Harris, Carolyn DeMeyer; And Others

The project designed and developed a videodisc package that provides both assessment and related instruction programs for job-related mathematics problem solving, using simulations to provide direct access to vocational situations. The materials are intended to meet the needs of youth and young adults with mild mental handicaps in transition from school to work. The project analyzed current student performance competencies related to the use of mathematics in both generic and specific vocational situations, designed and developed interactive videodisc materials called "Working with Math," and conducted a pilot test. Students were instructed, and student performance was assessed, in the following areas: measuring length, perimeter, area, capacity, weight, temperature, and time; money values and relationships; money earned; and money-related forms. The report's five sections consist of an introduction, descriptions of the design and development, pilot test and dissemination activities, and a list of 11 references. Appendices, which make up the bulk of the document, include: (1) a list of basic and job-related mathematics skills; (2) the scripts used in the assessment portion of the videodisc program; (3) the scripts used in the instruction portion of the videodisc program; and (4) a pilot test rating sheet. (JDD)
FINAL REPORT
AN INTERACTIVE VIDEODISC PROGRAM
TO EVALUATE AND TRAIN JOB-RELATED
MATH SKILLS FOR TRANSITION
FOR
GRANT #G008730292

Submitted to:
U.S. Department of Education
Office of Special Education Programs

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November 30, 1989
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I. INTRODUCTION
I. INTRODUCTION

The current emphasis on the transition of handicapped adolescents from school to the community has generated renewed interest in the specific skills related to the transition to work. The ability to apply functional mathematics is at the heart of many jobs, including those skills related to specific job performance and to personal needs associated with work. For example, it is important for employees to record hours worked, to comprehend how paychecks are computed, and to understand other specific math-related skills such as working with money and making change, understanding time and scheduling appointments, and measurement of all types. However, it also is true that the assessment of these functional math competencies in individuals with handicapping conditions has been extremely difficult due to the inability to distinguish between an individual’s skill in real life situations and his or her ability to function in abstract or unrelated academic assessment situations.

Macro Systems, Inc. was awarded a grant under the Office of Special Education Programs priority, Improving Technology Software. In its proposal, Macro noted that current state of the art videodisc technology offered the potential for simulation experiences that allow both a much more concrete assessment of an individual’s ability to cope with real life math situations and instructional activities that provide opportunities for remediation related directly to assessment results.

In attempting to assess the interests and abilities of students with handicaps as they move from school to work, the ability to integrate basic academic skills into this assessment is crucial to the success of the task. The literature shows that academic assessment instruments to measure math skills are typically included when a vocational assessment test battery is administered (Brolin & Kokaska, 1985). Almost all of these instruments use the typical paper and pencil technique, such as the Wide Range Achievement Test (Jastak & Jastak), the KeyMath Diagnostic Arithmetic Test (Connolly, Nachman, & Pritchett), and the RRC Diagnostic Inventory (Regional Resource Center, University of Oregon). To date, there exists no standardized assessment instrument that provides an advanced application of simulation as the basis for assessing math skills. In fact, only a few instruments, such as the Detroit Test of Learning Aptitude (1984), the K-ABC Assist (1983), and CompuScore (1984), are even providing software to assist in scoring.
While there is increased interest in computerizing existing paper and pencil assessment instruments, a major problem exists -- the need to assess handicapped students' math skills in real life situations, particularly vocational settings. The history of special education literature is replete with references and studies indicating the difficulty that handicapped youth, particularly those with cognitive impairments, have in moving from the concrete to the abstract level of functioning and between dissimilar concrete level tasks (Mercer, 1982). In light of these difficulties, it is important that the assessment of job-related math skills be completed in settings as close as possible to the conditions under which the skills will be applied. While this leads to the logical conclusion that these skills should be assessed in the actual work place (i.e., situational assessment), there are a variety of reasons why this is not usually done, such as transportation problems, site or business restrictions, availability of sufficient support staff, and, in some cases, the level of appropriate behavior of the student or client.

In addition to the use of videodisc technology for assessment, the need for remedial instruction related to the same areas is evident. The focus of school-based vocational evaluation has been to assess both the current level of functioning and the ability to learn new and varied tasks.

