. Can you do this in 26 moves?

Fisherman

This is a spelling game for two. One player is chosen to be the fisherman. S/he mentally selects a word and draws one dash for each letter in that word. The other player tries to guess the word by calling letters of the alphabet. As a letter is called, it is crossed out, and may not be guessed again. If the letter called is in the word, the fisherman writes it on the proper dashes as many times as it occurs. If it is not in the word, one line is drawn on the fisherman as shown. The object of the game is to guess the word before the fisherman can catch the fish.
Snap

Number of Players: 2 or more

Rules: Two or more players may play. Deal all cards evenly among the players. Each player puts his/her cards face down in a stack in front of him/her. Each player in turn takes the top card and turns it face up. If it is a synonym of a face-up card in any opponent's stack, either player may say "Snap!" The player saying "Snap" first gets all the cards in his/her opponent's face-up stack. He/She puts them at the bottom of his/her face-down stack, and the game continues. The object is to take all the cards from the opponents. If the playing time ends before any player takes all the cards, the player holding the most cards (counting both the face-up and face-down stacks) is the winner.

Synonym Rummy (Another type game to be used with the same cards.)

Number of Players: 2 or 4

Rules: Deal 6 cards to each player. Place the remaining cards face down in the center of the table, and turn the top card face-up beside the stack.

The object is to collect sets of 3-4 synonyms.

Player 1 opens by drawing either the face-up card or the top card from the stack. S/He arranges the cards in his/her hand by synonym sets and discards one unwanted card, placing it on the face-up pile.

Player 2 may then draw either Player 1's discard or the top card of the face-down stack, and so on.

Each time a player collects a set of 3 or 4 synonyms s/he may place them face up on the table in front of her/him. If a player lays down a set of 3 cards and any other player holds the fourth card to that set, that other player may lay the card face-up in front of her/him and it will count in her/his score.

The game ends when one player has laid down all the cards in her/his hand. Each player then counts the cards on the table in front of her/him, and the person with the most cards wins.

How to Make: Prepare 52 cards (13 sets of synonym cards).

Proverb Game

Number of Players: 2 to 4

Materials: 1 pack of 30 proverb cards
1 list of proverbs in the set
15 small sticker cards with matching picture to proverb cards
1 story board
4 story cards whose stories match those on the story board--1 for each player
1 answer card to the story board
Proverb Game (Cont.)

Object: To see which player can match the most proverbs and proceed to match the proverbs to the proper description.

Rules: Dealer deals 4 cards to each player. (Five cards are dealt if less than 4 are playing.) The remaining cards are stacked in a pack in the center of the table. Player on dealer's right starts the game by asking someone for a matching proverb card. (The players must ask for the missing line of the proverb not the picture on the card.) If the player asked has the card, it must be given. The player then gets another turn. When another player does not have the card the player is asking for, the player who asked must draw from the pack. Whenever a player makes a match s/he takes the cards from her/his hand and lays the matching pair on the table in front of her/him. (The match is made when the pictures on the cards are the same. No two proverb cards have the same picture.) This part of the game ends when the players have made matches with all pairs.

If a player loses all the cards in her/his hand, s/he may draw one from the deck to keep in the game. S/He would get another turn if s/he lost all her/his cards when s/he laid down pairs.

Each player gets 10 points for every proverb card s/he has matched.

The game then continues on the story board. It should be placed in the middle of the table. One player deals the sticker cards to each one in the game. S/he should match them with the proverb cards. With the proverb cards and matching sticker cards in front of them, each player then proceeds to read her/his own story card. (It is not necessary to take turns in this part of the game.) The story cards match the story board, not only by the numbers but in the stories also. The players then proceed to find which of the 15 stories match the pair or pairs of proverbs. The player then places the small sticker card on the story board in the square s/he thinks matches the proverb. More than one card may be placed on a story. When all players have finished placing their stickers on the story board, the players check their answers with the answer card. Those sticker cards placed in the wrong square of the story board should be removed.

For each correctly matched proverb and story, the player receives 10 points. The player with the most points from both games is the winner.

A good follow-up to this game would be to make up your own proverbs.

Math Concentration

Number of Players: 2

Object of the Game: To match as many math problems with their answers as possible.

Rules: All number problems and answer cards are turned face down on the board. The player starting the game turns over any card on the board. S/He then turns over another card in hopes of finding either the problem or answer which would match the card s/he first turned over. If there is no match the player then
Math Concentration (Cont.)

turns both cards face down and the second player takes a turn and proceeds to turn over two cards. Each player tries to remember the placement of the number problems or answer cards in order to make a match. When a matching pair does occur, the two matching cards are taken off the board by the player and placed in front of her/him. The game ends when all pairs have been matched. The player with the most pairs wins. Note: Each card must be turned over completely and placed face-up on the board so that each player may see the cards.

In math concentration, every card is marked on the reverse side to indicate which times table is on the board. More than one set of times tables must be used in order to fill up the board. If a player should happen to make a match by using an answer or problem card from another table, s/he should be given credit for the match. There will, however, be some cards left on the board at the end of the game that don't match.

If only one set of times tables is preferred, the playing board may be used in a 4 x 5 combination of squares or the game may be played completely off the board.

How to Make: A board is marked off in 2-inch squares in a 5 x 6 (30 squares) or a 4 x 5 (20 squares) matrix. Cards should be cut smaller than the squares on the board, approximately 1-3/4" x 1-3/4". Math problems and answers should be printed on one side, the number of the times table on the other side.

Multiplication Rummy

Materials: Twenty-seven cards with the following combination on them:

\[
\begin{array}{cccccccccccc}
2 & 2 & 2 & 2 & 2 & 3 & 3 & 3 & 3 & 3 & 4 & 4 & 4 \\
\times 2 & \times 3 & \times 4 & \times 5 & \times 6 & \times 7 & \times 2 & \times 3 & \times 4 & \times 5 & \times 6 & \times 7 & \times 2 & \times 3 & \times 4 \\
4 & 4 & 4 & 5 & 5 & 5 & 6 & 6 & 6 & 7 & 7 & 7 \\
\times 5 & \times 6 & \times 7 & \times 2 & \times 3 & \times 4 & \times 2 & \times 3 & \times 4 & \times 2 & \times 3 & \times 4 \\
\end{array}
\]

Twenty-seven additional cards with the following numbers on them, one number per card:

\[
\begin{array}{cccccccccccccccc}
4, 6, 6, 8, 8, 9, 10, 10, 12, 12, 12, 12, 12, 14, 14, 15, 15, 16, 18, 18, 20, 20, 21, 21, 24, 24, 28, and 28.
\end{array}
\]

Rules:

1. Mix the cards well. Then give 6 cards, one at a time, to each player. Put the rest of the cards in the middle of the table, face-down.

2. The player at the left of the dealer draws a card from the pack. S/he then looks at the 7 cards. S/he lays down all pairs. A pair is a question card and its answer card.
**Multiplication Rummy** (Cont.)

3. The player then takes a card that s/he does not want from her/his hand. This card is put face-up beside the pack in the center of the table.

4. The next player may pick up the discarded card, the card that was thrown away by the other player, or may draw a card from the top of the pack. Then s/he lays down all pairs and discards one card as the first player did.

5. In the same way each of the other players has a turn. If all cards in the center of the table are drawn, the pile of discard is turned over, and play continues as before. The player who gets rid of all cards first says "Rummy" and wins the game.

**Nursery Rhyme Arithmetic**

Read a nursery rhyme a line at a time to the players, who should write the lines, one under the other. When the writing is completed, the players should count the letters in each line and put that number out to the right of the line. When all are ready, tell the players what to do with each number. The correct answer to the problem depends upon the correct spelling, except when a player misspells a word but uses the correct number of letters; s/he may still get the right answer. Give a point for the correct answer and an extra point if all the words are spelled correctly.

1. Star light 9 2. Jack Sprat could 14
   Star bright x10 90 Eat no fat + 8 22
   First star + 9 99 History could +12 34
   I see tonight +11 9 Eat no lean - 9 25
   I wish I may + 9 18 So between x 9 225
   I wish I might x11 198 The two of them -12 213
   Have the wish -11 187 They licked x10 2130
   I wish tonight +12 The platter -10 2120
   Clean + 5

   **199** 424

3. One 3 4. Three 5
   Two + 3 6 Four + 4 9
   Button x 6 36 Close x 5 45
   Your - 4 32 The ÷ 3 15
   Shoe ÷ 4 36 Door - 4

   **8 11**
Fish

Materials: Fifty cards, five each of the numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9.

Players are dealt a hand of six cards which they are to try to make into books of number families. The number families are decided before the game begins. (A number family means a combination of two numbers which total whatever number has been decided. If 6 is the number, a book might consist of cards numbered 4 and 2, or 3 and 3, and so on.) New cards are added by asking fellow players for a certain number. If the player asked has the card, s/he gives it to the one calling; otherwise, s/he says "Fish" and the caller draws one card from the pile. The one who first makes all of the cards in her/his hand into "books" wins the game. Scores can also be kept by counting the books made by each player in each game and adding these numbers at the end of the playing period.

Sub-Add

Materials: Forty cards, four each of numbers 1 through 10.

The game is most fun when played by two people. Each player is dealt half of the pack. S/He stacks the cards face-down in front of he/himself.

Then the players turn up (at the same time) one of their cards. The player having the card with the smaller number should subtract that number from the number on opponent's card. If s/he gives a wrong answer, the opponent scores a point if s/he calls out the right answer. For example, if the player turns up a 4 and the opponent turns up a 10, the player subtracts 4 from 10. If the player says, "Six" s/he scores a point. If s/he says some other number and the opponent calls out six, the opponent gets the point. If both players turn cards having the same number, the first one who calls "Zero" wins the point.

The play on Sub continues until all the cards have been turned. Then the cards are shuffled for the next round of Add. As before, each player turns up one of her/his cards, and the one having the card with the smaller number starts the play. But now s/he should add the numbers on the cards. Two rounds make a game. The player with the most points wins.

Convergent Production Task Cards

Task cards created for use with the convergent production factor are presented on the following pages. Answers for exercises are presented at the end of the section.

The task cards have also been printed on a heavier stock and sets (Stock No. 41-S-9941) may be ordered through the Office of Material's Development, 293-8140.
USE THAT LETTER

This activity can be played with two or more players.

Players pick a letter and make sentences using words beginning with that letter. The longest sentence with the most words beginning with that letter wins. Examples:

(g) A goat got into the garden.
(m) Mary made many pictures.
(t) Tommy tried to tell time.

Make the game harder by choosing a blend. Examples:

(br) The brown branch is broken.
(ch) Charles chewed cherries.
TASK CARD 2

RHYMING WORDS

This activity can be played with two teams of two or more players or with two players.

Choose a word from the list below. Each player or team writes words that rhyme with the word. The player or team with the most real words wins.

- hop
- cat
- wing
- sail
- car
- well
- long
- cap
- back
- man
- wag
- tent
- mill
- sled
- think
- hit
- drum
- west
- took
- clock
- hand
- stick
- tip
- pan
- sad
- frog
- pot

Players may repeat the game using different words.
COMPOSE A TELEGRAM

Players needed: Three or more

One student says five letters. All the other students write the letters, and then compose a telegram, using the five letters as the first letters in the words. The first player to write a telegram wins and chooses the next set of letters.

Examples:

W M Y I T Will meet you in Texas.
B B B T M Baby boy born this morning.
P L A T O Plane leaves at ten o'clock.
LETTER TIC-TAC-TOE

Players needed: Three or more

Students make a tic-tac-toe square on paper. The caller names 9 letters, including some vowels. After the caller names each letter, the players write it in one of the squares. Students try to place letters to make words across and down. The caller does not look at the players' squares until the end of the game. Then the caller decides which player has the most actual words. That player is the winner. Example:

```
c a r
o i l
```
```
t r p
```
car, air, cot, oil
Duplicate the two columns of words below. Distribute to students. Ask them to write as many compound words as possible by combining words from the first and second columns. The first student to write all the compound words wins.

<table>
<thead>
<tr>
<th>after</th>
<th>noon</th>
</tr>
</thead>
<tbody>
<tr>
<td>every</td>
<td>foot</td>
</tr>
<tr>
<td>ever</td>
<td>thing</td>
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<tr>
<td>rail</td>
<td>green</td>
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<tr>
<td>bare</td>
<td>road</td>
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<tr>
<td>base</td>
<td>room</td>
</tr>
<tr>
<td>class</td>
<td>plane</td>
</tr>
<tr>
<td>down</td>
<td>ball</td>
</tr>
<tr>
<td>gold</td>
<td>town</td>
</tr>
<tr>
<td>air</td>
<td>fish</td>
</tr>
<tr>
<td>any</td>
<td>some</td>
</tr>
<tr>
<td>lone</td>
<td>ground</td>
</tr>
<tr>
<td>corn</td>
<td>where</td>
</tr>
<tr>
<td>play</td>
<td>house</td>
</tr>
<tr>
<td>club</td>
<td>field</td>
</tr>
</tbody>
</table>
ILLUSTRATING SENTENCES

Players needed: Two or more

Choose one of the sentences below and finish it. Draw a picture to illustrate the sentence. Write the sentence under the picture. Example: I feel light as a bubble.

Two students may choose the same sentence. Each tries to find different ways to end the sentence. The one with the most endings wins.

I feel light as a . . . . . bubble feather snowflake
My feet are as cold as . . . .
The house is as warm as . . . .
He's as big as . . . .
She was as gentle as . . . .
It was as dark as . . . .
I'm as hungry as . . . .
I'm as sleepy as . . . .
He's as mean as . . . .
He's as slow as . . . .
Players needed: Two or more

Each student takes a turn at the sentences below. If one student cannot write the answer the other student has a chance. Each correct answer receives one point.

1. Add a blend to make a color of the sky.  _ue
2. Add a blend to make a fruit.  _um
3. Add a blend to make a fairy-tale animal.  _agon
4. Add a blend to make the leader of our country.  _esident
5. Add a blend to make a circus funny man.  _own
6. Add a blend to make a color.  _een
7. Add a blend to make a tiny part of a branch.  _ig
8. Add a blend to make what is done with an axe.  _op
9. Add a blend to make a big boat.  _ip
10. Add a blend to make a bird.  _ow
A NINE TRICK (ZERO OR ZILLIONS)

Choose any group of numbers that add up to 9.
For example: 1 and 1 and 5 and 2
Write these numbers in any order you like.
For example: 2, 115

This number can always be divided by 9. Nothing left over! Every time!
It doesn't matter how many numbers you use in adding up to 9. (And you can put in as many zeros as you like.)
It doesn't matter in what order you write them. They can always be divided by 9.

Does it work with nine 1s? Let's see!

\[
\begin{array}{c}
12345679 \\
9)11111111111111
\end{array}
\]

Yes, the answer comes out even. Let's use that number again: 12345679. (Notice that it has no 8.)

Now try this on a friend.
MAGIC WITH NUMBERS

Directions:
Write down your telephone number.

Multiply that number by 2.

Add 5.

Multiply the result by 50.

Add your age to the total and add the number of days in a year (365).

When this has been totaled, subtract the key number (615) from it.

It will be found that of the remaining figures, the last two will show your age and the first figures your telephone number.
Puzzle Boxes

1. Copy the numbers as shown. Cross out six digits so that what remains will add to 20.

\[
\begin{array}{c}
111 \\
777 \\
999 \\
\hline
20
\end{array}
\]

2. Take the ten digits from 0 to 9 inclusive and arrange them in such a way that the result equals 1.

0 1 2 3 4 5 6 7 8 9
Palindromes are words or sentences that can be read forward and backward and still say the same thing. Examples:

MADAM, I'M ADAM
NOON

Numbers may be palindromes too. Examples:

676 is a palindrome

582 is not a palindrome but will become one by reversing the number and adding.

\[
\begin{align*}
582 & \quad 285 \\
& \quad 86
\end{align*}
\]

6996 is a palindrome. It took three steps to make a palindrome from the number 582. Choose a number that is not a palindrome; estimate the number of steps it will take to get to a palindrome. What is actual number of steps it took?
CASTING OUT NINES

This is a system of checking addition we have all learned along the way but put aside. Add a column of numbers. Then check for the correctness by casting out nines in each horizontal column. The sum of what is left should equal the sum of what remains in the original sum.

\[
\begin{align*}
3 & 9 & 6 & 5 = 5 \\
4 & 5 & 8 & 1 = 0 = 6 \\
2 & 3 & 4 & 1 = 1 \\
1 & 0 & 8 & 8 & 7 \\
6 & = & 6
\end{align*}
\]

What number would be cast out in base 5?
LINEUPS

The number of ways 10 people can be lined up in a single file is given by the product $10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$. Find this number.

35
EMPLOYEE WAGES

The neighborhood grocer employs three clerks, each of whom receives wages of $54.20 a week. Also employed is a delivery person whose wages are $18.75 a week. How much does the grocer pay in wages each week? How much does the grocer pay in wages in a year?
Classify each of these words into one of two classifications, black or white.

- alabaster
- raven
- cream
- day
- dull
- albino
- dark
- jet

- pale
- light
- bright
- ivory
- night
- ebony
- sable
Task Card 5
afternoon     baseball    downtown
everything   clubhouse    cornfield
airplane     classroom    evergreen
anywhere     lonesome    goldfish
barefoot     railroad    playground

Task Card 7
blue
plum
dragon
president
clown
green
twig
chop
ship
crow
DIVERGENT PRODUCTION

INTRODUCTION

Code-D Color - Orange

Divergent production is, according to J. P. Guilford, the "generation of information from given information where the emphasis is upon variety and quality of output from the same source. This operation is most clearly involved in aptitudes of creative potential."

Divergent activities need to be more than one hour of art at the end of the day. Divergent production should be a pervasive process that constantly presents the students with creative problem-solving in all areas, looking at the familiar in new ways, then generating new ideas.