The development of interactive videodisc programs to support evaluation and training needs has been growing rapidly in industry, the military, and other non-school applications (Ofiesh, 1987). Education has lagged far behind other areas of the training world, even when presented with evidence that this technology is effective and improves performance. Listening to comments from the industry, interactive videodisc sounds like the latest snake oil, the cure to end all training ills. Statements like "Training effectiveness is increased by 75 percent with interactive video, compared to 40 percent with videotape, and 15 percent with seminars and print materials"; or "We will guarantee that 90 percent of your people will perform better after training with interactive video," appear frequently in trade publications (Market Monitor, 1985). One expects such hyperbole from those who have products and services in the marketplace. However, when nearly identical claims are voiced by academic researchers — "We are consistently going into difficult instructional settings and adding about 20 percent to levels of mastery" (SchoolTechNews, 1986); "...groups averaged a 72.5 percent learning gain" (Carter, Browning, Nave, & White, 1985); "...offers...excellent learner productivity" (Gindele & Gindele, 1984) — one begins to consider them more seriously.
In the assessment of instruction for students with learning handicaps, it appears interactive video has much to offer (Becker & Schur, 1986). As a time and cost saving tool in the development of individualized education plans (IEP), one study found that computer assessment takes just two-thirds the time of print assessment. Another study reported that, after development costs were met, the traditional paper-based assessment cost 3.9 times more than the computer assessment (Becker & Schur, 1986).

Using interactive videodisc for presentation of real life simulations enhances the program's potential for assessing, instructing, and providing practice in appropriate job-related mathematics. With the computer carrying out the scoring, bias is avoided and error rate in computation is eliminated. The second audio track of the videodisc provides a particular advantage by reducing reading requirements for poor readers (Schuerholz, 1985), thus increasing the focus on mathematics skills. Use of attractive color graphics in conjunction with text and video help focus and hold attention (Techsplanations, 1989), and the touch screen interface further enhances user involvement and interaction during the program. This active participation breathes life into abstract concepts and allows a student to take part in the vignette; the lesson is more readily understood because it is "real" (Widerquist, Birdsell, Johnson, Crowell, & Miller, 1987). In addition, the student determines the pacing of the lesson. This control has been found to be critical for the instruction of students with learning problems, guarding their often shaky self-esteem and confidence (Gindele & Gindele, 1987). These affective factors have been found to influence the amount of time students stay on-task and the time period one will stay on any particular lesson. Exciting and intriguing, students enjoy the use of videodisc (SchoolTechNews, 1986).

There is every reason to believe that advances being made in the technologies comprising interactive videodisc will continue to expand the potential uses for such a widely applicable tool. Just as we have seen tremendous increases during the past five years in uses of microcomputer and videotape equipment and their related programs in schools, videodisc systems are beginning to grow in use for a broad range of training activities, including some limited use in special education. Following the lead of their industrial and military counterparts in using videodisc technology, as the cost of equipment continues to decrease, schools will be looking for well-designed and flexible courseware to get their systems up and running. Toward this end, the Office of Special Education Programs grant priority, "Improving Technology Software," supported this project, whose specific objectives included:
• To design and develop a videodisc package that provides both assessment and related instruction programs that make use of simulations to provide direct access to a series of vocational situations that focus on student abilities to problem solve and determine the correct answers to a number of job-related problems.

• To pursue commercial publication of the package to promote availability to the largest number of youth and young adults with handicaps.
II. DESIGN AND DEVELOPMENT OF MATERIALS
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The first year of the grant consisted of the analysis of current student performance competencies related to the use of mathematics in both generic and specific vocational situations, and the design and development of the assessment component of the interactive videodisc math program. The second year consisted of the design and development of the related instructional component of the interactive videodisc program, pilot testing, and the development of final documentation for use of the complete package entitled Working with Math.

Analysis

The project staff surveyed selected existing curricula and literature related to vocational competencies to identify math-related competencies including the following:

- **Access Skills: Vocational Readiness Skills Inventory for Special Needs Students** (Missouri LINC, 1987)
- **Computerized Vocational Objectives Manual and Data Bank for Students with Special Needs** (Missouri LINC, 1984)
- **Academic Competency Taught in Vocational Education (ACTIVE) Report** (Jean Sillers and Barbara Rupp for the state of Michigan, 1985)
- **Master Taxonomy List** (Les Snyder for the Vocational Technical Education Consortium of States, 1987)
- **Basic Competencies in Mathematics** (SREB-State Vocational Education Consortium, 1987)
- **Secondary School Mathematics for the Learning Disabled** (John F. Cawley, 1985)
- **Developmental Teaching of Mathematics for the Learning Disabled** (John F. Cawley, 1984)
- **Improving the Basic Skills and Job Awareness of Handicapped Students** (Final Report of the Ohio State University National Center for Research in Vocational Education for the Office of Special Education and Rehabilitative Services, 1985)

The greatest source of information came from the preliminary research for the Ohio State report. The purpose of that project was to develop and test 30 instructional booklets in arithmetic skills for the specific occupations that were considered appropriate for
mainstreamed mentally retarded, learning disabled, and emotionally disturbed students. With few exceptions, the work-related mathematics skills found in the reviewed materials were also mentioned in the Ohio State work. In addition, the defined population for that project matched this project's target population. The decision was made to use the Ohio State list as the primary source in compiling our list of job-related math skills so the frequency with which various skills were required across all suitable occupation could be compared in a consistent manner. The list was then checked against the other sources of information to ensure completeness.

The review, particularly definitions of what constitutes basic mathematical skills and recommendations made by the National Council of Supervisors of Mathematics and the National Council of Teachers of Mathematics, also lead to a decision that computational skills apply across math competencies and are more appropriately assessed within the context of the identified competencies. Further, all identified skills fell within two major competency areas — measurement and money. With the identification of only two competency areas, it became advisable to design the survey instrument listing all component skills, and to ask reviewers to identify those skills most important to include in an assessment program. The final list contained 98 fundamental skills and application tasks.

The 12 reviewers, solicited from the membership of the Vocational Education and Work Adjustment Association (VEWAA) or the American Vocational Association (AVA), were knowledgeable in vocational rehabilitation mathematics assessment for special populations. [A list of reviewers is presented in Appendix A.] The survey instrument was mailed to the reviewers who rated the importance of the identified competencies for transition to work for youth who are handicapped. In addition, the reviewers were asked to comment on several issues such as: the number of digits for computational problems, the smallest fractional unit to include, the extent of coverage of decimals other than money, the metric system and Celsius temperature, an appropriate standard for passing the assessment, and inclusion of an on-screen calculator. [The materials sent to reviewers are contained in Appendix B.]

The following rules were applied to the returned surveys to aid in decisions about those skills that would be covered in the videodisc assessment and subsequent instructional program:
0 - 3 Yes responses  
not considered for inclusion

4 - 8 Yes responses  
considered for inclusion, but must meet the following criteria:
-- be directly and inseparably related to a skill that received a high rating, and was eventually included in the program; and
-- be a skill which, in the project staff's opinion, is essential to success in the jobs in which the target population is most likely to be placed.

9 - 12 Yes responses  
seriously considered for inclusion, but must meet the following criteria:
-- be a skill which, in the project staff's opinion, can be effectively dealt with in the medium of interactive videodisc;
-- be a skill that is not so fundamental that we must assume that any student taking the assessment already possesses this skill; and
-- be a skill which, in the project staff's opinion, is essential to success in the jobs in which the target population is most likely to be placed.

Fifteen skills and tasks were eliminated as a result of low ratings; 51 fell in the middle group; and 32 received high ratings. Approximately 50 target skills remained after careful review of the 51 middle group skills and 32 serious considerations. The two math competency areas -- measurement and money -- were specified in the following nine skills:

- Measuring Length
- Measuring Perimeter and Area
- Measuring Capacity
- Measuring Weight
- Measuring Temperature
- Measuring Time
- Money Values and Relationships
- Money Earned
- Money-Related Forms

After a review of the hardware it was decided that a single monitor and touch screen offered the most direct presentation and user interface for the target population. In addition, there was need for a computer with sufficient capacity to handle the large assessment and instructional programs that were anticipated. Further investigation indicated that at the secondary school level there was a growing trend toward use of IBM and compatible computers. Thus, the IBM-PC or compatible was seen as the best choice to
meet the needs of this project. IBM Corporation generously loaned Macro a complete InfoWindow system including XT personal computer and Pioneer LaserDisc player. The TenCORE Authoring Language was selected as the most powerful and flexible software for programming the lessons.

Design

The overall objective of this project was twofold:

To present problems to the student in as realistic manner as possible through the medium of interactive videodisc, thus allowing them to use both their school math skills and their everyday cognition; and

To limit the assessment and related instruction to mathematical problems that are truly essential to the performance of those jobs in which the target population would realistically be placed.