Most of the creative thinking that is generated in the classroom is product-oriented rather than process oriented. The Structure of Intellect approach to teaching the creative process is through the development of the following components:

- **FLUENCY** - Quantity of responses. The ability to generate a ready flow of ideas as in brainstorming.
- **FLEXIBILITY** - To take a different approach. The ability to use many different approaches or strategies in solving a problem; the willingness to change direction and modify given information.
- **ORIGINALITY** - To think in unique ways. The ability to produce clever and unusual responses.
- **ELABORATION** - To add onto. The ability to expand, develop, and embellish one's ideas.

To be successful in the divergent process, one must be in an environment free from threat and judgment, and must have a willingness to be and become. This operation is often more difficult for students who find success in right answers. It is the responsibility of the teacher to create an environment in which children feel free to say, "This is the way I'm doing it." rather than always saying "Am I doing it the right way?"

Creativity is a product of:

- Rich experiences
- Trust in self
- Openness to data
- Attitudes that value change
- Freedom from threat
- Willingness to be and become
WHY TEACH CREATIVITY?

TORRANCE: "Creativity has long been considered the highest form of mental functioning and human development. We now realize that available general tests of mental ability do not measure accurately creative capacities or potentialities. We now know that creativity is a form of behavior that basically has to be learned. Especially exciting to teachers is the fact that certain instructional strategies are more effective than others in producing creative responses in students."

GUILFORD: "It has been abundantly shown that creative thinking skills can be substantially increased by means of proper treatments. The first thing is to realize that creative thinking is not just one mental function; it comprises quite a variety of things."

TAYLOR: "Young people who have many experiences in turning on their creative talents will then likely use them to function effectively throughout their lifetimes. Contrarily, those students who establish non-creative patterns may continue to use only non-creative processes for the rest of their lives."

WILLIAMS: "Creativity is not possessed by only a few. It is universally found in every person and exists in a matter of degree. Every child has some creative potential; some have more than others. There is a difference in teaching creatively and teaching for creativity."

PARNES: "Although there is much emphasis on creative teaching (the imaginative use of materials by a teacher), relatively less emphasis is being placed on the development of creative behavior in the student."

GOWAN: "On any kind of creative scale used, some individuals are found whose creative production exceeds that of their fellows, not by percentages, or even simple magnitudes; but it is more likely ten, fifty, or a hundred times as great. Obviously, these fortunately creative persons are not much different. Something has happened to turn them on."
GLOSSARY FOR SOI FACTOR DEFINITIONS FOR DIVERGENT PRODUCTION

(WISC-R Analysis)

DFC - Reclassifies perceived objects in various ways

DSU - Produces words fulfilling specified structural requirements

DSR - Generates a variety of relations between numbers or letters

DSS - Produces symbolic systems in unique ways

DST - Divergent production of transformations made to symbolic material

DMU - Ability to call up many ideas in a specified class

DMR - Produces words from given words as synonyms, or as associated words

DMS - Analogical completions

DMT - Ability to produce remotely associated, clever, or uncommon responses

DMI - Specifies details that develop a scheme or variation of an idea
<table>
<thead>
<tr>
<th>DIVERGENT PRODUCTION</th>
<th>F</th>
<th>S</th>
<th>M</th>
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<tr>
<td>U</td>
<td>DFU</td>
<td>.DSU</td>
<td>.DMU</td>
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<tr>
<td>Elaboration--Make many designs from figures</td>
<td>Create Words</td>
<td>Unusual Uses--Broad Categories</td>
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<td>Rapid Retrieval of Ideas</td>
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<td>C</td>
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<td>DSC</td>
<td>DMC</td>
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<td>Regroup and Reclass Figures, Open-ended</td>
<td>Classification of Words, Letters and Numbers in Various Ways</td>
<td>Codes, Various Uses</td>
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<td>R</td>
<td>DFR</td>
<td>DSR</td>
<td>DMR</td>
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<td>Tie Dye Designs</td>
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<td>Create a Toy</td>
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<td>S</td>
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<td>Art--Construction</td>
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<td>Sentence Building</td>
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<td>Block Construction</td>
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<td>DFT</td>
<td>DST</td>
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<tr>
<td>Scribble Drawing</td>
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<td>Riddles</td>
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<td>Elaboration on Shapes</td>
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<td>Cartoon Responses</td>
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<tr>
<td>Manipulation of Shapes</td>
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<td>New Endings to Old Stories</td>
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<tr>
<td>I</td>
<td>DFI</td>
<td>DSI</td>
<td>DMI</td>
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<tr>
<td>Elaboration in Different Ways</td>
<td>Vocabulary Building, Change Letters</td>
<td>Implications to Stories</td>
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<tr>
<td>Imaginative and Geometric Drawings</td>
<td>Make Words from Big Words</td>
<td>Planning</td>
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<td></td>
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<td>Problem Solving</td>
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<td></td>
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<td>Semantic/Symbolic Elaboration</td>
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<td>Creative Writing</td>
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COMMERCIALY PREPARED MATERIALS

Many of the commercially prepared educational materials can be used to supplement the activities and materials developed for SOI operations. The following lists present materials which have been coded for the divergent production operation. In some cases, it was found that the materials could be used for several different cells in the SOI model and were coded accordingly. Additional cells (codes) are indicated in parentheses.

<table>
<thead>
<tr>
<th>Company</th>
<th>Materials</th>
<th>Code</th>
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</thead>
<tbody>
<tr>
<td>Instructo</td>
<td>Understanding Our Feelings</td>
<td>DMR, DMI</td>
</tr>
<tr>
<td>Play Doh</td>
<td>Play Doh</td>
<td>DFU</td>
</tr>
<tr>
<td>M. I. Toys</td>
<td>Plastic Building Blocks</td>
<td>DFU (NFU)</td>
</tr>
<tr>
<td>Colorforms</td>
<td>Little Red Riding Hood Colorforms</td>
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<tr>
<td>Toy Tinkers</td>
<td>Tinkertoys</td>
<td>DFS</td>
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<tr>
<td>Seichow and Richter Co.</td>
<td>Scrabble for Junior</td>
<td>DMU</td>
</tr>
<tr>
<td>Preschool Elementary Education</td>
<td>Cars, Trucks (Wood)</td>
<td>DFS</td>
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</table>

Books:

<table>
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<tr>
<th>Publisher</th>
<th>Title</th>
<th>Author</th>
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<tbody>
<tr>
<td>Little, Brown &amp; Co</td>
<td>The Book of Think</td>
<td>Marilyn Burns</td>
</tr>
<tr>
<td>Harper &amp; Row</td>
<td>Making It Strange 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Making It Strange 2</td>
<td></td>
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<tr>
<td></td>
<td>Making It Strange 3</td>
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<tr>
<td></td>
<td>Making It Strange 4</td>
<td>(A new design for creative thinking and writing.)</td>
</tr>
<tr>
<td>Incentive Publications, Inc.</td>
<td>I Can Make a Rainbow</td>
<td>Marjorie Frank</td>
</tr>
<tr>
<td>2400 Crestmoor Dr.</td>
<td></td>
<td></td>
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<tr>
<td>Nashville, Tenn. 37205</td>
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</tr>
<tr>
<td>Kabyn Books</td>
<td>42 Ways to Have Fun with My Mind</td>
<td>Leif Fearn and Ursula Golisz-Benson</td>
</tr>
<tr>
<td>Box 19663</td>
<td>52 Ways to Have Fun with My Mind</td>
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<td>Navajo Station</td>
<td>62 Ways to Have Fun with My Mind</td>
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<td>San Diego, Calif. 92119</td>
<td>72 Ways to Have Fun with My Mind</td>
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<tr>
<td>Good Apple, Inc.</td>
<td>Dandylions Never Roar</td>
<td>Joe Wyman and Don Mitchell</td>
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<tr>
<td></td>
<td>Anything Can Happen</td>
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<tr>
<td></td>
<td>Imagination and Me (Records and Books)</td>
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</tr>
</tbody>
</table>
DIVERGENT PRODUCTION ACTIVITIES

Activities for the divergent production factor are presented on the following pages. The letters (code) in the upper right-hand corner correspond to the Divergent Production Activities Grid presented in the Introduction of Divergent Production section. The answers for one activity are presented at the end of the section.
IMPROVISE

See how many objects you can make from the circles below. A circle should be the main part of whatever you make. With pencil or crayon add lines to the circles to complete your picture. Your lines can be inside the circle, outside the circle, or both inside and outside the circle. Try to think of things that no one else in the class will think of. Make as many things as you can and put as many ideas as you can in each one. Add labels or titles if the identity of the object is not clear.
ELABORATE

Add to the figures below to make as many different pictures as you can.

Think up a story you could tell your friends or teacher about some of these pictures.

Which drawing do you like best? Repeat it here, only larger. Then add as many different new ideas to your drawing as you can.

Title: ____________________________
THINK TWICE

Why is a whistle like a teakettle?

Are they alike in any other way?

Why or why not?
Why is a crab like a hawk?
Are they alike in any other way?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Why or why not?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Are a crab and a clam alike? How?

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
The signs along our highways often use pictures or symbols to give directions to drivers. A good symbol should enable the driver to recognize its meaning instantly so that he/she knows what to do. Imagine that you are a designer who has been asked to design a symbol for each message below. Draw your symbols in the spaces provided.

- Bumpy Road
- Narrow Bridge
- Animal Crossing
- Slippery Road
WHAT AM I?
(Elaboration)

These designs may suggest many different things to different people. What does each one suggest to you? Write a sentence about each one. For instance, when my cousin turns somersaults, he looks like this:
Use the two figures above to make a drawing in each of the boxes below. Give each of your drawings a title. Try to make your drawings and titles as interesting and as unusual as possible. The figures can be placed anywhere in the box and can be turned in any direction. You may make the figures as big or as small as you like. Choose your favorite to draw on a large sheet of paper.

Title: **Blast off!**

Title: **The clown climbs the stairs.**
Elaborate upon the given lines in such a way that your work will result in something most people will recognize. The given marks must be included as part of the figure you create.
Colored pencils or crayons might add a nice touch! What can you make from these "makfrums"?

Think divergently!

"MAKFRUMS" (Originality)
Begin with an ordinary paper bag or a small cardboard box.

Create something unusual and original from your bag or box.

Remember to think:

- Fluency
- Flexibility
- Originality
- Elaboration.

Don't tell anyone what you are making.

Materials you might want to use:

- Rickrack
- Buttons
- Glue
- Stapler
- Sequins
- Pipe cleaners
- Scotch tape
- Masking tape
- Fabric
- Construction paper
- Newspaper
- String
- Cotton
- Yarn
- Scissors
- Thread.

Note to the teacher: Near the end of the activity stop the class and let students share what they are making. Discuss ways to elaborate to make their creations even more unusual.
AS A CLASS PROJECT, SEE HOW MUCH "JUNK" YOU CAN
COLLECT. (SEE LIST ON NEXT PAGE.) ALL OBJECTS
COLLECTED WILL BELONG TO THE CLASS. IF YOU BRING
SOME SPECIAL "JUNK" FOR YOUR OWN PROJECT, KEEP
IT SEPARATE.

SELECT THE "JUNK" YOU WANT TO USE.

BRAINSTORM ALL THE THINGS YOU COULD MAKE.

CREATE YOUR BEST IDEA. NAME IT.

EVALUATE YOUR INVENTIONS (See "Evaluation of Thinking."
Suggested "Junk" Items for Children to Bring to School

Pipe cleaners
Tabs from aluminum cans
Styrofoam packing materials
Thread, yarn, string
Material (fabric)
Metal objects (nuts, bolts, etc.)
Cardboard
Paper, paper cups
Parts of old toys
Wire
Used flash cubes
Paper clips
Bottle caps
Small bottles

Other Materials Needed
Newspapers (to cover desks)
Glue
Scissors
Crayons
Tape
Felt pens
Evaluation of Thinking

This evaluation may be an oral discussion or done in writing under the teacher's direction. Suggested questions to begin discussion:

1. Did you have an idea that you thought would work when you started?
2. Did you end up with the same idea that you started with?
3. If not, did your ideas change several times as you were creating?
4. Was it easy to shift your plans or were you frustrated when things didn't come out as you had planned?
5. Did you come up with any idea by chance or by accident? If so, did you build on that idea and add to it?
6. Did you try to combine unusual objects and use them in new ways? If so, how did they turn out?
7. Do you feel you learned anything about yourself from doing this? If so, what?
A CHINESE DRAWING

The drawing below is called a tangram (tang'ram) which means "Chinese drawing." It is a favorite puzzle among the Chinese people. Use the pattern below. Paste it on cardboard, and then cut the square into pieces as marked. See how many interesting patterns or designs you can make, using all seven pieces. Over 300 can be made!

Other tangram tasks:
- Form letters of the alphabet with the Tangram pieces.
- Form an animal using all of the pieces.

Set a time limit of 15 minutes. Create as many objects as you can in the time limit. How many different things did you create?
CHANGING WORDS

Discuss rhyming words and words that begin and end alike.

Write the word makes on the chalkboard and have students respond orally with as many words as they can that contain the same vowels in the same order, but with different consonants.

Using "Words for Cards" (on the next page), give each student a card on which is written a simple word. Students list on paper as many words as they can that contain the vowels in the same order but with different consonants.

This activity can be repeated using nonsense words.
<table>
<thead>
<tr>
<th>table</th>
<th>crayon</th>
</tr>
</thead>
<tbody>
<tr>
<td>used</td>
<td>button</td>
</tr>
<tr>
<td>hole</td>
<td>tiger</td>
</tr>
<tr>
<td>frame</td>
<td>rope</td>
</tr>
<tr>
<td>poke</td>
<td>tale</td>
</tr>
<tr>
<td>cute</td>
<td>rice</td>
</tr>
<tr>
<td>paper</td>
<td>waste</td>
</tr>
</tbody>
</table>

bike

385
### Nonsense Words

<table>
<thead>
<tr>
<th>wedo</th>
<th>zemp</th>
</tr>
</thead>
<tbody>
<tr>
<td>goze</td>
<td>turzen</td>
</tr>
<tr>
<td>vofe</td>
<td>jabe</td>
</tr>
<tr>
<td>qidden</td>
<td>'kace</td>
</tr>
<tr>
<td>gare</td>
<td>wectob</td>
</tr>
<tr>
<td>yume</td>
<td>cime</td>
</tr>
<tr>
<td>fijke</td>
<td>hoje</td>
</tr>
<tr>
<td>binnen</td>
<td></td>
</tr>
</tbody>
</table>
FISH FOR NUMBER SENTENCES

Make as many number sentences as you can by using the numbers below.

Example
\[ 2 + 6 = 8 \]
Example
\[ 9 - 4 = 5 \]

Set a time limit.
See who can make the most sentences.
How many number sentences can you make from Bozo's balloons?

Example:

\[ 3 + 4 = 7 \]
\[ 2 \times 4 = 8 \]
Tom wants to buy the ball for 26¢. Write down all the different combinations of coins he could use. How many combinations are possible?
You can invent your own code. Fill in the blanks below, each with a different symbol.

```
| a | b | c | d | e | f | g | h | i | j | k | l | m |
```

```
| n | o | p | q | r | s | t | u | v | w | x | y | z |
```

Use your code to write a message, story, letter or note. Trade with a friend to decipher.
Construct your very own crossword puzzle using creative and clever clues.

Clues can be in the form of alliterations, rebus, similes, proverbs, or any other type of play on words.

Be original!

Note to the teacher: Some students may need to work with crossword puzzles prior to creating their own in order to become familiar with form and construction.
The ancient Egyptians sent messages to each other in pictures called **hieroglyphics**. Say: hy-ro-GLIF-ics. Use the symbols below to write a message. Notice that there are no pictures for the letters G, J, U, V, W, X, Y, and Z. Use our alphabet when you need to. Exchange messages with a friend and decode.
BRAINSTORMING

OSBORN'S FOUR BASIC RULES FOR GENERATING ALTERNATIVE HYPOTHESES

1. CRITICISM IS RULED OUT. Adverse judgment must be withheld until later. Judgment is deferred.

2. "FREE WHEELING" IS WELCOMED. The wilder the idea the better. It is easier to tame down than to think up. A wild idea may trigger just the "right" idea. A nonrational idea may suggest a sound, useful one.

3. QUANTITY IS DESIRED. The greater the number of ideas, the more the likelihood of winners. An obvious, small idea may stimulate an unusual, big idea.

4. COMBINATION AND IMPROVEMENT ARE SOUGHT. Hitchhiking is encouraged. In addition to contributing ideas of their own, group members should suggest how the ideas of others can be turned into BETTER ideas or how two or more ideas can be joined into still another idea.

IDEA SPURRING WORDS

S Substitute (material, color, function, quality, etc.)
C Combine (unite, join, embody, assimilate, blend, etc.)
A Adapt, add (conform, regulate, adjust, fit, etc.)
M Magnify (all, make larger, multiply, stronger, etc.)
Minify (subtract, divide, make smaller, etc.)
Modify (transform, alter, vary, moderate, etc.)
P Put to other uses (as is, altered, reversed, etc.)
E Eliminate
R Reverse (invert, transpose, other side, other end, etc.)
Rearrange (what are component parts, how else used, etc.)

With any idea the above spurring words can be used to enlarge your storehouse or pool of ideas, hypotheses, possible solutions, and so on.

Criterion: A yardstick, a standard of judging; a rule to test by which anything is tried in forming a correct judgment respecting it. Each hypothesis and every hypothesis is judged by one criterion and then by the second criterion and so on until every idea (hypothesis) has been evaluated by each criterion. Finally, a decision is made about the best hypothesis. Then an effort is made to improve this hypothesis and make it a better one.
Give each student a card, "How many ways..." (See following pages.)

Students record as many words as they can in three minutes.

Students pass cards and begin with a new card for three additional minutes.

Pass cards three to four times.

Share lists.

This activity can be repeated. Have the students brainstorm new "How many ways..." questions to be used.
"How many ways..."

<table>
<thead>
<tr>
<th>How many ways can a tree look?</th>
<th>How many ways can a castle look?</th>
</tr>
</thead>
<tbody>
<tr>
<td>How many ways can a lion roar?</td>
<td>How many ways can an apple look?</td>
</tr>
<tr>
<td>How many ways can a sunny day feel?</td>
<td>How many ways can a person speak?</td>
</tr>
</tbody>
</table>

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"How many ways..."