Using a team approach, each project staff member assumed primary responsibility for two or three of the target skills, designated as lessons for design purposes. Each skill was analyzed for further divisions or segments in the design specifications. No further subdivisions were necessary. The design specifications for the assessment and instructional topics within the two competency areas included the following:

<table>
<thead>
<tr>
<th>Lesson Title</th>
<th>Lesson Objective</th>
<th>Segment Subject (when this level of specificity was applicable)</th>
<th>Segment Objective (when this level of specificity was applicable)</th>
<th>Standard</th>
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</tbody>
</table>

For the assessment component, the list of likely jobs for the target population in the Ohio State research was used to identify four or five jobs in which all of the identified mathematical skills could be reasonably depicted in the simulations. Based on the subcontract with Video Software Associates, which provided five days of location shooting with nine actors, and securing four appropriate work sites, the following jobs, main characters, and gender and racial characteristics were established:
The instructional component used a single character, Mr. Barwood, a small restaurant owner, as a friendly, helpful "teacher." He was established as a boss who had helped many young workers figure out ways to accomplish the math needed in their jobs. In addition to the obvious skills related to weight, capacity, temperature, time, and money, since it was a small restaurant, it seemed plausible that the target skills of length and perimeter and area could be incorporated through a redecorating project and small repairs.

Based on the design specifications and character descriptions, scripts were written and then reviewed by each other team member and the production director for accuracy, clarity, realism, feasibility, and user interface until final shooting scripts were achieved. [Assessment Working Scripts are contained in Appendix C and Instructional Working Scripts are contained in Appendix D, each of which is bound separately.]

Development

The project staff used the shooting scripts to work with Video Software Associates during filming of Working with Math. The following four sites generously agreed to the assessment production with filming occurring over five days in April 1988:

Gallery Lafayette, an art and frame shop
Miller and Smith Homes, a newly constructed house
Trinity United Methodist Church, an industrial kitchen
U.S. Department of Agriculture, a warehouse

For the instructional production in May 1989, Trinity United Methodist Church agreed to three days of filming for a location fee. Giant Food, Inc., Maryland National Bank, and Long Fence Company provided some of the props for the assessment production.

Each production was followed by editing to a rough cut, which was reviewed by project staff and personnel from the Maryland Rehabilitation Center, narration and feedback recording, and final edit with Paint Box graphics to master tape. Videodisc mastering was
done by 3M Corporation. The assessment videodisc is single-sided with approximately 29.5 minutes of motion and stills and 27 minutes of second audio. The instructional videodisc is double-sided and contains approximately 8 minutes of motion and stills and 45 minutes of second audio per side.

The instructional videodisc was planned and budgeted as a single-sided disc; however, the audio required to meet the needs of the target population necessitated the use of both sides. It was decided that all nine lessons should be filmed in order to provide for a complete package, and Video Software Associates agreed to produce two master tapes through a reduction in motion and still for a substantial increase in second audio. However, the budget could accommodate programming for a single side only. The second side will be programmed when an agreement is reached with a commercial publisher.

The assessment component was designed as a closed structure with the order of tests predetermined and completion of a test required for scoring to be recorded. The first time a student enters the program, he or she is forced to see the introduction, which provides an overview of the program and how to work with the InfoWindow system. There is no formal feedback, and the student cannot back up or jump forward. All questions except multiple choice allow the student to change an answer until it is exactly what is desired. When an answer is entered, however, the program automatically branches to the next problem. Questions that are used to build subsequent problems ask students to confirm their answer before branching, but an incorrect response to one part of a series does not affect whether the student can obtain a correct response on another part. Help, consisting of how to use the program, how to answer the particular type of question on the screen, glossary, and summary of the lesson or test focus, is available whenever a question is on the screen.

The instructional component was designed as an open structure with the student having control over the sequence of lessons through use of a main lesson menu. The touch boxes beside each lesson title are designed with a color coding system to help the instructor and student monitor progress in the program. When first starting the instructional program, all boxes are colored blue. If the instructional portion of a lesson is completed, the box changes to yellow indicating that the student has tried the lesson but has not completed the quiz. After the lesson quiz is completed, the box changes to green or red depending on whether or not it was passed at 75 percent accuracy.
The student also controls much of the movement within a lesson through the use of menus. A lesson must be completed for scoring to be recorded. As in the assessment component, the student is forced to see the introduction the first time he or she enters the program. Each lesson progresses from simpler to more complex subskills through presentation of an instructional segment followed by examples and then practice problems. Every student response receives voiced feedback with overlay text in one of the following forms:

One of four correct answer messages on any attempt.
One of four unanticipated incorrect answer messages with a prompt to try again if it is the first attempt and without if it is the second attempt.
One to four anticipated incorrect answer messages if it is the first or second attempt.
A third attempt incorrect answer message

A correct response on the first attempt results in feedback and automatic branching to the next problem or instructional segment. A correct response on the second or third attempt results in feedback and a menu display that asks the student to select either go on or quit.

An incorrect response, anticipated or unanticipated, on the student's first attempt results in feedback and automatic replay of the instructional segment and repeat of the problem. An incorrect answer on the second attempt results in feedback and a menu display that asks the student to select whether to repeat the problem again, go on, or quit. An incorrect answer on the third attempt results in the special incorrect answer message, display of the correct answer, and then a menu display that asks the student to select whether to go on or quit.

When the student goes through a lesson for a second or subsequent time, there is an added option to jump directly to the quiz from any question in the instructional component. Help, consisting of how to use the program, how to answer the particular type of question on the screen, glossary, and summary of the lesson focus, is available whenever a question is on the screen. Special Help is intended to explain a procedure in more detail than the main instruction or when an alternative learning strategy is provided to a problem.

Initial programming involved creating a "toolbox" of units that could be invoked from within any lesson to set up and display the appropriate screen characteristics, play video, play second audio, show a still, specify touch zones, overlay directions, show standard response displays for each question type, and branch to Help with return to same location. The toolbox also contained the set of globally defined variables to be used throughout the program. The instructional component additionally required tools for displaying feedback and menus.
The remainder of programming for both the assessment and instruction involved locally defined variables, screen designs, text and any graphics for each problem, answer judging code, and branching sequence for each lesson. For the instructional component it also included feedback messages and related audio, correct answer buffers, and attempt structures.

The record keeping structure provides a menu-driven program for instructors to use to specify the hardware configuration, create class rosters, register students, create a password protected file, delete classes or students, and run the assessment or instructional programs. A full record is kept on each learner who uses the program. Scores are given in each of the 9 lessons and, in the assessment component, for 9 additional cross-test skill categories. Records can be viewed on the screen or printed, if a printer is attached to the computer. Tables 1 and 2 show the student records for the assessment and instructional components. [Complete details are contained in the Working with Math User Documentation included with the videodisc and software package.]

Table 1

<table>
<thead>
<tr>
<th>Working with Math Student Record for Assessment Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jones, CB</td>
</tr>
<tr>
<td>1. Measuring Length................................... /-21 0%</td>
</tr>
<tr>
<td>2. Measuring Perimeter and Area........................... /-9 0%</td>
</tr>
<tr>
<td>3. Measuring Capacity.................................... /-26 0%</td>
</tr>
<tr>
<td>4. Measuring Weight....................................... /-11 0%</td>
</tr>
<tr>
<td>5. Measuring Temperature................................. /-8 0%</td>
</tr>
<tr>
<td>6. Measuring Time......................................... /-10 0%</td>
</tr>
<tr>
<td>7. Money Values (and Relationships)........................ /-15 0%</td>
</tr>
<tr>
<td>8. Money Earned............................................ /-10 0%</td>
</tr>
<tr>
<td>9. Money-Related Forms.................................... /-16 0%</td>
</tr>
<tr>
<td>Total 0/126                                              0%</td>
</tr>
<tr>
<td>Subscores</td>
</tr>
<tr>
<td>1. Reading, Writing, and Comparing Numbers............... 0/5 0%</td>
</tr>
<tr>
<td>2. Computation with Whole Numbers......................... 0/5 0%</td>
</tr>
<tr>
<td>3. Computation with Money Decimals........................ 0/5 0%</td>
</tr>
<tr>
<td>4. Selecting Appropriate Measuring Instrument............ 0/9 0%</td>
</tr>
<tr>
<td>5. Reading Measuring Instruments........................... 0/14 0%</td>
</tr>
<tr>
<td>6. Selecting Correct Computational Procedure............. 0/11 0%</td>
</tr>
<tr>
<td>7. Conversions and Equivalencies........................... 0/18 0%</td>
</tr>
<tr>
<td>8. Metric and Celsius Measurement.......................... 0/9 0%</td>
</tr>
<tr>
<td>9. Problem Solving......................................... 0/36 0%</td>
</tr>
</tbody>
</table>
Table 2  
Working with Math Student Record for Instructional Component