<table>
<thead>
<tr>
<th>How many ways can sandpaper feel?</th>
<th>How many ways can a haunted house look?</th>
</tr>
</thead>
<tbody>
<tr>
<td>How many ways can a camel move?</td>
<td>How many ways can a scream sound?</td>
</tr>
<tr>
<td>How many ways can an ice cream sundae taste?</td>
<td>How many ways can a fish swim?</td>
</tr>
</tbody>
</table>
ALTERNATE USES

We can often find uses for things that were originally intended for some other purpose. For example, children sometimes use old boxes for doll houses or as a place to keep their toys. For each of the following objects, list as many interesting and unusual uses as you can think of. Let your mind wander, and try to think of some uses that no one else has ever thought of. List all the ideas that come to mind, even if they seem silly or impractical. You may change the objects to suit your purposes. Use the back of this page if you need more space.

Old automobile tires

Cut them up and make sandals with the pieces.

Use them as hoops in a ring toss game for giants.

Old newspapers

30.
1. Think of all the possible ways you could get to school in the morning.

2. Think of all the ways you could peel a banana without using your hands.

3. Think of all the titles you can for a new popular song.
THE PAPER CLIP

Turn on your imagination and list as many different uses for a paper clip as you can think of. If you need more room, feel free to use the margins or continue on another sheet of paper. Do this activity by yourself or brainstorm with a small group.

1. 
2. 
3. 
4. 
5. 
6. 
7. 
8. 
9. 
10. 
11. 
12. 
13. 
14. 
15. 
16. 
17. 
18. 
19. 
20.
THE PENCIL

Turn on your imagination and list as many different uses for a pencil as you can. If you need more room, feel free to use the margins or continue on another sheet of paper. Do this activity by yourself or brainstorm with a small group.

1. ____________________________  11. ____________________________
2. ____________________________  12. ____________________________
3. ____________________________  13. ____________________________
4. ____________________________  14. ____________________________
5. ____________________________  15. ____________________________
6. ____________________________  16. ____________________________
7. ____________________________  17. ____________________________
8. ____________________________  18. ____________________________
9. ____________________________  19. ____________________________
10. ____________________________  20. ____________________________
WHAT EVERYONE SHOULD KNOW ABOUT BRAINSTORMING BUT WAS TOO BUSY TO ASK

I. Purposes of brainstorming:

A. To create a great number of ideas which lead to more quality in those ideas.
B. To open people up to sharing ideas without fear of criticism.
C. To enable members of the group to build on each other's ideas.

II. Procedure

A. The leader states a definite problem.
   1. Make it specific and simple.
   2. Examples:
      a. Name everything you can think of that is soft, white, and edible.
      b. What other uses can you think of for a TV tray?
      c. In what ways would you improve a school pencil to make it easier to use?

B. State the rules for brainstorming.
   1. No criticism. All ideas are accepted.
   2. Make your ideas free wheeling, as way out as you want to make them.
   3. Build on the ideas of others. Someone may give you an idea you can elaborate upon.

C. Restate the problem and as the children give their ideas, list them on the chalkboard with NO comment.

D. After 15 to 20 minutes, stop the brainstorming and comment on the amount and variety of responses.

E. Evaluate each idea by using standards you have set up, such as:
   1. Does it actually solve the problem, or does it create new ones? (Does it build or help society?)
   2. Is it possible to use the idea either now or in the near future? (Is it practical?)
   3. Are human beings really able to handle it? (Is it compatible with human beings?)

F. Leave on the chalkboard those ideas the children decide meet the criteria.

III. After brainstorming, discuss feelings and how the ideas came about.

IV. Each child may take any idea and develop it on his/her own by:

A. Making a labeled diagram or design of the idea or object.
B. Making a model of the idea.
C. Writing an explanation of his application of the idea.
D. Creating an "invention" of his own by combining the ideas from the chalkboard.
Making lists is another way to take on problems. Mostly people make lists to help them remember things. Like shopping lists. Or chores. Or homework assignments. Things that have to get done.

Another use for lists is to help you think. In two ways. By looking at things in different ways. By looking at things in more ways.

Here are some list-making warm-ups. You can do these exercises alone or with a friend. Comparing lists is fun. (Don't use skimpy pieces of scratch paper. Give yourself some space to list.)

**Things You Know**

These are things you need to pull out of your memory. The idea is to list lots. No time limit. Stop when you've thought of all you can.

- List all the foods you can think of that are yellow.
- List all the games you know for two people to play.
- List all the things that bug you.
- List all the ice cream flavors you can think of.

There are some things you should notice while you're listing. How did you get started? After you've listed all the easy ones, what did you do? How did you decide when to give up?
Things That Could Be

These lists are not of things you know. They are of things you could do with what you know. This time, set a time limit for each list. Two minutes.

List all the uses that could be made of an empty tin can.
List all the ways you could make a skateboard go uphill by itself.
List all the ways that a kid could earn money.
List all the things you could do to improve where you live.

How did this kind of list compare with the first warm-up? Did the time limit make a difference? Which lists were longer? Which were more fun to do?
FLUENCY GAME

Discuss the word fluency.

Divide the group into teams.

Assign a topic for the team to brainstorm, such as uses for an umbrella.

Allow 5 minutes for team brainstorming and listing.

Discuss lists and record ideas on chalkboard.

Students return to group and add to their lists something no one else has thought of.

Discuss: How does the second list differ from the first?
CRUNCH, MUNCH
(Fluency, Flexibility)

Some of the words in our language imitate sounds. Think about each sound listed below and then see if you can think of a few words that describe that sound. Don't be afraid to make up some words of your own. A few examples are given to help you get started.

The sound of people eating potato chips

\textit{crunch, munch, champ}

The sound of church bells ringing

The sound of logs burning in a fireplace

The sound of a typewriter in action

The sound of racing cars in a race
WRITING SOLUTIONS

Try writing some solutions to the situations listed below. See one situation to brainstorm at a time.

1. Write as many ways as possible to handle being lost in a cave and having laryngitis.

List as many ways as possible to get into your locked car without damaging any property.

3. How many ways can you think of to open a paint can that has a stuck lid?

4. How many ways can you think of to earn money for a bike?

5. How many ways can you think of to improve almost anything!
   - Your chair
   - Your teacher’s desk
   - A pencil
   - And on and on
INVENT AN ANIMAL

Study the imaginary animal pictured and described below, and then create your own imaginary animal, combining the attributes of two or more real animals. Draw a picture of your animal. Describe it and write a story about it.

(A) THE RABGERISH (Name of imaginary animal.)

(B) This is a timid, wild animal who loves to eat sea carrots. (Description.)

(C) As he was grazing around the bottom of the ocean munching on sea carrots, he stubbed his big toe. (What happens to it.)

(D) "My feet hurt!" (What it might say.)
ONE...

Finish this story. Use one or one as many times as you can.

One day Mary wanted to buy one gumball. Mary met one of her friends one block away from the store. Kathy said, "I have only 1 penny, Mary."

"That's funny. I have ____________________
_________________________
The first letter of each word is given below. Using these letters make 5 different sentences.

E m g f r
E m g f r
E m g f r
E m g f r
E m g f r

Many versions of this activity can be created by using different letters. Or write the letters on small squares and let students draw five letters.
TRIXIES

Trixies are disguised words. If you find the word I directly under the word stand you know that this represents "I understand." If you see the word shall in small letters enclosed in the word deed, you can correctly conclude that this combination is "shall indeed." To start you off, the answer to No. 1 is: "To overthrow the U.N. would incur a dark period in history."

1. Throw the UN IN wood CUR HISTORY

2. estimate whose ( ) Don't

3. The, g and the TEN slept

4. EX 28 AMS confident does SU not RE 6S

Hill

5. John Mass

6. VEST a fine MENT when UR* 0

7. Stand TEuND 2 Throw Taking my

8. She herself DIG with NATION
A LION STORY

A big lion came into the desk and ate all the walls. He was so shiny he never had enough to think so airplanes kept away from him. He galloped through the table, flew up to the door and hit his beak on the wastebasket. He was so long he met his stem as he came through the other window. He liked to sleep through the rain, but other chickens wouldn't talk to him. His squeak was out in the dark and so many people would not travel with him. He left the carpet and decided to go back to the bank and leave as he came in through the lamp. He was often in the chair but took good care of his ear.

Rewrite the above story, substituting your own words for the words in the story that do not make sense.

Share your stories with the class.
"I COULD HAVE BEEN, BUT..."

Discuss originality. Discuss the fact that the ability to transform words or ideas into clever or unusual responses is an asset to anyone's speech or writing. Try this activity:

Introduce examples of "I could have been, but..." The students should be asked to think up an unusual or clever response to the following examples:

I could have been a firecracker (but my pop wouldn't let me).
I could have been a chimney (but I wasn't allowed to smoke).

The teacher should point out that the antecedent must be related to the product or consequence.

Divide class into three to four groups and give each group three to four cards of antecedents. (See following pages for cards and possible solutions.)

Groups brainstorm for clever responses to antecedents.

After 10 minutes bring groups together to share their responses.

Break into groups once more to brainstorm their own antecedents and consequences or products.

Bring groups back once more to share their antecedents and consequences or products.
Antecedent Cards

1. I could have been a tower but _____

2. I would have been a knife but _____

3. I could have been the wind but _____

4. I could have been a tailor but _____

5. I could have been a steam roller but _____

6. I could have been a magician but _____

4 41 1
I would have been an electrician but  

I would have been a clock but  

I would have been an actor but  

I would have been a piece of elastic but  

I could have been a window but  

I could have been a door but  

7.  

8.  

9.  

10.  

11.  

12.
13. I could have been a light but ____

14. I could have been a circle but ____

15. I could have been a trumpet but ____

16. I could have been a picture but ____

17. I could have been a verb but ____

18. I could have been Tarzan but ____
Possible Solutions

1. ...I wouldn't stand for it.
2. ...I couldn't cut it.
3. ...I blew it.
4. ...it just didn't seem right.
5. ...it was too depressing.
6. ...my ambition kept disappearing.
7. ...the idea shocked my parents.
8. ...that was too alarming.
9. ...I couldn't play the part.
10. ...but that would be stretching it.
11. ...it was a real pane.
12. ...I wouldn't handle it.
13. ...I wasn't bright enough.
14. ...I wanted to go straight.
15. ...the idea was band.
16. ...I was framed.
17. ...I was too tense.
18. ...I couldn't swing it.
Notice the play on words in each example. Try to create more silly examples like these.

1. The artist who couldn't draw flies.
2. The owl that doesn't give a hoot.
3. The secretary who isn't the type.
4. The chauffeur who can't drive a nail.
5. The outfielder who couldn't catch a bus.
6. The undertaker who wouldn't bury the hatchet.
7. The dermatologist whose patients got under his skin.
8. The puppeteer who wouldn't string along.
9. The butcher who made cutting remarks.
10. The weight-lifter who couldn't raise the rent.
ALLITERATIONS

An alliteration is the placing together of two or more words beginning with the same or closely similar words.

Short Alliterations

1. Busy bee
2. Fair or foul
3. Higgledy-piggledy
4. Now or never
5. Spick and span

Long Alliterations

1. A noise annoys an oyster but a noisy noise annoys an oyster more.
2. How much wood would a wood chuck chuck, if a wood chuck could chuck wood.

Longer Alliterations

1. She sells sea shells on the sea shore. The shells she sells are sea shells I'm sure; and if she sells sea shells on the sea shore then I'm sure she sells sea shore shells.

2. Swan swam over the sea
   Swim, swim
   Swan swam back again
   Well swum, swan!

3. A skunk stood on a stump. The stump thunk the skunk stunk
   But the skunk thunk the stump stunk.

Alliterative Proverbs

Many proverbs owe much of their popularity to alliterative appeal. Not only do like sounds please the ear, but they assist the memory. Here are a few:

1. The fat is in the fire.
2. As fit as a fiddle.
3. Last but not least.
4. Practice what you preach.
5. A barking dog seldom bites.

Now see what you can do. Be divergent and think up some alliterations and alliterative proverbs of your own.
STRETCHING EXERCISES

What FOOD is like SHOE LACES?

Why?

A SNOW-TOPPED MOUNTAIN is like

because

What ANIMAL do you think is like a BALL?

Why?

What LIVING THING do you think is like a BULLDOZER?

Why?
WHAT AN IMPROVEMENT!!!!

Try to use your originality and flexibility in making some object better. Remember some of the things you can do to improve on what we have now.

Look at the attributes (characteristics) of the object and decide how you could change them.

- Magnify the object or its parts.
- Minify.
- Add other things to the object.
- Subtract and substitute other materials, colors, designs.
- Arrange the parts of the object in better places.

NOW select one object from below by placing your pencil in the middle of the circle and giving it one twist. Where your pencil lead points will determine your object.

S H O E S

Automobile
Electric Lamp
Record Player
Dog Food
Bicycle
Telephone
Bed
YoYo

Textbook
Pen

Ice Cream Cone
Baseball Mitt

Address Label
Coat or Jacket

Bathroom Scale

Next, brainstorm all improvements you can find. Then, design and label your improved objects.
WHICH IS FASTER - A TABLE OR A CHAIR?

In this lesson you will compare things that usually are not compared, so let your imagination guide you. There are no right or wrong answers. Pick the word that excites you, and circle it. Then explain your choice.

Which LASTS longer?

AN ICE CUBE

A COOKIE.

Why?

Which is QUIETER?

A KNIFE

A WHISPER.

Why?
Which WEIGHS more?

A SCREAM

A BAG OF POTATOES

Why?

Which is FASTER?

A TABLE

A CHAIR

Why?
ASSIGNING REASONS TEST

Below are some questions to which you are asked to assign short, one-line reasons. Your reasons should be plausible, although it is perfectly all right if they are unusual. A good reason is one which after hearing it, the listener might say, "Yes, that is a distinct possibility which I didn't think of."

Example: A agreed to sell B his car and B agreed to buy it. But when A brought the car to B's house, no sale was made. Why?

a) B had died.
b) B had disappeared.
c) B went back on his word.
d) The car was not in the shape A had represented it to be.
e) A did not have full title to the car.

Remember to make your answers both plausible and unusual. Keep them short.

1. Why do people wear clothes?
   a) _____________________________
   b) _____________________________
   c) _____________________________
   d) _____________________________
   e) _____________________________

2. Why did Miss Jones quit teaching?
   a) _____________________________
   b) _____________________________
   c) _____________________________
   d) _____________________________
   e) _____________________________

3. B wished to buy meat, and S, a storekeeper who had meat on hand, wished to sell some. But no sale took place. Why?
   a) _____________________________
   b) _____________________________
   c) _____________________________
   d) _____________________________
   e) _____________________________
Assigning Reasons Test (page 2)

4. C was a candidate for president of a club. In the balloting no one received more votes than C, yet C did not become president. Why?
   a) ____________________________
   b) ____________________________
   c) ____________________________
   d) ____________________________
   e) ____________________________

5. A bank was informed that a robbery was going to take place. Nevertheless the robbery was carried off successfully and the robbers escaped. Why?
   a) ____________________________
   b) ____________________________
   c) ____________________________
   d) ____________________________
   e) ____________________________

6. A policeman finds B dead on the street and A near the scene with a gun in hand. A later admitted that he shot B, yet A escaped an indictment for murder. Why?
   a) ____________________________
   b) ____________________________
   c) ____________________________
   d) ____________________________
   e) ____________________________

7. A man performed a certain act which, while legal and not immoral or injurious, was both unnecessary and unprofitable to him or to any other person. Why?
   a) ____________________________
   b) ____________________________
   c) ____________________________
   d) ____________________________
   e) ____________________________
8. A game hunter spared the life of an elephant he encountered. Why?
   a) 
   b) 
   c) 
   d) 
   e) 

9. X loved Y more than Z but married Z. Why?
   a) 
   b) 
   c) 
   d) 
   e) 

10. An old man had three children, A, B, and C. A and B were generally considered to be more worthy than C. Yet, when the old man died, he left all his estate to C. Why?
   a) 
   b) 
   c) 
   d)
Letting Your Mind Run Wild

There are times when thinking crazy on purpose is a good idea. Not acting crazy, thinking crazy. You can let your mind run wild in different ways. Try these running wild exercises.

Make a list. The topic is: What this world needs is . . .

See how many possibilities you can think of.

Lots of things might have been invented just that way. Who ever thought there could be an oven that could boil water in a cup without the cup getting hot, that could bake a potato in four minutes? Who ever thought there could be a machine small enough to fit in your hand that could do all your arithmetic for you? Someone did. The ideas may have seemed crazy at one time. But they came true. How many things in science fiction stories have come true?

If you like to draw, try these. Draw a solution for each of these problems.

A machine that would automatically make your bed in the morning.
A machine that would help you go to sleep.
A peach picking machine.
A machine that would turn the pages of a book when you’re reading in bed and your hands are cold.
ELABORATE ON THIS...

1. The children work in groups of 4-6 people.
2. One child is chosen to be the recorder.
3. Another child reads the first line of the story aloud. (See next page for story lines.)
4. Then each child adds a line to the story as the recorder writes it down.
5. After a group is finished (times will vary), the recorder reads the story aloud to be sure it makes sense and follows in sequence.
6. The group then plans how to present the story to the other children. Some possibilities are:
   - Read the story aloud (various children read different parts).
   - Have a narrator and others pantomime.
   - Dramatize the story.
   - Any other ways the children decide to present it.
"It's not so bad being a giraffe," said Hermann to Abigail as they loped across the plains of Africa.

As he looked into the kitchen window of the house next door, Rob thought, "Boy, nobody will ever believe this!"

Randy Rightguard decided he must see a doctor. Not that anything major was wrong with him. It was just that his sense of smell and taste were beginning to act strangely.

Judy didn't know what to do. She had just gotten out of bed, looked in the mirror, and discovered she couldn't see herself.

After searching for fifteen years and a great deal of hardship, Dr. Art Fact was ready for his reward. The door to the tomb had been cleared of debris and he stood ready to open it.

The night was dark and gloomy as Ezra Dimlitt walked the mile and one-half from his bus stop to his home.