<table>
<thead>
<tr>
<th>INSTRUCTION</th>
<th>QUIZ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TIC</td>
</tr>
<tr>
<td>1. Length</td>
<td>0</td>
</tr>
<tr>
<td>2. Perimeter/Area</td>
<td>0</td>
</tr>
<tr>
<td>3. Capacity</td>
<td>0</td>
</tr>
<tr>
<td>4. Weight</td>
<td>0</td>
</tr>
<tr>
<td>5. Temperature</td>
<td>0</td>
</tr>
<tr>
<td>6. Time</td>
<td>0</td>
</tr>
<tr>
<td>7. Money Values</td>
<td>0</td>
</tr>
<tr>
<td>8. Money Earned</td>
<td>0</td>
</tr>
<tr>
<td>9. Money Forms</td>
<td>0</td>
</tr>
</tbody>
</table>

TIC = Times Instruction Completed  
PASS = Instruction Passed  
#Q = Number of Questions in Quiz  
TQC = Times Quiz Completed

The project staff conducted an in-house review to ensure bug-free operation of the interactive program. Two research assistants at Macro worked through the program and noted any problems with the accuracy or clarity of the program. All needed modifications were made and final programming was completed. The Working with Math package consists of:

1 single-sided math skills assessment videodisc  
1 double-sided math skills instructional videodisc  
seven 5 1/4 inch floppy diskettes  
two 3 1/2 inch floppy diskettes [to be available when published]  
User Documentation describing features and operation of the program.

For either the assessment or instructional component, each student must be provided with paper and pencils or a calculator. All student interaction is done via the touch interface. At no time does the student use the keyboard. All set up procedures for the InfoWindow work station and record keeping functions are to be done by the instructor. An overview of how each component operates follows.

The total time needed to complete the assessment varies from one student to another, but the entire assessment generally will take about 2 hours. At the end of any test, however, a student can select the option to quit. The student's score for that test is stored, and, when the student starts again, the assessment begins with the next test in the sequence. The tests are of various lengths, depending on the complexity of the skills.
related to the particular topic. An idea of the relative length of the tests can be obtained from the number of questions in each:

- Measuring Length 21
- Measuring Perimeter and Area 9
- Measuring Capacity 26
- Measuring Weight 11
- Measuring Temperature 8
- Measuring Time 10
- Money Values and Relationships 15
- Money Earned 10
- Money-Related Forms 16

If a student quits in the middle of a test no score on that test will be recorded. Instructors can press shift-F1 to interrupt the test and return to the record keeping system, but are encouraged to avoid doing this as it adversely affects the validity of the test results. The student will go through the tests in the order in which they are listed above. Once a student has completed a test, his or her record will show the number correct and percent scored on it. However, to obtain accurate information in the cross-test skill categories, the student must complete all tests.

The total time needed to complete all lessons in the instructional program will also vary from one student to another. However, during and at the end of each lesson, a student can select the option to "Quit and Go to the Menu."

The number of questions in the instructional lessons varies considerably depending on the complexity of the skills related to the particular topic. An idea of the relative length of the instructional segments can be obtained from the number of questions the student answers in each of the lessons during the instruction:

- Measuring Length *
- Measuring Perimeter and Area 6
- Measuring Capacity 32
- Measuring Weight 15
- Measuring Temperature *
- Measuring Time 15
- Money Values and Relationships *
- Money Earned *
- Money-Related Forms *

* Indicates lessons on second side of instructional disc, which are not yet available.

If a student quits in the middle of an instructional segment or quiz, no record will be kept for that segment. Pressing shift-F1 returns the user to the lesson menu and pressing shift-F1 again returns the user to the record keeping system.
III. PILOT TEST
III. PILOT TEST

Project staff developed an observation/evaluation form, which was completed for each student who used Working with Math. The form provided a place for recording demographic information and observations regarding behaviors, interactions with the system, interruptions, disruptions, student comments, nature of requests for assistance, etc. After each session, the student was engaged in a brief conversation about the program and subjective ratings were made about the student's attitude toward the program, ability to successfully interact with the system, suitability of the content, and atmosphere of the session. [The Pilot Test Observation and Rating Sheet is contained in Appendix E.]