Today was a great day for Emma Golightly. At last she had a chance to stay home and get her house cleaned. When the doorbell rang she happily went to the door and opened it widely. Her smile froze on her face when she saw who was there.

As Sam R. Salt, the great trapeze artist, swung across the main ring of the circus, he looked over at his landing platform and gasped.

Fishing was Phillet's only pleasure in life. He'd taken his gear up to his favorite lake and was now enjoying the excitement of trying to land a big one. Suddenly, Phillet heard a strange noise in the water next to his boat. As he turned around he saw the strangest thing happening in the lake.

Hi Tyme loved the adventure of being an explorer, but this was becoming one of the worst moments of his life.
CONSEQUENCES
(Originality, Elaboration)

Sometimes it is fun to let your mind wander and imagine all the things that would happen if an unusual situation were to occur. For each of the following situations, list as many possible consequences as you can think of.

What would happen if there were no such thing as darkness or night? Two examples are given.

Cars would not need headlights.
People who stayed up late would not be called "night owls."

What would happen if automobiles were completely banned tomorrow because of pollution?
DANCE OF THE BOXES

In this lesson let your mind wander from word to word. The first word will be given to you. Write in the word or words it makes you think of.

For example, when you see the word SMOKE you might think of FIRE. What other word does SMOKE make you think of? Choose a word that doesn't mean the same thing as FIRE. Write it in the blank box.

Now try one on your own.

What two words come to mind when you think of the word TRAIN?

Let your imagination go, and see where your two words take you.

It is fun to see what word comes to mind after you have looked at two other words. For example, what do you think of when you see the words FLAT and HOT? Write your answer in the blank box.

Use the word WAX to start this Dance of the Boxes.

Try a Super Box Dance!
Just follow the lines
and write your words in the blank boxes.

How is your last word like your first word?

How is it different?

ANSWERS

DMT-2 TRIXIES

1. To overthrow the U.N. would incur a dark period in history.
2. Don't underestimate whose parent this is (parenthesis).
3. The commodore overate and the captain overslept.
4. To be overconfident between exams does not insure success.
5. An address: John Underhill
   Andover, Massachusetts

6. A fine investment begins when you are asked to risk (asterisk) nothing.
7. I understand you intend to overthrow my undertaking.
8. She is beside herself with indignation.
Task cards created for use with the divergent production factor are presented on the following pages.

The task cards have also been printed on a heavier stock and sets (Stock No. 41-S-9941) may be ordered through the Office of Materials Development (telephone 293-8140).
GHOST SQUARES

Playing Board:

Make a 6" x 6" matrix of 36 squares ruled out on a piece of cardboard, laminated or covered with contact.

Rules:

The first player writes any letter in any square. The second player writes a letter in an adjoining square. If he/she can make a two-letter word, he/she scores two points, and draws a line through the word. If not, Player 1 tries to complete the word, earning three points (because it is a three-letter word), and so on.

The person finishing the word starts a new word. At the end of the playing time, the person with the highest score wins.
SILLY SIMILES

Playing Board:

Provide an 8-inch square piece of cardboard on which has been drawn a 4" x 4" matrix or 16 two-inch squares. Inside each square write the start of similes such as: Big as, Brown as, Little as, etc. A spinner is sectioned off into triangles with the numbers 1 through 8.

Materials Needed:

- Paper
- Pencil
- Board of phrases
- Spinner

Object:

To see how many similes and creative similes you can make using the phrases from the board.

Rules:

The game may be played as an individual activity or as a competitive game with other players at other boards. Two players may play at one board at a time.

To start the game each player chooses a different phrase from the board. Each one spins the dial. The number on which the spinner lands is the number of similes he or she must make from that one phrase. Players write similes such as "busy as a bee," "sly as a fox," and so on. As soon as the player is finished writing the similes, he/she chooses another phrase, spins the dial, and writes down the number of similes the spinner indicated. No player has to wait for another player in order to spin the dial. Proceed in this way, writing similes for three minutes. Everyone in the group then counts up the similes written. The one with the most similes wins the game. No player can choose the same phrase twice, nor may he/she write the same simile more than once.

To make the game more challenging, add some action or description after the comparison, for example: "Busy as" could be written "busy as a ball at a ping pong match" or "busy as a mouse in a cheese factory." The game is played in exactly the same way as before except when counting up the scores no points are given for one that is merely a straight comparison with no action or description added.

Time could be increased to five minutes at the beginning of the second part of this game if desired.
Object:

To write as many words as possible in three minutes to match the sentence as the wheel is turned.

Number of Players: 6

Materials Needed: 6 fluency wheels

How to Make:

Two large circles are cut out of tagboard for each wheel sectioned off into four sections. A sentence is written in each section such as: List everything that is white and round; How many ways can a bee sound? On the section of the wheel cut away one-fourth of the circle in pie-shape fashion. Put this circle on top of the typed circle and fasten together in the middle with a brad so that the cut away circle on top is easily moved.

Rules:

Each player is given a wheel, a piece of paper, and a pencil. At the word "Go," players turn the wheel to one of the four sentences. They write down as many words as possible that go with the sentence within three minutes. At the end of three minutes, time is called. The players turn to another sentence and start in writing words again for three minutes. The same procedure takes place again for the last two sentences. The player with the most words wins.
GAME PICTURES

Object:

To draw a meaningful picture and a title for each doodle within a one-minute time period.

Number of Players: Any number, 1-2 to each board

How to Make:

This is a board of 26 different squiggles within circles; the circles are placed on the paper in two ovals.

Rules:

One to two players to a board. Each player is given a 9" x 12" piece of paper. Instructions are given to fold the paper into eight squares.

Each player chooses a picture from the board. When the signal is given to start, each player draws a meaningful picture from the squiggle within one minute. Time is called. Players choose another picture and again, at the call of "Begin," draw another picture in another square within one minute. The same procedure is followed for the remaining six squares.

To add to the game a three-minute period could be given to give a meaningful title to each picture.

There is no winner in the game, but sharing of each response to each doodle makes the game a fun one.
**Object:**
To think of as many words as possible from the pairing of two words.

**Number of Players:** 2 or more

**How to Make:**
Draw a circle approximately 5-1/2" in diameter on a piece of cardboard. Think of 12 descriptive words or adjectives to place around the circle.

**Rules:**
One player throws one die to find the first attribute, the second player throws 2 dice to find the second attribute. Put the two attributes together and think of as many words as possible that have both attributes. For instance, you throw a 7 then an 11 "large and useful." How about a refrigerator, stove, air conditioner, train, and airplane? A time limit of five to 10 minutes for writing of the words may be set by the players.
SUBSTITUTION

Most card games are designed for a specific age group—simple games of guess and chance for young players, games of skill and strategy for older kids and adults. Here's a rare find. A solitaire game that's fun and easy for a six-year-old, yet intellectually stimulating (and sometimes quite difficult) even for "Einsteins." More good news. It takes only a few minutes to make, and about the same time to learn the rules.

Materials Needed:

Paper
Pencil (or crayon)

Tools: Scissors

Construction:

Cut about 20 small squares of paper. The exact size and quantity are unimportant. You might try cutting an index card in two. On half the cards draw a circle symbol, and on the remaining cards draw a square symbol. For easy recognition, especially if kids are playing, it's a good idea to give each symbol its own color, making for example, all circles blue and all squares red. These are the game cards. Now make the rule cards. Cut about ten larger strips of paper or use uncut index cards. On each of the strips write a circle and a square equation. Here are some examples chosen from the total number of possible permutations. Use these, or any of the other possibilities:

1. Professional
2. Player
3. User
4. Model
5. Script
6. Tool
7. Equipment
8. Apparatus
9. Instrument
10. Device
11. Instrument
12. Tool
13. Equipment
14. Apparatus

How to Play:

1. Shuffle the game cards.
2. Lay out all the game cards in a row, face up, in their shuffled order. We've chosen to use fourteen cards:

   ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●

3. Shuffle the rule cards, pick the top two, and place them below the row of game cards, face up:

   Game cards: ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●
   Rule cards: ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●
4. The object of the game is to use the substitution equations of the two rule cards to reduce the row of game cards to as few as possible. A single card remaining is the best you can do.

Here's an example of playing the game, using the card set-up which appears above.

1st play: Acting upon the substitution equation of the left-hand rule card, the player removes □□□ cards and substitutes a □ card:

2nd play: Using the left-hand substitution rule again:

3rd play: And again:

4th play: Now acting upon the right-hand substitution rule card:

5th play: Using the right-hand substitution rule again:

6th play: Now the left-hand:

7th play: Now the right:

8th play: Now the left again:

End of the game—no more substitutions can be made. Too bad, we're left with three cards:
Obviously, any specific combination of game and rule cards can have many different solutions, and the length of the starting line to some degree determines difficulty. A sophisticated player will plan strategies many moves ahead. If you want even more of a challenge, here are a few game variations:

Same game, but this time you're allowed to use the rule cards also in reverse, that is, you can use the equations to lengthen as well as shorten the row. The object is still to end up with the shortest row.

Start with a single game card and two rule cards. Try to lengthen the row to use all the game cards.

As a competitive game, have two or more players each with identical starting rows and rule cards. See who does best.
NUMBER ANIMALS

Make a number shape. Use the shape to make an animal. Turn the shapes on their sides or upside down. Use one shape or many shapes.

0123456789
NUMBER PEOPLE

Make a number shape. Then make a person.
You may use more than one.
THE AMAZING FOOL-PROOF EGG DROP DEVICE

A CONTEST !!!!!

Design a package to hold a raw egg so that when the egg is dropped from the roof of the school, it WILL NOT BREAK!!!

Be creative.

Use any materials you can find.

Have a prize for the winner.

*The package may also be tested by dropping it from the top of a ladder or from a second-story window.
WHAT IS THIS?

What is this? Where do you find it? Can it talk or sing? Color it. Put more lines on it and tell all about it.

Did you make up a story about this drawing? Do the new things you added help you make better descriptions in your story? Or give you new ideas for the whole story? Adding new ideas onto old ideas is called elaboration (ee-lab-o-Ray-shun).
EXAGGERATIONS

Read the sentences and underline any parts that you think are exaggerations.
Example: Paul Bunyan, the immense lumberjack, combed his hair with a cross-cut saw; he also brushed his beard with a small pine tree.

1. During the winter of the blue snow, Babe's mother was so distressed she ran away and left poor Babe in the snow.

2. Paul Bunyan took the forlorn little beast home although he thought a blue ox was a strange looking creature.

3. The lumberjack was so immense that he could not be measured in feet and inches.

4. The bunks for the men were in buildings as high as mountains.

5. Many of the lumberjacks used parachutes to get down from the upper bunks.

Use your own ideas for completing the story below: Exaggerate as much as you wish.

The men in Paul Bunyan's camp and all those at his macaroni farm often played jokes or tricks on each other. Usually they were careful not to play the kind of jokes or tricks that would make anyone feel distressed. But one joke that was played frightened one of the younger lumberjacks.

For several days after the young man arrived at the camp, he heard the other men talk about a ferocious beast that often came to the camp.

"It creeps in at night," said one man. "If it even touches a man, he cannot get away from it."

One night, when the young lumberjack got into his bunk, something clawed at him. He felt sure it was the queer beast of which he had heard. He leaped out of the bunk, but the beast seemed to leap with him. The young man yelled for help.

When the other lumberjacks laughed, the young man knew it was not the terrible beast that was clinging to him.

WHAT DO YOU THINK IT WAS?

Write an ending for this story.

Write some of your own exaggerations!
Write an advertisement for a teacher you want to hire.
List all the necessary qualifications.
What kind of person are you looking for?
What do you want him/her to do? Or to be?
What are your expectations?

Compare ads with those of your classmates. How do your ideas differ from others in the class?
WHICH DOOR WOULD YOU OPEN?

Illustrate three or more different doors (as in sample).

Brainstorm a list of all the different doors a person might enter in one day...

- A dentist's door
- A castle door
- A spaceship door
- A department store door

Create your own door out of construction paper.

Write about an adventure that happened to you when you entered your door.
Brainstorm all the fun things you can do with your hands.

Trace your hands on paper.

Cut out the tracings and write your ideas on them or illustrate your ideas on them.

Make a FLUENCY bulletin board!
?? WHAT IF... ??

-You had an eye on the end of your finger...
-A neck as long as a giraffe's...
-A nose on top of your head...
-Wings
-HU-U-U-U-U-U-U-U-U-GE feet...

Draw yourself with one of these new attributes. Write a story about your life.
INVENT A CLASSROOM PLANET

Task Card 16

Draw a classroom planet.
Give it a name, a money system, a culture, a government, and a code.
Who lives on this planet?
Write about your visit to it.
LOOK! IT'S A SCHNEEP!

Create your very own imaginary creature!!

Pretend it only visits Earth every 200 years and just today landed in your classroom. Or in your room at home.

Give it a name and physical characteristics.

Make drawings.

Build a creature domicile.

Make a zoo of everyone's creatures.

Classify them according to their attributes.
CREATIVE IDEAS ABOUT ANIMALS*

1. If you could have one pet, what pet would you choose? Why? How would you like to be treated if you were that pet?

2. You are an animal. Write a story from the point of view of an animal in a zoo; in the jungle; or in a forest.

3. Write a diary of the life (or a few days) of an animal.

4. Write a cinquain about an animal.

5. If you could be an animal, what traits would you like? (Run like deer, fly like hawk, eyes like eagle, think like man.)

6. Discuss ways that animals are alike and different. Consider wild animals and domestic animals. Discuss needs of pets.

7. Some people say we have too many pets. What would happen if we had no pets?

8. You wake up one morning and find you are a rabbit. How could this change you, and what are some of the things that might happen? How will your condition affect others?

9. You brought a lost animal home with you. What are some things that might happen?

10. Illustrate an animal nursery rhyme.

11. Draw cartoon (or just the blurb) showing animals in conversation.

12. Invent animals. Use parts of animals and make an imaginary animal. Decide what the animal would eat, where it would live, how it would communicate.

13. Show animal pictures. Have children describe the animals. Make up things the animals might be saying. Have the animal tell his story.

14. Someone offers you a Saint Bernard puppy. What objections would your parents have? What would you say to make them change their minds?

* From Igniting Creative Potential, Utah School Handbook, Calvin Taylor Workshop.
Create an ongoing writing center with the exciting element of chance.

Make four large tagboard (or chipboard) circles.

Each circle is sectioned and gives one story idea.

Students spin the wheels and where they stop determines the story elements.
HOW CAN YOU EXERCISE YOUR IDEA-FINDING POWERS?
(Selected from a list by Sidney J. Parnes and Alex Osborn)

1. Name at least six improvements which could be made on the common paint brush.

2. Name five inventions which the world could use to advantage, but which have not yet been invented.

3. What improvements in a bus would you suggest for the comfort and convenience of passengers?

4. If you had the job of drastically redesigning the 50c-piece, what would you suggest for the head and for the tail? Give your reasons.

5. What new ideas could be added to the game of baseball to make it more interesting and fun to play?

6. Write a twenty-word telegram to a friend telling about one day in a school.

7. Write a classified ad offering for sale a pocket-sized exercise kit, a bed-making machine, or a device to make toothpicks.

8. Name several things you could make by combining the items in each group:
   a. A volley ball and a steel spring
   b. 13 empty pop bottles and 72 ounces of water
   c. A board (1/2-inch thick and 3 feet square), a stick, and a hinge.

9. Describe an idea for a TV show which you think a lot of people would watch, but which has never been done before.

10. What would be the results if all people woke up one morning and found themselves twice as large?

11. If your neighbor's dog used your garden as a shortcut, how would you go about stopping this?

12. In what ways would you improve children's phonograph records?

13. Think of 10 uses for scotch tape that you have never heard of.

14. What parts of a home might be improved if they were curved instead of straight?

15. What ideas could you suggest to help a mother persuade her child to clean up his/her room?

16. Think of at least three ways to wake people up in the morning, gently but firmly.

17. Everyone has something that "bugs" him/her. Write down three of yours. Then make some creative suggestions as to what to do about them.
18. In what ways would our lives be affected if the wheel had never been invented?

19. Think of some better ways of collecting garbage in order to avoid the noise of the present system and unsightly cans or bags at the curb.

20. Make up a story which will include all the items in "a" or "b":
   a. A gray cat, a box of marshmallows, yesterday's newspaper, a pair of pajamas, a policeman
   b. A campfire, two gravediggers, a bowl of rice, a blueberry bush, and a clown.

21. Name a subject you have studied which seems useless to you. Now, make a list of possible uses for this subject. Try for ten ideas. Now try for 15 or 20. Now, what do you think of the subject?

22. Select a new title for each of 10 chapters in any of your textbooks. Make the title exciting enough to be a movie, but yet appropriate to the contents of the chapter.

23. Originate 10 new weird food concoctions.

24. Suppose you were developing an illustrated alphabet book for children who are very fond of automobiles and anything closely associated with them. Pick an "automobile" word for each letter of the alphabet. (You may use any subject of your choice.)

25. What 10 ways can you think of to encourage people to use less fuel and power in their everyday living?
EVALUATION

INTRODUCTION

Code - E  Color - Green

Evaluation is an area teachers tend to neglect in the classroom and the one area in which gifted students most often need remediation when diagnosed. Students should be provided an opportunity to make decisions and exercise judgments.

Students should have some time during the day when they decide how they will use their time. Younger children should be offered activities they may choose from, and the choice should be their decision. Sometimes students use poor judgment and evaluation in awareness of themselves and others. Many strategies can be used in the classroom to help with these situations. Sidney Simons' book *Values Clarification* and the self-awareness units developed by Project CHOICE for San Diego City Schools have many ideas which work well in the area of evaluation.

The activities presented in this guide have been developed for use in the evaluation factor. The guide is designed as a supplement for the materials developed by Dr. Meeker found in the SOI Abilities Workbook on Evaluation. The activities have not been written for any particular grade level. If the activity is not appropriate, the idea or technique can easily be adapted. Many of the activities can be adapted and changed to fit into other operations. For example, activities used in ESC could be used in NSC since evaluation and decision-making are used when sorting information to find the "right answer" in convergent production.

This section of the guide contains lists of materials which will be helpful in working with SOI and in developing materials to fit the SOI model. The blank grid can be used to plot the needs of students in a particular operation. (See Introduction section of the guide.) The names of students who need remediation in the area of EST should be recorded in that cell. A grid should be prepared in this way for each factor.

Games and other commercially prepared activities are used effectively within the SOI framework. Not only are these activities stimulating and exciting to the student, but they also offer another dimension to the SOI program. A list of materials available for Evaluation is presented in this section.

Following the coded activities, task cards for evaluation are presented. The task cards have not been cell-coded since they do not lend themselves to any one particular cell but to several.

Teachers may wish to put together games requiring logic and strategy for use in a classroom lab. These types of games fit very well into SOI since they require judgment and decision-making.
GLOSSARY FOR SOI FACTOR DEFINITIONS FOR EVALUATION
(WISC-R ANALYSIS)

EFU - Ability to identify identical forms
EFR - Ability to evaluate figural relationships
EFS - Ability to evaluate and decipher systems, beginnings, and ends
EFI - Sensitive to problems, spatial, seeing defects and deficiencies and suggesting improvements

ESR - Decides which symbol relations are consistent with others in a series

EMU - Ability to apply varied word meanings
EMR - Uses logical relationships in testing correctness of conclusion
EMS - Appraises aspects of common situations in terms of experience
EMT - Practical judgment about ideas
**GUILFORD'S OPERATION:**

- **Judgment, Planning, and Foresight**

### PRODUCTS

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<th>Classes</th>
<th>Relations</th>
<th>Systems</th>
<th>Transformations</th>
<th>Implications</th>
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</thead>
<tbody>
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<td><strong>SYMBOLIC (S)</strong> Number and Signs</td>
<td><strong>SEMANTIC (M)</strong> Words and Ideas</td>
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<tr>
<td>EFU—figure similarity</td>
<td>ESU-V—letter discriminant</td>
<td>EMU—match picture and word</td>
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<tr>
<td>EFU—vocabulary</td>
<td>ESU—letter patterns</td>
<td>EMU—descriptions</td>
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<tr>
<td>EFU—picture evaluation</td>
<td>ESU—visual discrimination</td>
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<tr>
<td>EFU—picture differ.</td>
<td>ESU—letter, count symbol</td>
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<tr>
<td>EFU—figure ground</td>
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<td>EFC—picture simil. and diff.</td>
<td>ESC—phonics</td>
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<td>EFC—picture classification</td>
<td>ESC—letter and number classification</td>
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<tr>
<td>EFC—class, color and sound</td>
<td>ESC—class, color and sound</td>
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<tr>
<td>EFC—taste simil. and diff.</td>
<td>ESC—number classification</td>
<td>EMC—concept classification</td>
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<td>EFC—form discrimination</td>
<td>ESC—ones, tens, hundreds, odd, even</td>
<td>word classification</td>
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<td>EFR—sequence of figures</td>
<td>ESR—equations</td>
<td>EMR—related words</td>
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<td>ESR—word pairs</td>
<td>EMR—reading comprehension</td>
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<td>ESR—non, word pairs</td>
<td>EMR—verbal analysis</td>
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<td>EFR—form discrimination</td>
<td>ESR—rank continuance</td>
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<td>EFS—construction of picture sequences</td>
<td>ESS—series which do not belong</td>
<td>EMS—sentence construction</td>
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<td>EFS—sequence, color and shades</td>
<td>ESS—letter sequence</td>
<td>EMS—picture absurd</td>
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<td>EFT—figure rotation</td>
<td>ESS—series, numbers</td>
<td>EMS—comprehension</td>
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<tr>
<td>EFT—figure transformation</td>
<td>EST—jumbled words</td>
<td>EMS—verbal absurd</td>
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<tr>
<td>EFT—plotting charts</td>
<td>EST—shapes and values</td>
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<td>EFI—figural sequence</td>
<td>ESI—abbreviations</td>
<td>EMT—cartoon punch lines</td>
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<td>ESI—letter consistency</td>
<td>EMT—unusual uses</td>
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<tr>
<td></td>
<td>ESI—map reasoning</td>
<td>EMT—word transformation</td>
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<td>EMT—pantomimes</td>
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<td></td>
<td></td>
<td>EMT—number transfer</td>
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</tbody>
</table>

From: Neeker, M. and Sexton, K. *SOI Abilities Workbooks*. Loyola University, Los Angeles 90045.
Many of the commercially prepared educational materials can be used to supplement the activities and materials developed for the SOI operations. The following list contains materials which have been coded for evaluation. This list was taken from a more extensive list compiled by the Austin State School in Austin, Texas for a PAR Project to classify educational materials for SOI. In some cases, it was found that the materials could be used for several different cells in the SOI model and were coded accordingly. Secondary uses are shown in parentheses.

<table>
<thead>
<tr>
<th>Company</th>
<th>Materials</th>
<th>Code</th>
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<tbody>
<tr>
<td>Instructo</td>
<td>Discovering Opposites</td>
<td>EFR (CFC, NFC)</td>
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<td>Magnetic Seasons</td>
<td>EMS (CMS)</td>
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<tr>
<td></td>
<td>Concept Builders (Food)</td>
<td>EFC (CFC, NFC)</td>
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<td>We Dress for the Weather</td>
<td>EFR, EM, EMI (CMI)</td>
</tr>
<tr>
<td>Trend Enterprises</td>
<td>What's Missing?</td>
<td>EFR (CFU, CFR)</td>
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<td>1-5 Tactile Placements</td>
<td>EFR (CFR, CSR)</td>
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<td>Same/Different Color</td>
<td>EFR</td>
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<tr>
<td>Milton Bradley</td>
<td>Space Relationship Cards</td>
<td>EFR, EM, EMI (CMR, CFR)</td>
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<td></td>
<td>Sequence Cards</td>
<td>EFR, EM (CMR, CFK)</td>
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<td>Phonetic Quizmo</td>
<td>EFR, EMS (CF, CMS)</td>
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<td></td>
<td>Homonym Poster Cards</td>
<td>EM, EMS (CM, CMR)</td>
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<td>Synonym Poster Cards</td>
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<td>Antonym</td>
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<td>EFU, EFR (CFU, CFR)</td>
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<td>Transportation and Communication</td>
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<td>Crossword Puzzle</td>
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<td>Plastic Measuring Jars</td>
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<td>Rhyming Puzzle</td>
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<td>Flannel Board Visual Aids (Good)</td>
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<td>Western Publishing Co.</td>
<td>Bead Frame SRA</td>
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<td>Hollensak</td>
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<td>Animals and Homes</td>
<td>EFR, EMR (CFR, CMR)</td>
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<td>People and Jobs</td>
<td>EFR, EMR (CFR, CMR)</td>
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<td>Colors and Shapes</td>
<td>EFR, EMR (CFR, CMR)</td>
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<td>ESR (CSR)</td>
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<td>Number-Shape Bingo</td>
<td>EFR (CSS, CFC)</td>
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<td>Classification of Happiness</td>
<td>EFC (CFC, CMC)</td>
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<td>Money in the Bank</td>
<td>ESR (CSS, CSR)</td>
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<td>Clocks (Different Time)</td>
<td>ESC (CSS)</td>
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<td>Card-Items with Price</td>
<td>ESC (CSU, CFU)</td>
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<td></td>
<td>Card (Food with Price)</td>
<td>ESR (CSU, CFU)</td>
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<tr>
<td></td>
<td>Addition-Subtraction Game</td>
<td>ESS (NSR)</td>
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<tr>
<td><strong>Educational Projects</strong></td>
<td>Season Learning Manual</td>
<td>EMS, EFU, EMR (NMR, CMR)</td>
</tr>
<tr>
<td><strong>Playschool</strong></td>
<td>Match-Up Puzzles</td>
<td>EMR, EFR, (CFR, CMR)</td>
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<td>Nested Blocks</td>
<td>EFR</td>
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<tr>
<td><strong>Garrard</strong></td>
<td>Who Gets It?</td>
<td>EMR, EFR (CFR, CMR)</td>
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<td>What the Letter Says (Dolch)</td>
<td>EMR, ESR (CMR, CSU)</td>
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<td><strong>Edu-Cards</strong></td>
<td>Zoo Lotto</td>
<td>EMR (CFU, CMR, CFR, CMU)</td>
</tr>
<tr>
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<td>What's Missing Lotto</td>
<td>EMU, EFU (CFU, CFR, CMU)</td>
</tr>
<tr>
<td></td>
<td>ABC Lotto</td>
<td>ESR (CSR, CFR, CMR, CSU, CMU, CFU)</td>
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<tr>
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<td>Farm Lotto</td>
<td>EMU, EFU (CFC, CMC, CFU, CFR, CMU)</td>
</tr>
<tr>
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<td>Go Together Lotto</td>
<td>EFR, EFU (CFR)</td>
</tr>
<tr>
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<td>Object Lotto</td>
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<td>Simple Object Bingo (Color Cued)</td>
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<td>The World About Us Lotto</td>
<td>EMU, EFU, (CFU, CFR, CMU)</td>
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<tr>
<td><strong>Milton Bradley</strong></td>
<td>Human Body Parts</td>
<td>EFR, EMR (CFR, CMR)</td>
</tr>
<tr>
<td><strong>Allied Educational</strong></td>
<td>O'Hare Starlite Program</td>
<td>EFU, ESU (CSU)</td>
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<tr>
<td><strong>Kenworthy Ed. Service</strong></td>
<td>Phono Rummy, Set A &amp; B</td>
<td>EMR (CMU, CMR)</td>
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<td><strong>Gellis-Widmer</strong></td>
<td>Play Way &quot;Look&quot; (Dolch)</td>
<td>EMR (CMR, CMU)</td>
</tr>
<tr>
<td><strong>Balcrum</strong></td>
<td>Sum Stick</td>
<td>ESR, EFI (CSS, NSR, CST)</td>
</tr>
</tbody>
</table>
The items listed below are needed to complete activities found in the *SOI Abilities Workbook* developed by Dr. Mary Meeker for the evaluation factor. The list is included to assist teachers in working with Meeker's materials. The list can be used as a shopping list for teachers or for requesting materials from students' families.

As teachers acquire these materials they should be labeled and placed in a central area for easy access for students, aides, and helpers. Teachers may wish to consider keeping the materials for each operation separate, for example, all materials for evaluation could be placed together in one large box. The materials could easily be stored when not being used.

1. 1 roll paper towels
2. 1 box 1/2" cubes, spheres, and cylinders (colored beads)
3. 2 skeins of knitting yarn (2 different colors)
4. Paper clips, 1/2 dozen, different sizes
5. 1 package pipe cleaners
6. 1 package compressed charcoal sticks
7. 2 dozen popsicle sticks
8. 1 box flat toothpicks
9. Scraps of cloth (good-sized, 12 different ones)
10. 1/2 dozen cardboard tubes from wrapping paper or towels
11. 1 roll of white rice paper or equivalent
12. 1 ball of string
13. 1 package of various buttons
14. Dried seed pods from San Diego trees
15. 2 small plastic film reels

**EVALUATION ACTIVITIES**

Activities for the evaluation factor are presented on the following pages. The letters (code) in the upper right-hand corner correspond to the Evaluation Activities Grid presented in the Introduction of the Evaluation section. The answers for activities are presented at the end of the section.
CROSS-OUTS

In the following boxes cross out the figure that is not the same as the rest.

1.  
2.  
3.  
4.  
5.  
6.  
7.  
8.  
9.  
10. 
11. 
12. 
### Finding Similarities

In the following boxes find the drawing that is the same as the first and circle it.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>3</td>
<td>4</td>
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<td>10</td>
<td>11</td>
</tr>
<tr>
<td>11</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>
FIND FOUR FIGURES

Find the four figures below together in this order and draw a circle around them.

- Figure 1: [Square with a dot in the center]
- Figure 2: [Square with a dot in the top right corner]
- Figure 3: [Square with a dot in the bottom left corner]
- Figure 4: [Square with a dot in the bottom right corner]
Circle the items that are yellow and round.

<table>
<thead>
<tr>
<th>egg yolk</th>
<th>sunflower</th>
<th>mustard seed</th>
</tr>
</thead>
<tbody>
<tr>
<td>lemon</td>
<td>peach</td>
<td>ear of corn</td>
</tr>
<tr>
<td>orange</td>
<td>ball of cheese</td>
<td>caution light</td>
</tr>
<tr>
<td>banana</td>
<td>baseball</td>
<td>dandelion</td>
</tr>
<tr>
<td>dip of lemon ice cream</td>
<td>rose</td>
<td>sun</td>
</tr>
</tbody>
</table>

Circle the items that make a sound.

<table>
<thead>
<tr>
<th>leaves</th>
<th>birds</th>
<th>stars</th>
</tr>
</thead>
<tbody>
<tr>
<td>hammer</td>
<td>stick</td>
<td>water</td>
</tr>
<tr>
<td>saw</td>
<td>light bulb</td>
<td>sun</td>
</tr>
<tr>
<td>wind</td>
<td>clock</td>
<td>rocks</td>
</tr>
<tr>
<td>flowers</td>
<td>snake in the grass</td>
<td>rain</td>
</tr>
<tr>
<td>clouds</td>
<td>fish</td>
<td>popcorn</td>
</tr>
<tr>
<td>snow</td>
<td>campfire</td>
<td></td>
</tr>
</tbody>
</table>
MEASUREMENT (SIMPLE)

Use rods cut from Set 1 (next page) to answer the following questions:

1. Which rod is the longer rod?  
   
2. Which rod is the shortest?  
   
3. Which rod is twice as long as Rod D?  
   
4. Which rod would you put with Rod C to make it the same length as Rod A?  
   
5. Which other two rods can you put together that would be the same length as Rod A?  
   
6. Which two rods would be the same length as Rod B?  

MEASUREMENT (COMPLEX)

Use the rods cut from Sets 1 and 2 (next page) to answer the following questions:

1. Which rod is half the length of Rod F?

2. Which rods would you add to Rod A to make it equal to Rod F?

3. Does Rod A compare to Rod F the same as Rod C compares to Rod H?

4. Is Rod C to Rod B the same as Rod E is to Rod D?

5. Does Rod B relate to Rod A as Rod H relates to Rod G?

6. Is Rod H to Rod C as Rod C is to Rod H?

7. Is Rod C to Rod I as Rod D is to Rod A?

8. Rod A is to Rod B as Rod I is to __________

9. Rod C is to Rod H as Rod D is to __________

10. Rod F is to Rod __________ as Rod __________ is to Rod D.
PATTERNS FOR RODS - SET 2

F

G

H

I
Cut out the small squares and fit them into the inserts on the picture.
MAP PUZZLE

Cut out the small squares and fit them into the inserts on the map.
COMPLETE THE SEQUENCE

Complete the missing sections of the figure sequence. Something has been added to each figure to make it different. You need to add the figures in the blank sections.
<table>
<thead>
<tr>
<th>1</th>
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<tr>
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<td>8</td>
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</table>
Circle the figure in the box that is the same as the one in the box at the left. Some of the figures are turned or "flipped."

<p>| | | |</p>
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</tbody>
</table>
PROBLEMS AND PUZZLES

Have you learned to look at a problem in more than one way?

Describe this picture.  Ask your friends to describe it.

Look at this picture.  What do you see?  What do your friends see?
Teacher explains the following instructions to the class:

1. Study the figures above.

2. With your back to the group, you are to instruct the students how to draw them.

3. Begin with the top square and describe each in succession, taking particular note of the relationship of each to the preceding one.

4. No questions are allowed.
Teacher explains the following instructions to the class:

1. Study the figures above.

2. Facing the group, you are to instruct the participants how to draw them.

3. Begin with the top square and describe each in succession, taking particular note of the relation of each to the preceding one.

4. Answer all questions from students and repeat if necessary.
1. Cut the squares apart.
2. Decide which of the squares would not go together to make a puzzle picture.
3. Put the squares together to make a puzzle picture.
KALAH

Materials

1. Playing board with 12 spaces in two rows with one larger space on each end as shown below. (Egg cartons with the Kalah space made by gluing half the top on either end is an easy solution for a playing board.)

   ![Kalah Diagram]

2. 36 beans or other playing pieces

Directions

1. Players sit facing one another with their Kalah on the right-hand side. Their spaces are the ones directly in front of them.

2. When learning to play the game, the players start with 36 beans distributed by threes into each of the 12 unmarked small spaces.

3. All moves are to be made by placing beans one by one in the spaces in a counterclockwise direction.

4. The starting player picks up all of the beans in one of her/his spaces.

5. S/he then places a bean into the next space (in a counterclockwise direction) and continues placing one bean in each space around the board continuing in the counterclockwise direction until s/he runs out of beans.

6. If there are enough beans, s/he should place one bean in her/his own Kalah. On the other hand, s/he may never place one of her/his beans in the opponent's Kalah.

7. If the last bean placed goes into the player's Kalah, s/he gets another turn.

8. When the last bean placed lands in an empty space on her/his own side, that bean plus those opposite in the opponent's space are placed in the player's own Kalah.

9. When a player empties all of the beans from the spaces on her/his side, the opponent then places in her/his own Kalah all the beans which remain on her/his side. (This means that one needs to be careful about going completely out, as it is not always to one's advantage.)

10. The winner is the one who ends up with the greater number of beans.
Example: This shows several moves at the start of a game.

1. Illustration I - Move to your own Kalah.

<table>
<thead>
<tr>
<th>Kalah</th>
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</table>

If a player (bottom side) starts by taking the encircled beans and placing them, s/he would place her/his last bean in her/his own Kalah and would get another turn.

2. Illustration II - Move to opponent's side.

The player with the triangle around her/his beans places them counterclockwise as shown.

Note: This is a version of one of the oldest known mathematical games. It is known to have been played throughout the East for 7,000 years. An interesting account of its history may be found in the May 5, 1964, Arithmetic Teacher, pp. 326-30.
COMPLETE THE DRAWINGS

Study the three items in the boxes. The figure in the top half is a clue to what belongs in the bottom half. Complete the series of drawings.
FIND THE PIECES

Draw a circle around the two figures in the right-hand box which will make the figures at the left.
MAKE A SQUARE

Cut out the five triangles and arrange them to make a square. Only one of the pieces may be cut into.
How many triangles are there in the figure below?