Due to the expense of the InfoWindow system and its limited availability at locations in the Washington, D.C. area, arrangements were made with the Rock Creek Foundation, Inc. (RCF) to bring students fitting the target population description to Macro's offices for pilot testing during the summer and fall of 1989.

The four subjects were all males, three white and one black, ranging in age from 21 to 49. Two were categorized as low average ability, and two were categorized as mildly mentally retarded. Other disabilities were depression, mixed developmental disorder, and dependent personality disorder. All subjects were working in limited employment areas supported by RCF.

All subjects used paper and pencil during the program, rather than calculators, at the request of RCF. Two subjects completed the assessment in one time block, and two completed it in two sessions approximately one week apart. Completion times for the assessment ranged from one hour and 26 minutes to two hours and 9 minutes. Total correct ranged from 21 to 75 percent. The one session subjects were younger, took 1 hour, 26 minutes and 1 hour, 41 minutes to complete, and scored 40 and 21 percent. The two session subjects were older, took 1 hour, 45 minutes and 2 hours, 9 minutes to complete, and scored 74 and 75 percent. Table 3 shows the main test scores and subscores for each subject.
Table 3

Working with Math Pilot Test Subjects' Assessment Scores

<table>
<thead>
<tr>
<th>MAIN TEST SCORES</th>
<th>Subject 1</th>
<th>Subject 2</th>
<th>Subject 3</th>
<th>Subject 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring Length</td>
<td>95 %</td>
<td>67 %</td>
<td>57 %</td>
<td>43 %</td>
</tr>
<tr>
<td>Measuring Perimeter and Area</td>
<td>56 %</td>
<td>56 %</td>
<td>44 %</td>
<td>0 %</td>
</tr>
<tr>
<td>Measuring Capacity</td>
<td>69 %</td>
<td>73 %</td>
<td>42 %</td>
<td>19 %</td>
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<tr>
<td>Measuring Weight</td>
<td>82 %</td>
<td>82 %</td>
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<td>Measuring Temperature</td>
<td>50 %</td>
<td>88 %</td>
<td>12 %</td>
<td>36 %</td>
</tr>
<tr>
<td>Measuring Time</td>
<td>80 %</td>
<td>90 %</td>
<td>30 %</td>
<td>10 %</td>
</tr>
<tr>
<td>Money Values and Relationships</td>
<td>100 %</td>
<td>100 %</td>
<td>53 %</td>
<td>27 %</td>
</tr>
<tr>
<td>Money Earned</td>
<td>70 %</td>
<td>60 %</td>
<td>40 %</td>
<td>10 %</td>
</tr>
<tr>
<td>Money-Related Forms</td>
<td>44 %</td>
<td>62 %</td>
<td>31 %</td>
<td>12 %</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>SUBSCORES</th>
<th>Subject 1</th>
<th>Subject 2</th>
<th>Subject 3</th>
<th>Subject 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading, writing, &amp; comparing numbers</td>
<td>100 %</td>
<td>100 %</td>
<td>80 %</td>
<td>40 %</td>
</tr>
<tr>
<td>Computation with whole numbers</td>
<td>100 %</td>
<td>100 %</td>
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<td>0 %</td>
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<tr>
<td>Computation with money decimals</td>
<td>80 %</td>
<td>80 %</td>
<td>20 %</td>
<td>0 %</td>
</tr>
<tr>
<td>Selecting appropriate measuring instrument</td>
<td>100 %</td>
<td>78 %</td>
<td>89 %</td>
<td>44 %</td>
</tr>
<tr>
<td>Reading measuring instruments</td>
<td>71 %</td>
<td>86 %</td>
<td>36 %</td>
<td>29 %</td>
</tr>
<tr>
<td>Selecting correct computational procedure</td>
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<td>55 %</td>
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<td>18 %</td>
</tr>
<tr>
<td>Conversions &amp; equivalencies</td>
<td>78 %</td>
<td>72 %</td>
<td>6 %</td>
<td>17 %</td>
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<tr>
<td>Metric &amp; Celsius measurement</td>
<td>44 %</td>
<td>56 %</td>
<td>11 %</td>
<td>44 %</td>
</tr>
<tr>
<td>Problem solving</td>
<td>78 %</td>
<td>78 %</td>
<td>22 %</td>
<td>11 %</td>
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</table>

Following are descriptive accounts of the subjects' interactions with and reactions to the program.