400
PUZZLE SQUARES

This activity may also be found in the area of comprehension. It is used here in the area of evaluation because of the decision-making process involved.

Preparation of Puzzle:

A puzzle set consists of five envelopes containing pieces of stiff paper cut into patterns that will cover 6-inch squares. Cut the squares into parts and lightly pencil the letters "a" through "j" as shown below. Then mark the envelopes A through E and distribute the pieces thus:

- Envelope A = j, h, e
- B = a, a, a, c
- C = a, i
- D = d, f
- E = g, b, f, c

Erase the small letters on the pieces and instead write the envelope letters A through E so that the pieces can be easily returned for reuse.

Several combinations of the pieces will form one or two squares, but only one combination will form five squares.

Instructions for Students:

Each person should have an envelope containing pieces for forming squares. At the signal the task of the group is to form five squares of equal size. The task is not complete until everyone has before him a perfect square and all the squares are of the same size.

These are the Rules:

1. No member may speak.
2. No member may signal in any way that he wants a card.
3. Members may give cards to others, BUT NO ONE MAY TAKE A PIECE OF A CARD FROM ANOTHER.
MOTHER BUNNY’S EGGS

Some one made mistakes on Mother Bunny’s eggs. Write the mistakes on a paper and correct them quickly.
1. Make a monster foot on a piece of construction paper. Make it BIG!

2. Measure with your monster foot to find out the distance or height in "monster feet" ...

   to the office _____ your best friend _____
   the classroom door _____ your teacher _____
   the chalkboard _____ You! _____
   your desk _____ the teacher's desk _____

What else can you measure?
HOW BIG ARE YOU?

Materials

Roving - a) 1 metre in length
b) 30 centimetres

With short length of roving measure and record --

-- the length of your foot (toe to heel)
-- around your foot
-- around your friend's foot
-- around your hand
-- around your friend's hand

<table>
<thead>
<tr>
<th>You</th>
<th>Friend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foot</td>
<td></td>
</tr>
<tr>
<td>Hand</td>
<td></td>
</tr>
<tr>
<td>Waist</td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td></td>
</tr>
</tbody>
</table>
HOW BIG IS IT?

Use the short length and long length of roving. Measure things in the room. Compare sizes.

- desks
- books
- chalkrail
- chairs

Anything else you can find.

Who would need measurements like these? Why?
HOW BIG ARE YOU?

Collect the height measurements of your group.

Discover:

1. Who is the tallest child in the group?

2. Who is the shortest child in the group?

For The Experts:

What is the average height of the members of your group?
FIND THE LETTERS

Draw a line around the letters UVMXLP below every time you find them in that order on the page. Read up and down and across, but not diagonally.

X  L  U  V  M  X  L  P  M  V
U  V  M  L  X  P  U  M  X  L
M  X  U  V  X  M  L  P  V  U
X  L  M  U  V  X  P  X  L  V
U  V  M  U  V  M  X  L  P  M
V  X  L  V  M  X  L  P  U  X
M  V  X  U  V  M  P  X  L  L
X  U  L  M  D  U  M  X  L  P
L  U  V  X  X  L  X  V  U  M
P  L  U  V  M  X  L  P  L  P
CIRCLE AND CROSS OUT

1. Circle the nine Ps with orange.
2. Cross out the six Gs.
3. Circle all the 9s in red.
4. Circle the three Ms in blue.
5. Cross out the Js in green.
6. Circle the five Ns in yellow.

P N G X P Y G Z
A B J M C J D P
E G F G H I K L
O R S T M U V W
X 9 3 G 2 B 4 P
5 N A B C 6 D 7
Y 1 Y Z J 8 D E
F P 8 N H I P K
L N O R T N U W
M X X R Y P Z Q
A B D F I W O X
C P E R H G P Y
SAME OR DIFFERENT? (SIMPLE)

Study each pair of figures and words to decide if they are the same or different. If they are the same, write S on the line; if different, write D.

1. 36          63
2. same        some
3. their       this
4. 42          42
5. 396         369
6. was         was
7. quiet       quite
8. saw         was
9. 68          86
10. 18         18
11. 210        201
12. to          too
13. went       want
14. come       come
15. hid         hide
16. 45          54
17. 13          13
18. bump        dump
19. bye         by
20. head        head

5'1
Which pairs below are the same, and which are different? Beside the pairs that are the same, write S; beside the pairs that are different, write D.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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<td>UZZ</td>
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<td>15</td>
<td>460 7624</td>
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502

495
FIND THE WORDS

Circle the words which are made up of the letters found in the given word.

1. Given: photosynthesis
   session histone
   totem optics

2. Given: chloroplast
   pastor roost
   locust cloth

3. Given: dichotomy
   idiom mood
   city tidy

4. Given: chameleon
   clean hence
   enamel enormous

5. Given: astronaut
   snatch unto
   start aunt

6. Given: publisher
   push rebus
   issue sulphur
VOWEL-CONSONANT ARRANGEMENT

Place the following words in the proper column according to their vowel and consonant arrangement.

- happen
- gasoline
- apart
- certain
- pilot
- collect
- soon
- pioneer
- care
- learn
- person
- different
- force
- free
- king
- silence
- pretend
- honest
- purple
- joke

<table>
<thead>
<tr>
<th>Double Vowel</th>
<th>V-C-V Vowel-Consonant-Vowel</th>
<th>C-V-C Consonant-Vowel-Consonant</th>
<th>Double Consonant</th>
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497
CLASSIFICATION BY MULTIPLES

Place the numbers in their proper classifications below.

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<tr>
<td>Multiples of both 3 and 6</td>
<td>Multiples of both 5 and 10</td>
<td>Numbers that are primes</td>
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</table>
CROSS OUT WORDS

In the groups of words below, one word does not belong. Find the word that does not sound like the rest and cross it out.

1. soak  choke  note  cloth
2. bland  came  swam  sand
3. juice  loose  lose  sluice
4. balloon  some  spoon  moon
5. slap  cable  cat  snap
6. chalk  hallow  walk  caught
7. school  loot  pool  cruel
8. box  knots  clocks  knock
9. bright  kite  knight  kink
10. stare  narrate  chair  store
11. lime  thyme  shine  quiet
12. gum  tomb  thumb  come
A WORD PUZZLE

Each word in the puzzle ends the same. Use the clues to make the right word.

Clues

1. What you do in the oven
2. The earth moves and shakes
3. A piece of wood
4. To capture
5. A crystal of snow
6. Something wrong
7. To take
8. Collection of ingredients
9. Not fully grown
10. Imaginative stories or writings
11. Your name in writing
12. Position of the body

1. ___ake
2. ___ake
3. ___ake
4. ___ake
5. ___ake
6. ___ake
7. ___ture
8. ___ture
9. ___ture
10. ___ture
11. ___ture
12. ___ture
WORD PAIRS

Circle the pair of words which is most like the given pair. Study the letters for your clue.

A. wheat-stern
   1. grin - deserve
   2. leave - field
   3. heal - germ

B. aim-diet
   1. dine - desk
   2. fears - three
   3. mail - field

C. nail-green
   1. remain - deer
   2. chin - cheese
   3. leave - strain

D. scene-cheese
   1. gleam - green
   2. depend - breeze
   3. ferry - lie

E. pioneer-happen
   1. pretend - pilot
   2. soon - purple
   3. free - different

F. silence-honest
   1. learn - joke
   2. pretend - person
   3. happen - soon

G. master-smarted
   1. lime - climb
   2. toads - total
   3. most - mist

H. stop-pots
   1. most - host
   2. heic - icke
   3. rat - tar

I. lept-slept
   1. bell - fell
   2. fell - fail
   3. love - glove

J. cake-make
   1. bell - tell
   2. tick - tock
   3. moose - mouse
FAMILY PICNIC

You are having a picnic in your backyard; 24 people will be there. Mother has asked your help. She wants you to buy:

- 6 pounds of hamburger
- 2 dozen hot dogs
- 2 dozen hot dog rolls
- 2 dozen hamburger buns

When you get to the store you find:

- Hot dogs - 10 in a package
- Hot dog rolls - 8 in a package
- Hamburger rolls - 8 in a package

1. How many packages of hot dogs will you buy? ____________________________

2. How many packages of hot dog rolls will you buy? ____________________________

3. How many packages of hamburger rolls will you buy? ____________________________

4. Which one did you have to buy extra of? ____________________________
LETTER RELATIONSHIPS

Look carefully at each given word. Can you find a relationship between the letters in the given word and one of the word pairs? Circle the pair that relates to the given word.

A. administer - adm
   1. savage - ave
   2. opaque - que
   3. density - den

B. transportation - tion
   1. celestial - tial
   2. foreign - ei
   3. voyage - vye

C. barbarian - ari
   1. gaunt - aum
   2. peculiarity - cul
   3. austere - ere

D. disguise - dise
   1. apathetic - thet
   2. reassure - eaur
   3. assert - aast

E. centimeter - meter
   1. symmetry - meter
   2. strength - ngth
   3. measurement - ment

F. pentagon - ptn
   1. triangular - lar
   2. polygon - oly
   3. mysterious - mts

G. lament - tnemal
   1. puzzle - elzzup
   2. motive - omtive
   3. feather - therfe

H. zealous-slanderous
   1. active - relative
   2. valor - brave
   3. fault - right
OUTDOOR ACTIVITY

Find the four-square play area. Measure the lines of the large square in meters. Record.

Measure the lines of the small squares in meters. Record.

Compare.
GEOMETRIC FIGURES

Study the different geometric figures and answer the questions that relate to the figure. Indicate whether that statement is true or false.

1. AB = 2 inches
2. AB = CD
3. The perimeter is 12 inches
4. The diameter is 4 inches
5. EG = EF
6. EG = 3 inches
7. EF = 3 inches
8. The perimeter is 10 inches
9. IJK is a right triangle
10. IJK is to LMN
11. MNL is 90°
12. OPQ is 90°
13. Radius is 2 inches
14. Diameter is 2 inches
15. RU = UT
16. RT = US
WHICH ONE?

Which one of the sets of numbers below follows the rule that is given? Write true in the blank if the rule was followed; write false if it was not.

1. Divide by 3, add 5.

   A. 12, 8, 15, 14, 11, 9  
   B. 3, 9, 23, 18, 11, 8  
   C. 10, 6, 19, 26, 14, 11

2. Add 3, multiply by 2.

   A. 6, 5, 8, 10, 13, 14, 32, 23  
   B. 7, 9, 16, 20, 22, 18, 23, 27  
   C. 10, 12, 14, 16, 18, 26, 22, 28

3. A number squared, plus 1.

   A. 17, 9, 4, 83, 24, 53, 12  
   B. 82, 26, 10, 17, 37, 65, 5  
   C. 16, 25, 50, 63, 81, 10, 17
WHICH ONE DOESN'T BELONG?

In each series of numbers in the exercise below, you will find one number that doesn't belong. Circle the number that doesn't follow the pattern of the other numbers.

1. 2, 4, -6, 8, 9, 10
2. 2, 3, 6, 9, 12, 15
3. 3, 9, 18, 27, 36
4. 10, 20, 25, 30, 40
5. 7, 14, 21, 28, 34, 42
6. 9, 18, 27, 36, 47, 54
7. 6, 12, 16, 18, 24, 30
8. 12, 24, 36, 48, 62
9. 1, 3, 7, 13, 17, 18, 23
10. 4, 6, 9, 16, 25
Happy Birthday!

Grandma phoned you to wish you a Happy Birthday.

It is Grandma's Birthday! Call Grandma and wish her a Happy Birthday. What time it is in New York?
## WORDS FROM WORDS

What words could be made from the given word. Write Yes beside the words that could be made from letters in the word, and No beside those that could not.

<table>
<thead>
<tr>
<th>1. disk</th>
<th>2. there</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. kids</td>
<td>a. here</td>
</tr>
<tr>
<td>b. slid</td>
<td>b. three</td>
</tr>
<tr>
<td>c. skid</td>
<td>c. their</td>
</tr>
<tr>
<td>d. hide</td>
<td>d. error</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>3. scold</th>
<th>4. deal</th>
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<tbody>
<tr>
<td>a. scale</td>
<td>a. lead</td>
</tr>
<tr>
<td>b. cold</td>
<td>b. dale</td>
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<tr>
<td>c. clods</td>
<td>c. dead</td>
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<tr>
<td>d. load</td>
<td>d. head</td>
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<table>
<thead>
<tr>
<th>5. glare</th>
<th>6. dare</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. large</td>
<td>a. earn</td>
</tr>
<tr>
<td>b. flare</td>
<td>b. dear</td>
</tr>
<tr>
<td>c. garage</td>
<td>c. read</td>
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<td>d. range</td>
<td>d. hare</td>
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<tr>
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<th>8. detour</th>
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<td>a. site</td>
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<tr>
<td>b. diced</td>
<td>b. routed</td>
</tr>
<tr>
<td>c. edits</td>
<td>c. toured</td>
</tr>
<tr>
<td>d. diets</td>
<td>d. detain</td>
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</tbody>
</table>
WHAT'S IN ASTRONAUT?

Most of the words listed below were made from the letters found in the word ASTRONAUT. Some could not have been made since ASTRONAUT does not contain all the letters. Circle the words that could not have come from the word ASTRONAUT.

aunt
auto
rant
rattan
roast
rout
route
sauna
short
snort
sour
star
start

starve
stoat
stunt
taro
taunt
taut
tost
trot
trust
tuna
turn
undo
unto
Words for Abbreviations

How are abbreviations decided? For the following list of abbreviations identify and write the full word or words for the abbreviation. Underline the letters in the complete word that make up the abbreviation. Do you find a relationship between the abbreviation and the words? Is the relationship the same for all abbreviations?

<table>
<thead>
<tr>
<th>No.</th>
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<th>Full Word</th>
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</table>
STATES ABBREVIATIONS

Write the abbreviations of the states in the blanks to the left of the names. Then write the abbreviations in their proper places on the map on the next page.

<table>
<thead>
<tr>
<th>State</th>
<th>Abbreviation</th>
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<tr>
<td>AK</td>
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<td>DC</td>
<td>KY</td>
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<tr>
<td>DE</td>
<td>LA</td>
</tr>
</tbody>
</table>

- Colorado
- Idaho
- Iowa
- Michigan
- Nebraska
- Arizona
- Illinois
- Kansas
- New Hampshire
- North Carolina
- Rhode Island
- Alabama
- Louisiana
- North Dakota
- California
- Pennsylvania
- Wyoming

- Hawaii
- Minnesota
- Ohio
- South Carolina
- Tennessee
- Missouri
- Virginia
- Washington
- South Dakota
- Mississippi
- Connecticut
- Massachusetts
- Nevada
- Delaware
- Indiana
- Kentucky
- New Mexico

- New York
- District of Columbia
- Maryland
- Alaska
- Florida
- Arkansas
- New Jersey
- Oklahoma
- Vermont
- Maine
- West Virginia
- Texas
- Montana
- Utah
- Oregon
- Georgia
- Wisconsin
SHORTENED SPELLINGS

Which of the words would the shortened spelling best fit. Circle the word which you think would most likely be associated with the abbreviation.

1. **Boldr**
   - Boulder
   - Boule
   - Bouillon

2. **Chalir**
   - Chevalier
   - Cheviot
   - Chevron

3. **Defme**
   - Defame
   - Default
   - Defect

4. **Enrge**
   - Encourage
   - Encrust
   - Encumber

5. **Hytts**
   - Hymenoptera
   - Hyonettees
   - Hymnist

6. **Lnguge**
   - Language
   - Languor
   - Laniferous

7. **Odus**
   - Odontology
   - Odorimeter
   - Odorous

8. **Rect**
   - Receipt
   - Reception
   - Recession

9. **Bambo**
   - Balustrade
   - Bamboo
   - Bandanna

10. **Consid**
    - Consider
    - Consigno
    - Consistent
CHOICES AND DESCRIPTIONS

Which of the four choices best fits the description? Underline the word that you think best fits.

A. Soft and white
   1. Vanilla ice cream
   2. Ice cube
   3. Pad of paper
   4. Box of tissues

B. Round and blue
   1. Orange
   2. Telephone book
   3. The sky
   4. A ball

C. Green and slimy
   1. Grass
   2. A frog
   3. A dollar bill
   4. Limes

D. Yellow and scratchy
   1. Vegetable brush
   2. Flower
   3. Lemon
   4. Stick of butter

E. Cold and sweet
   1. Ice cube
   2. Snow
   3. Ice cream cone
   4. The ocean

F. Soft and round
   1. Baseball
   2. Nerf ball
   3. Orange
   4. Marble

G. Hard and clear
   1. Brick wall
   2. Cellophane wrap
   3. Glass
   4. Water

H. Hard and rough
   1. Bark on a tree
   2. Baseball
   3. Whiskers
   4. Cement
THE STRAY WORD

In the group of words below you will find a word that does not belong because it is different in one way or another. Cross out the word that doesn't fit with the rest of the word group.

A. sing, hum, whistle, shout

B. soft, feathery, harsh, billowy

C. peaceful, thunderous, serene, quiet

D. violin, cello, flute, base violin

E. horse, cow, sheep, buffalo

F. electricity, candle, whale oil, fire

G. Los Angeles, San Francisco, San Diego, California

H. cry, sad, excited; sorrow

I. shirt, glove, hat, suitcase

J. magazine, newspaper, book, television

K. Bach, Beethoven, Beatles, Brahms

L. elephant, giraffe, ostrich, rhinoceros
A BANK ROBBERY MYSTERY

Directions

The clues (below) may be duplicated and cut apart or written on separate pieces of paper.

Participants are seated in a circle. The leader passes out the clues, one or more clue to each person. The leader explains that each of the pieces of paper contains one clue to help solve a bank robbery. The group has to find out from the clues the person or persons who robbed the bank of $1,000,000.

The group may organize in any way desired. Anytime someone thinks s/he knows the answers and the group agrees on the guess, s/he may tell the leader. The leader checks whether the answer is correct. If incorrect, the leader will not tell why. It is the task of the group to find out this.

Rules for the Group

1. No one is to leave her/his seat.
2. No one is to pass her/his clues around or show them to anyone else.
3. All sharing of clues and ideas must be done verbally.

In processing the event, the following questions maybe asked:

1. What happened to the group?
2. Was a leader needed?
3. How was time lost in getting organized?
4. Were all members included in solving the problem?
5. Did anyone monopolize the discussion?
6. What problems arose when some people did not share their clues?
7. What could have been done to make the group work more effectively?

Clues

The robbery was discovered at 8:00 a.m. on Friday, November 12. The bank had closed at 5:00 p.m. the previous day.

Miss Margaret Ellington, a teller at the bank, discovered the robbery.

The vault of the bank had been blasted open by dynamite.

The president of the bank, Mr. Albert Greenbags, left before the robbery was discovered. He was arrested by authorities at Mexico City airport at 8:30 a.m. on Friday, November 12.

The president of the bank had been having trouble with his wife, who spent all of his money. He had frequently talked of leaving her.
The front door of the bank had been opened with a key.

The only keys to the bank were held by the janitor and the president of the bank.

Miss Ellington often borrowed the president's key to open the bank early when she had extra work to do.

A strange hippie-type person had been hanging around the bank on Thursday, November 11, watching employees and customers.

A substantial amount of dynamite had been stolen from the Acme Construction Company on Wednesday, November 10.

An Acme employee, Howard Ellington, said that a hippie had been hanging around the construction company on Wednesday afternoon.

The hippie-type character, whose name was Dirsey Flowers and who had recently dropped out of Southwest Arkansas State Teachers College, was found by police in East Birdwatch, about 10 miles from the Minnesota border.

Dirsey Flowers was carrying $500 when police apprehended him and had thrown a package into the river as the police approached.

Anastasia Wallflower of East Birdwatch, Wisconsin, said that she had bought $500 worth of genuine Indian love beads from Dirsey Flowers for resale in her boutique in downtown East Birdwatch.

When police tried to locate the janitor of the bank, Ellwood Smith, he had apparently disappeared.

Miss Ellington stated that her brother Howard, when strolling to Taylor's Diner for coffee about 11:00 p.m. on Thursday, November 11, had seen Mr. Smith running from the bank.

Mr. Smith was found by the F.B.I. in Dogwalk, Georgia, on November 12. He had arrived there via Southern Airlines Flight 414 at 5:00 p.m. on the 12th.

The airline clerk confirmed the time of Smith's arrival.
Mr. Greenbags was the only person who had the key to the vault.

There were no planes out of Dogwalk between 4:00 p.m. and 7:00 a.m.

In addition to keepng payroll records, Mr. Ellington was in charge of the dynamite supplies of the Acme Construction Company.

Mr. Greenbag's half-brother, Arthur Nodough, had always been jealous of his brother.

Nodough appeared in Chicago on Monday, November 8, waving a lot of money.

Arthur Nodough always got drunk on Friday nights.

Arthur wanted to marry Camelia Smith.

Miss Ellington said that Smith had often flirted with her.

Mr. Smith's father, a gold prospector in Alaska, had died in September.

Mr. Greenbags waited in the terminal at O'Hare Field in Chicago for 16 hours because of engine trouble on the plane he was to take to Mexico City.
MURDER MYSTERY

Directions

Leader passes out the clues, one clue to each person. The leader explains that each of the pieces of paper contains one clue to help solve the murder mystery. The group has to find out from the clues: (a) the murderer, (b) the weapon, (c) the time of the murder, (d) the place of the murder, and (e) the motive for the murder. The group may organize in any way desired. Any time someone thinks s/he knows the answers and the group agrees on the guess, s/he may tell the leader. The leader checks whether all five answers are right. If part of the answers is incorrect, the leader will not tell which answers are wrong. It is the task of the group to find out.

Rules for the Group

1. No one is to leave her/his seat.
2. No one is to pass her/his clues around or show them to anyone else.
3. All sharing of clues and ideas must be done verbally.

In processing the event, the following questions may be asked:

1. What happened in the group?
2. Was a leader needed?
3. How was time lost in getting organized?
4. Were all members included in solving the problem?
5. Did anyone monopolize the discussion?
6. What problems arose when some people did not share their clues?
7. What could have been done to make the group work more effectively?

Clues

When the elevator man saw Mr. Kelley, Mr. Kelley was bleeding slightly, but did not seem too badly hurt.

The elevator man saw Mr. Kelley go to Mr. Scott's room at 12:25 a.m.

Mr. Kelley had been dead for one hour when his body was found, according to a medical expert working with the police.

The elevator man said that Miss Smith was in the lobby of the apartment building when he went off duty.

Miss Smith saw Mr. Kelley go to Mr. Jones' apartment building at 11:55 p.m.
Mr. Kelley's wife disappeared after the murder.

Police were unable to locate Mr. Scott after the murder.

When police tried to locate Mr. Jones after the murder, they discovered that he had disappeared.

Miss Smith often followed Mr. Kelley.

Mr. Jones told Mr. Kelley that he was going to kill him.

Miss Smith said that nobody left the apartment building between 12:25 a.m. and 12:45 a.m.

Mr. Kelley's blood stains were found in Mr. Scott's car.

Mr. Kelley's blood stains were found on the carpet in the hall outside Mr. Jones' apartment.

A knife with Mr. Kelley's blood on it was found in Miss Smith's yard.

The knife found in Miss Smith's yard had Mr. Scott's fingerprints on it.

Mr. Kelley had destroyed Mr. Jones' business by stealing all his customers.

The elevator man saw Mr. Kelley's wife go up to Mr. Scott's apartment at 11:30 p.m.

The elevator operator said that Mr. Kelley's wife frequently left the building with Mr. Scott.

Mr. Kelley's body was found in the park.

Mr. Kelley's body was found at 1:30 a.m.

The elevator man went off duty at 12:30 a.m.

It was obvious from the condition of Mr. Kelley's body that it had been dragged a long distance.
When he was discovered dead, Mr. Kelley had a bullet hole in his thigh and a knife wound in his back.

Mr. Jones shot an intruder in his apartment building at 12:00 midnight.

The elevator operator reported to police that he saw Mr. Kelley at 12:15 a.m.

The bullet taken from Mr. Kelley's thigh matched the gun owned by Mr. Jones.

Only one bullet had been fired from Mr. Jones' gun.
DECISION-MAKING FISH BOWL

Rationale

This is an exercise in group decision-making. We often have difficulty coming to consensus in groups. Some people do not like to compromise and feel that their judgment is always best. Others change their minds rapidly and can never seem to decide among the alternatives. They are easily swayed by others.

The purpose of this exercise is to help you become aware of how you make decisions in a group setting.

Instructions

1. Your group is to divide into two groups, A and B. The groups should be of equal size.

2. Group A is to reach consensus on Activity 1, Lost on the Moon, while group B observes the process. Consensus means that the prediction for each of the 15 survival items must be agreed upon by each group member before it becomes part of the group decision.

3. At the end of 10 minutes, group B is to stop A's activity, and share with them for five minutes their perceptions of the group's and individual's behavior in the decision-making process.

4. Then the groups are to reverse roles.

5. Repeat steps 1 through 4 until both groups have reached consensus.

6. Check your answers against NASA's answers.

Criteria for Observing the Decision-Making Process

1. Consensus is difficult to reach. Therefore, not every ranking meets with everyone's complete approval. However, does the group try to make each ranking one with which all group members can at least partially agree?

2. Do individual group members avoid emotional involvement and arguing for their own judgments? Do they approach the task on the basis of logic rather than defending their own choices based on conceivable slim evidence?

3. Do some group members avoid conflict by giving in or changing their minds?

4. Do some group members support decisions which they do not really agree with?

5. Does the group use "conflict-reducing" techniques such as majority vote, averaging, or trading to reach decisions?

6. Do the group members view differences of opinion as helpful rather than as a hindrance in decision-making?
Classroom Development

Break into groups of 12 to 16 members. Read instructions. Each group should have no more than eight members, either making the decision or observing. Provide each member with a copy of "Lost on the Moon."

Length of exercise: 60 minutes.

Assessment

What did you learn about the way you make decisions?

What did you learn about the way groups make decisions?

What can you do to improve your decision-making ability?
LOST ON THE MOON

Instructions

You are in a space crew originally scheduled to rendezvous with a mother ship on the lighted surface of the moon. Due to mechanical difficulties, however, your ship was forced to land at a spot 200 miles from the rendezvous point. During reentry and landing, much of the equipment aboard was damaged, and since survival depends on reaching the mother ship, the most critical items available must be chosen for the 200-mile trip. Below are listed the 15 items left available and undamaged after landing. Your task is to rank order them in terms of their importance in allowing your crew to reach the rendezvous point. Place the number 1 by the most important item, the number 2 by the second most important, and so on through number 15, the least important.

___ Box of matches
___ Food concentrated
___ 50 feet of nylon rope
___ Parachute silk
___ Portable heating unit
___ Two .45 calibre pistols
___ One case dehydrated milk
___ Two 100 lb. tanks of oxygen
___ Stellar map (of the moon's constellation)
___ Life raft
___ Magnetic compass
___ 5 gallons of water
___ Signal flares
___ First aid kit containing injection needles
___ Solar-powered FM receiver-transmitter

523
<table>
<thead>
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<th>1</th>
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<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
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<td>Two .45 calibre pistols</td>
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<td>One case dehydrated milk</td>
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<td>Two 100 lb. tanks of oxygen</td>
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<tr>
<td>Stellar map (of moon/constellation)</td>
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<td>Life raft</td>
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<td>Magnetic compass</td>
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<td>5 gallons of water</td>
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<td>Signal flares</td>
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<td>First aid kit containing injection needles</td>
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<tr>
<td>Receiver-transmitter solar-powered FM</td>
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**Score**

**Group Members' Names**

1. ___________________
2. ___________________
3. ___________________
4. ___________________
5. ___________________
6. ___________________
7. ___________________
8. ___________________
Decision-Making Guidelines

1. Does the group try to make each ranking one with which all group members can at least partially agree?

2. Do individual group members avoid emotional involvement and arguing for their own judgment?

3. Do some group members base their reasons on logic rather than defending their choices based on their own emotions or a small amount of evidence?

4. Do some group members support decisions with which they do not really agree?

5. Does the group reduce conflict by using majority voting, averaging, or trading to reach decisions?

6. Do the group members consider differences of opinions as helpful rather than as a hindrance in decision-making?

Learning Opportunities:

When each group has selected its choices have the leaders report on the following:

A. Could they get consensus from their group?
   1. If so how did they get it?
   2. If not what were some of the difficulties?

B. Did each group member have an opportunity to state the reasons for his/her opinions?
   1. How did the other members of the group react?
   2. Did this help or hinder the decision-making?

C. Were members of your group willing to concede on some of their opinions? Did members of the group stick to their opinion just to win the argument?

D. What are some of the problems of group decision-making? What are some of the benefits? How can we make group decision-making more effective?
MIXED-UP SENTENCES

Read the sentences carefully. Cross out the sentences which do not make sense.

1. Jane tore her new dress so her mother took it to the dentist.

2. Matthew, who is seven, had his fifth birthday last year.

3. Margaret and Jim will go to Europe this summer.

4. In 1902 some scientists dug up the remains of a car which they were sure had been a Mustang.

5. Mrs. North burned her cake so she put it back into the mixing bowl so she could try again.

6. Mother liked to shop on Fridays because there were fewer people in the store.

7. Allison knocked the vase down and broke it, so she filled it up with water again so no one would know.

8. Billy went to the market for the lady next door so she gave him fifty cents.

9. Sue liked her new bike so she slid down the hill on it.

10. Mary liked to read so she checked some books out of the library.
Hospital Plan

Indicate in what way the following plan is faulty: A particular hospital wants to rotate its employees so that each one will have a turn on night duty. Mary Jo is told that each Thursday she is to change shifts, but she will continue to have Sunday off. She is to change from the day shift (8:00 a.m. to 4:00 p.m.) to the evening shift (4:00 p.m. to midnight). The following week she is to work the early morning shift (midnight to 8:00 a.m.).

Three Posers

Play detective and see if you can solve this puzzle: A man who was served a cup of coffee in a restaurant called the waiter back to the table. Pointing to the cup, he said, "There seems to be a fly in my coffee. Please take this cup away and bring me a fresh cup of coffee."
The waiter promptly apologized, picked up the cup of coffee and took it away. He returned with a cup of coffee that had no fly in it. But when the customer tasted the coffee, he declared, "This is the same cup of coffee I had before!" How did he know?

** ** ** **

A medieval magician, carrying a bottle of liquid, approached the throne of his king.
"Sire," the magician said to the monarch, "I have here a most magic liquid. Such is its power that it will dissolve anything it touches."
"Anything?" asked the king.
"Anything!" replied the magician.
But the king knew that the magician was mistaken. How did he know?

** ** ** **

A cannon ball is dropped from the top of a tower 250 feet high. At the same instant, another cannon ball of the same size and weight is fired horizontally (straight out) from a cannon.
Which cannon ball will reach the ground first?

Clean and Dirty

Two white workmen were repairing a roof. They fell through a large chimney and landed in a fireplace on the floor below.
Both men arose unhurt. They looked at each other, walked around the room, stretched their arms and realized that they had sustained no injuries. Without speaking a word or discussing their sudden fall, both men started back to the job.
Now it happened that one man's face was well smeared with soot from his passage through the chimney. The other man's face, however, was absolutely clean. Yet the man with the clean face washed his face; the man with the dirty face went back to work without washing his face!
Can you explain, logically, why they did this?
SECRET MESSAGE

There's a secret message on the pieces of paper on these two pages. Cut out the pieces, fit them together, and you will learn what that message is.

The shape formed when all the pieces are put together will be like this:
CREATIVE WRITING ACTIVITIES

To make a comparison, two things must be compared. For instance, if you say, "The sea is shiny," that is not a comparison because "shiny" is not a thing. However, if you say, "The sea shines like a mirror" you have compared a mirror to the sea.

In this exercise use comparisons to describe ZERO.

What things in a hardware store look like zero?
TRY

Concrete Poetry

Directions

1. Choose an old adage, proverb, or well-known saying.

2. Try to make the meaning of the saying into a shape that reflects its meaning.

3. The use of line and structure is important: If your saying concerns confusion, make the shape look confusing!
COMPARISONS

Which Weighs More?

A SCREAM?  A BAG OF POTATOES?

Why?

Which is Faster?

A TABLE  A CHAIR

Why?
TAKE YOUR ORDER

How strongly do you feel about:

1. A company that continues to pollute the environment after being fined?
2. Sports being the way to encourage good sportsmanship and fairness?
3. The person who wears unusual clothes?
4. Having a dress code at school?
5. A person who cheats on his/her income tax?
6. Eating lunch in the school cafeteria?
7. A person in a restaurant who blows cigarette smoke in your face while you are eating?
8. The person who copies someone else's paper?
9. A person who uses "fear" and lectures to influence the behavior of other people?
10. Watching television more than three hours a day?
11. Selecting your own dinner when you eat out?
12. The person who always talks about ecology and throws trash out of the car?
13. The young person who uses dangerous drugs?
14. The person who is most qualified for an office actually winning the election?
15. The rationing of gasoline?
16. The person who uses too much alcohol?

Rank these on your opinion checklist (next page) by putting one item in each square. Meet with your group and agree upon the top four items. Discuss why these items are the top four.
Group Members' Names:

<table>
<thead>
<tr>
<th>Couldn't Care Less</th>
<th>Mild Opinion</th>
<th>Strong Opinion</th>
<th>Very Strong Opinion</th>
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</thead>
<tbody>
<tr>
<td>13</td>
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<td>10</td>
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<td>15</td>
<td>11</td>
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<td>3</td>
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<td>16</td>
<td>12</td>
<td>8</td>
<td>4</td>
</tr>
</tbody>
</table>

EMI-1
(Cont.)
Think about yourself in three parts. Think of facts, actions, and feelings. Make a word collage to tell about yourself.

**FACTS:** (Name, address, hair color, eyes, height, weight, phone number, shoe size, etc.)

**FEELINGS:** (Ways I feel: sad, happy, bored, etc.)

**ACTIONS:** (Things I do: school, read, baseball, music, dance, chores, tennis, eat, etc.)
ABOUT ME!!

Read the sentences and circle Yes or No or Sometimes.

1. I like people.                             Yes    No    Sometimes
2. I like to be on time.                      Yes    No    Sometimes
3. I like to play ball.                      Yes    No    Sometimes
4. I am honest.                               Yes    No    Sometimes
5. I want to be a leader.                    Yes    No    Sometimes
6. I believe in playing fairly.               Yes    No    Sometimes
7. I like to go to school.                   Yes    No    Sometimes
8. I like to work alone.                     Yes    No    Sometimes
9. People like me.                           Yes    No    Sometimes
10. I am moody.                               Yes    No    Sometimes
11. I usually finish work on time.           Yes    No    Sometimes
12. I have a hobby.                          Yes    No    Sometimes
13. I get mad.                               Yes    No    Sometimes
14. I help with jobs at home.                Yes    No    Sometimes
15. I like to do jobs at school.             Yes    No    Sometimes
16. I help others.                           Yes    No    Sometimes
A NEW ISLAND!!

A new island has been formed in the middle of the Pacific Ocean. You have been named governor of the new island. You must select two people to help you organize the new land. You must:

1. Name it.
2. Tell what jobs are necessary in order for people to live there.
3. Decide where the cities will be.
4. Decide how the citizens will earn a living.

The decision is yours. There are no right or wrong answers. Write your ideas on paper. Draw a map of the island. Show the name of the island, its location, and the names of at least two cities.
BEST FRIEND

Write a description of your best friend and tell why you like him/her.
# Checklist for the Creative Person

After each item put the words "Have" or "Have not" for each week.

<table>
<thead>
<tr>
<th>Elements of Creativity</th>
<th>First Week</th>
<th>Second Week</th>
<th>Third Week</th>
<th>Fourth Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Desire</strong> - wanting to make things better, hoping to improve what is already good.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. <strong>Alertness</strong> - being alive, awake to notice everything that happens to you and around you.</td>
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<tr>
<td>3. <strong>Interest</strong> - wanting to dig beneath the surface of what goes on.</td>
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<td></td>
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<tr>
<td>4. <strong>Curiosity</strong> - thinking of and asking questions on all sections of a problem or situation.</td>
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<tr>
<td>5. <strong>Thoughtfulness</strong> - seeing all the parts of a problem and giving considerate thought to understanding exactly what it is.</td>
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<tr>
<td>6. <strong>Concentration</strong> - being able to focus your interest and thought and keep it focused so that you can think about and understand things in depth.</td>
<td></td>
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<tr>
<td>7. <strong>Application</strong> - putting forth the effort, using energy and hard work constantly.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. <strong>Patience</strong> - being able to keep coming back to a problem time after time, until you're completely satisfied with the solution.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>10. <strong>Cooperation</strong> - being willing to share your ideas with others and to help develop them. Considering the reactions of others and their suggestions.</td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
WHAT WOULD YOU THINK?

What would you think if you found a turtle in your bathtub? Write a story about it. Draw a picture.

A MIXED-UP WORLD

What would happen if every flower in the world were yellow? Write a story about it.

A MIXED-UP WORLD

What could happen if carrots tasted like candy? Write a story about this. Draw a picture.

A MIXED-UP WORLD

What could happen if all the shoes in the world were the same size? Write a story and draw a picture.

A MIXED-UP WORLD

What could happen if cows have manes like lions do? Write a story and draw a picture.

WHAT WOULD YOU THINK?

What would you think if all the lights went out every time you turned on the water? Write a story about what happened. Draw a picture.
EFR-1 MEASUREMENT (SIMPLE)

1. A
2. E
3. B
4. D
5. B and D
6. C and E

EFR-1 MEASUREMENT (COMPLEX)

1. A
2. C and D or B and E
3. Yes
4. Yes
5. No
6. No
7. No
8. H
9. B
10. A, B

ESU-5 FIND THE LETTERS

X L U V M X L P M V
U V M L X P U M X L
M X U V X M L P V
X L M U V X P X L
U V M U V M X L P
V X L V M X L P U X
M V X U V M P X L
X L M D U M X L P
L U V X X L X V U M
P L U V M X L P L P
ESU-7  SAME OR DIFFERENT? (SIMPLE)


ESU-8  SAME OR DIFFERENT (COMPLEX)

2. D  7. S  12. D
5. S  10. D  15. D

ESU-9  FIND THE WORDS

1. session, histone
2. pastor, roost, cloth
3. city, mood, tidy (Not idiom since given word does not have two i's.)
4. clean, enamel, hence
5. start, unto, aunt
6. push, rebus

ESC-1  VOWEL-CONSONANT ARRANGEMENT

<table>
<thead>
<tr>
<th>Double Vowel</th>
<th>V-C-V</th>
<th>C-V-C</th>
<th>Double Consonant</th>
</tr>
</thead>
<tbody>
<tr>
<td>soon</td>
<td>gasoline</td>
<td>pilot</td>
<td>happen</td>
</tr>
<tr>
<td>pioneer</td>
<td>apart</td>
<td>person</td>
<td>collect</td>
</tr>
<tr>
<td>free</td>
<td>care</td>
<td>force</td>
<td>different</td>
</tr>
<tr>
<td>certain</td>
<td>pretend</td>
<td>king</td>
<td></td>
</tr>
<tr>
<td>learn</td>
<td>honest</td>
<td>silence</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>purple</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>joke</td>
<td></td>
</tr>
</tbody>
</table>
### Multiples of 2

| 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100 |

### Multiples of 3

| 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60, 63, 66, 69, 72, 75, 78, 81, 84, 87, 90, 93, 96, 99 |

### Multiples of 4

| 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76, 80, 84, 88, 92, 96, 100 |

### Multiples of 3 and 6

| 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72, 78, 84, 90, 96 |

### Multiples of 5 and 10

| 10, 20, 30, 40, 50, 60, 70, 80, 90, 100 |

### Primes

| 1, 3, 7, 11, 13, 17, 19, 23, 31, 37, 41, 43, 47, 49, 53, 59, 61, 67, 73, 79, 83, 89, 91, 97 |

---

**ESC-3 CROSS OUT WORDS.**

1. cloth  
4. some  
7. loot  
10. store

2. bland  
5. cable  
8. knock  
11. quiet

3. lose  
6. hallow  
9. kink  
12. tomb

---

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ESC-4. A WORD PUZZLE

1. bake  
4. take  
7. capture  
10. literature  
2. quake  
5. flake  
8. mixture  
11. signature  
3. stake  
6. mistake  
9. immature  
12. posture

ESR-1 WORD PAIRS

A. 3  
F. 2  
B. 3  
G. 1  
C. 1  
H. 3  
D. 2  
I. 3  
E. 3  
J. 1

ESR-2 FAMILY PICNIC

1. 3  
2. 3  
3. 3  
4. hot dogs

ESR-3 LETTER RELATIONSHIPS

A. 3  
E. 3  
B. 1  
F. 3  
C. 3  
G. 1  
D. 3  
H. 1

ESR-5 GEOMETRIC FIGURES

1. True  
2. True  
3. False  
4. False  
5. False  
6. False  
7. False  
8. True  
9. True  
10. False  
11. False  
12. False  
13. False  
14. True  
15. True  
16. False
ESS-1 WHICH ONE?

1. A. T  
   B. F  
   C. F

2. A. F  
   B. F  
   C. T

ESS-2 WHICH ONE DOESN'T BELONG?

1. 9
2. 2
3. 3
4. 25
5. 34
6. 47
7. 16
8. 62
9. 18
10. 6

EST-1 WORDS FROM WORDS

1. a. Yes  
   b. No  
   c. Yes  
   d. No

2. a. Yes  
   b. Yes  
   c. No  
   d. No

3. a. No  
   b. Yes  
   c. Yes  
   d. No

4. a. Yes  
   b. Yes  
   c. No  
   d. No

5. a. Yes  
   b. No  
   c. No  
   d. No

6. a. No  
   b. Yes  
   c. Yes  
   d. No

7. a. Yes  
   b. No  
   c. Yes  
   d. Yes

8. a. No  
   b. Yes  
   c. Yes  
   d. No

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EST-2  WHAT'S IN ASTRONAUT?

route, starve, short, trouble, undo

ESI-1. WORDS FOR ABBREVIATIONS

1. adj. adjective
2. adv. adverb
3. def. definition
4. Fr. France
5. Ger. Germany
6. geog. geography
7. govt. government
8. pl. plural
9. U.S. United States
10. Inc. Incorporated
11. Corp. Corporation
12. Mr. Mister
13. Mrs. Mistress
14. Dr. Doctor or Drive
15. st. street
16. Prof. Professor
17. etc. et cetera
18. blvd. boulevard
19. ave. avenue
20. R.S.V.P. répondez s'il vous plaît
21. N. north
22. E. east
23. W. west
24. S. south
25. Calif. California
26. S.D. San Diego
27. Wash. D.C. Washington, District of Columbia
28. R.R. Rural route or railroad

ESL-3  SHORTENED SPELLINGS

1. Boulder
2. Chevalier
3. Defame
4. Encourage
5. Hyonettees
6. Language
7. Odorous
8. Receipt
9. Bamboo
10. Consider

EMU   CHOICES AND DESCRIPTIONS

A. Bo: of tissue
B. A ball
C. A frog
D. Vegetable brush
E. Ice cream cone
F. Nerf ball
G. Glass
H. Bark on a tree
EMR-1  A BANK ROBBERY MYSTERY

The Ellingtons collaborated to rob the bank, Miss Ellington supplying the front door key (borrowed from Mr. Greenbags) and Howard supplying the dynamite. Greenbags had already left for Brazil when the robbery took place. Mr. Smith was in Dogwalk on the night of the robbery. Dirsey Flowers was at the home of Anastasia's parents. The Ellingtons were lying when they tried to implicate Smith. There was no evidence that Arthur Nodough was connected with the robbery in anyway.

EMR-2  MURDER MYSTERY

After receiving a superficial gunshot wound from Mr. Jones, Mr. Kelley went to Mr. Scott's apartment where he was killed by Mr. Scott with a knife at 12:30 a.m. because Mr. Scott was in love with Mr. Kelley's wife.

EMS-2  BRAIN TEASERS

Hospital Plan: This plan is faulty because the second week Mary Jo would have no opportunity to sleep since she would have to work the day shift on Friday.

Poser No. 1: The man knew it was the same cup of coffee because he had put sugar in the coffee before he found the fly in it.

Poser No. 2: The king knew the magician was mistaken, because if the liquid dissolved everything it touched, it would dissolve the bottle, too.

Poser No. 3: Both cannon balls will reach the ground at the same time. Gravity acts on each one in the same way, so each one will approach the ground at the same rate.
Clean-and Dirty: The workmen looked at each other. The first man saw that the other's face was dirty, hence he assumed that his own was dirty also. The man with the dirty face saw the clean face of his companion and supposed that his own was clean. Thus the man with the clean face washed and the man with the dirty face did not.

Answers:

Box of matches 15
Food concentrate 4
50 ft. nylon rope 6
Parachute silk 8
Portable heater unit 13
Two .45 calibre pistols 11
One case dehydrated milk 12
Two 100 lb. tanks of oxygen 1
Stellar map (moon version) 3
Life raft 9
Magnetic compasses 14
Five gallons of water 2
Signal flares 10
First-aid kit with needles 7
Solar-powered radio 5

Answers in order:

1 Two 100-lb. tanks of oxygen
2 Five gallons of water
3 Stellar map
4 Food concentrate
5 Solar-powered FM transceiver
6 Fifty feet of nylon rope
7 First-aid kit with injection needles
8 Parachute silk
9 Life raft
10 Signal flares
11 Two .45 calibre pistols
12 One case dehydrated milk
13 Portable heating unit
14 Magnetic compass
15 Boxes of matches

Scoring

Subtract your ranking number for each item from NASA's ranking number. Add these differences. Also do this for the ranking list and compare individual prediction with the group prediction.

Example:

<table>
<thead>
<tr>
<th>Item</th>
<th>Your Ranking</th>
<th>NASA's</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Box of matches</td>
<td>8</td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td>Signal flares</td>
<td>14</td>
<td>10</td>
<td>4</td>
</tr>
</tbody>
</table>

Explanation

These are the answers supplied by the NASA scientists. The answers are split into groups, physical survival and traveling to the rendezvous.

The first two items are air and water without which you cannot survive at all. After that comes the map for locating position and figuring out how to get to the rendezvous. Food comes next for strength on the trip. It is not as necessary for survival as air and water.
The FM transceiver is for keeping in touch with earth. In a vacuum, without an ionosphere, radio transmission travels only in line of sight and would be limited on the moon to destinations of approximately ten miles. On earth powerful receivers could pick up messages which would then be relayed to the mother ship. The next item would be rope for lunar mountain climbing and traversing crevasses on the trip. The next item would be first aid for injuries. Parachute silk would offer excellent protection from sunlight and heat buildup.

The life raft is a carryall for supplies (the moon's gravity permits heavy loads to be carried), as a shelter, and a possible stretcher for the injured. It also offers protection from micro-meteorite showers.

Flares cannot burn in a vacuum but they, as well as the pistols, can be shot. Flares and guns would therefore be excellent propulsive devices for flying over obstructions. The milk is heavy and relatively less valuable.

On the moon overheating is a problem and not cold. Thus the heating unit is useless.

The magnetic compass is useless without a map of the moon's fields. The box of matches is obviously the most useless item.

Evaluation Task Cards

Task cards created for use with the evaluation factor are presented on the following pages. Answers are presented at the end of the section.

The task cards have also been printed on a heavier stock and sets (Stock No. 41-S-9941) may be ordered through the Office of Materials Development, 293-8140.
DRAW A CARTOON

Draw a cartoon showing what the sentences say. Write the cliché under the cartoon.

1. Lend me your ears.
2. He yelled his head off.
3. He always puts his foot in his mouth.
4. She worked like a dog.
5. He was so surprised his eyes popped out.
6. Keep an eye on the baby.
7. It's raining cats and dogs.
8. He's more fun than a barrel of monkeys.
9. He let the cat out of the bag.
10. He's growing like a weed.
11. She's as pretty as a picture.
12. He's as busy as a bee.
13. They caught him red-handed.
14. She's stretching the truth a little.
15. He's sharp as a tack.
WORD GROUPS

Each person should number 1 to 10 on paper. The first to write all the words that belong to each group wins.

1. orange, purple, red
2. milk, eggs, flour
3. one, four, six
4. run, hop, jump
5. bed, chair, rug
6. doll, horn, ball
7. pig, cow, pony
8. baby, mother, girl
9. elephant, lion, bear
10. bus, car, train

airplane
lamp
monkey
green
boy
butter
two
skip
balloon
horse
SCRAMbled SEnTENCES.

Try to unscramble the sentences below. Then write them correctly on paper.

1. smelled the flower good blue
2. can't shoes I my tie
3. smiling astronauts four were the
4. head the shook lion his
5. rowed river man the the down
6. good eggs eat to are scrambled
7. the the around ran piano boy
8. alike twins the very look much
9. hurt man still but alive the is was
ROOT WORDS

Find the root word in each word. Write it on paper. The first one to finish the list wins.

1. boxes
2. glasses
3. goes
4. running
5. eaten
6. cooler
7. warmer
8. restless
9. witches
10. loaded
11. looked
12. jumping
13. walking
14. bushes
15. waiting
16. sunny
17. dresses
18. frogs
19. singer
20. friendly
21. crying
22. helpful
23. baker
24. needed
25. longer
26. decided
27. biggest
28. longest
29. answered
30. runs
31. ears
32. wanted
33. cutting
34. throwing
35. playing
36. baked
37. sadness
38. doll
39. laughed
40. taller
RHYMING WORDS

Write these four words on paper at the top of four columns.

then  day  sell  thing

Write the words below under the word they rhyme with.

1. hay  13. stay  26. bay
2. well  14. ten  27. tell
3. when  15. king  28. clay
4. string  16. bring  29. men
5. pen  17. shell  30. spring
6. den  18. wing
7. say  19. bell
8. fell  20. play
9. spell  21. tell
10. bay  22. clay
11. hen  23. men
12. ring  24. spring
ILLUSTRATING WORDS

Choose a word from the list below. Make a picture or a collage to illustrate the word. Use small pictures from magazines, words from newspapers and magazines, materials from the Found Box, and drawings. Put the word you choose on the back. See if others can guess the word you picked. Later a story can be made to go with the mood picture.

1. happy
2. angry
3. afraid
4. freezing
5. embarrassed
6. shy
7. sad
8. friendly
9. lazy
10. impatient
11. excited
12. sleepy
13. brave
14. warm
15. jealous
Choose a "just suppose" question. Write or draw what you think might happen.

1. What would happen if our shadows became real?
2. What do you suppose would happen if there were no night?
3. What do you suppose would happen if one morning there were no gravity?
4. What do you suppose would happen if you could become invisible?
5. What do you suppose would happen if a spaceship from another planet landed on the patio of your home?
6. What would happen if the wind never blew?
7. What would happen if the sun suddenly cooled off?
8. What do you suppose would happen if everybody stopped working?
9. What do you suppose would happen if everyone loved everyone else?
LAST ONE WINS

Here's a game for two people and 20 checkers. The checkers are on a table. The players take turns picking up the checkers. Each player must pick up 1 or 2 or 3 checkers each time. The player who picks up the last checker wins.

Here's how to win: Let the other player go first. This is polite and, pleasantly enough, it will also help you win. You must pick up:

The 4th checker
The 8th checker
The 12th checker
The 16th checker
And the 20th checker, which wins!

How does it work?

When the other player picks up 1, you pick up 3.
When s/he picks up 2, you pick up 2.
When s/he picks up 3, you pick up 1.

If the other player begins to catch on to how you are winning, change the number of checkers in the game to 30.
WHAT WOULD YOU DO IF... 

Thinking about what you would do in each of the situations below may help you discover what you want and value. Write down three actions you would take if:

- You were President of the United States.
- You were given $1,000,000.
- You could do anything you wanted for one month.
PET PEEVES

Everyone has "pet peeves." List your pet peeves. Now list all the ideas you can dream up for reducing these irritations.
In I there is no difficulty in drawing a continuous line which crosses each line segment (e.g. AB, BC, CF, etc.) once and only once. But it is impossible to draw a similar line in II. For example, the line drawn fails to cross the segment EF. Can you draw a line crossing each line segment in III?
Can you take a trip through every door of this house without passing through any door more than once?
Take a walk

Can you take a walk which will take you over each of the seven bridges and cross each bridge only once?
TAKE A FLIGHT.

On an airplane flight there are four people:

The pilot
The flight engineer
The flight attendant
The passenger

Which would you choose to be? What are your reasons for your choice?
ANSWERS

Task Card 2
1. green  2. butter  3. two  4. skip  5. lamp
6. balloon  7. horse  8. boy  9. monkey  10. airplane

Task Card 3
1. The blue flower smelled good.
2. I can't tie my shoe.
3. The four astronauts were smiling.
4. The lion shook his head.
5. The man rowed down the river.
6. Scrambled eggs are good to eat.
7. The boy ran around the piano.
8. The twins look very much alike.
9. The man was hurt but is still alive.

Task Card 4
1. box  2. glass  3. go  4. run  5. eat
6. cool  7. warm  8. rest  9. witch  10. load
11. look  12. jump  13. walk  14. bush  15. wait
21. cry  22. help  23. bake  24. need  25. long
26. decide  27. big  28. long  29. answer  30. run
31. ear  32. want  33. cut  34. throw  35. play
36. bake  37. sad  38. doll  39. laugh  40. tall

Task Card 5
Then          Day          Sell          Thing
Hen           hay           bell          king
ten           say           tell          bring
men           play          shell          wing
pen           clay          well          spring
when          bay           fell          string
den           stay          spell          ring