Subject 1: Said he really enjoyed the math program and liked using the touch screen. He said he would like to use a program like this again, but he was not sure that IVD/computer testing was a better way to be tested over conventional methods. He was studying for the GED and mentioned it frequently as a comparison test. He was reluctant to use the paper and pencil at first until the observer reminded him that it was fine to do so. He talked aloud during most of the program as if thinking through the problems, what was being asked for, and how to solve them. He is right-handed and showed no apparent difficulties in responding to any type of question format. His favorite lessons were linear measurement, time, and money values. He felt unsure about metric measurement and Celsius temperature and said he didn't have to know them for the GED. He asked for assistance six times: he wanted to enter a decimal on the number bar; he found the recipe conversion very difficult; he wanted to enter a fraction on the number bar; and he wanted to confirm method of entry on the clock radio.
Subject 2: Said he really enjoyed the math program and liked using the touch screen. He said he would like to use a program like this again, and he thought that IVD/computer testing would be a good way to be tested -- better than conventional methods. He talked aloud during most of the program as if thinking through the problems, what was being asked for, and how to solve them. He is left-handed and showed no apparent difficulties in responding to any type of question format. He touched the screen very hard, and the monitor kept inching toward the right. As this happened, he began to have more trouble entering the numbers he wanted on the bar. The observer straightened the monitor and everything worked fine. He thought money values was very easy. He asked for assistance five times: he didn't understand the confirmation questions; he wanted to enter fractions on the number bar in capacity and weight; he wanted to know how to erase an answer; and he wasn't sure how to enter numbers on the clock radio. Once he asked for help, but before the observer could say anything, he turned back to the screen, touched HELP, and said, "Oh, I can hear it again." When finished, he said, "This intrigues me. I like this test with the TV and all."

Subject 3: Said he really enjoyed the math program and liked using the touch screen. He said he would like to use a program like this again, but he was not sure that IVD/computer testing was a better way to be tested over conventional methods. He repeatedly said he didn't like or know much about measuring, but felt he was pretty good at computation. He worked rapidly and seemed to concentrate quite well. He seemed to become more interested as the tests progressed. He did not "think aloud" during the program. He is right-handed and showed no apparent difficulties in responding to any type of question format. He liked to use the pencil eraser for entering answers. His favorite lesson was time. He asked for assistance two times: he had difficulty touching the blue dots on one of the two high resolution screens, and he became confused when he went out for HELP and touched ANSWERS -- he thought the program had begun again.
Subject 4: Said he was nervous and had never done this before. He said he enjoyed the math program, liked using the touch screen, and would like to use a program like this again. He did not "think aloud" during the program. He paid close attention throughout the program, and didn't even want to take a break. He said people have to be smart to know the metric stuff. He said he was trying to do his best and get everything right, but he knew he was making mistakes. Six times he said, "This is fun." He is right-handed and showed no apparent difficulties in responding to any type of question format. His favorite lesson was linear measurement, and he liked the character of Manny. He asked for assistance seven times: he had difficulty entering a response on the confirmations; wanted to know how to work with the number bar. He said he knew he wasn't getting too many correct, but he knew he was doing better than he would on a paper and pencil test.

The instructional component was pilot tested only in-house by several staff members and teenage children of staff. Several confusing screens and problem operation code were corrected. Since the design automatically recycles on a first attempt incorrect answer and because there are many paths a student can take, it is difficult to provide exact times needed to complete the instructional lessons. However, the times taken to complete the shortest lesson, six practice questions at 20 minutes, and the longest lesson, 36 practice questions at 1 hour and 15 minutes provide a reasonable estimate of the range of time needed for the instructional lessons. The quiz for each lesson operates in a closed structure just like the assessment program, so times are more predictable. The shortest quiz of eight questions took approximately 10 minutes to complete, and the longest quiz with 16 questions took about 20 minutes. RCF has indicated that the four subjects will return to pilot test the instructional component in December 1989, at which time more information will be collected.
IV. DISSEMINATION ACTIVITIES
IV. DISSEMINATION ACTIVITIES

Project staff developed a brochure, "Interactive Videodisc Program to Evaluate and Train Job-Related Math Skills for Transition," which provided essential information about the project. Throughout the project this brochure was distributed to organizations contacted for the review and pilot testing activities; at appropriate conferences and meetings that were attended, including CEC and the Project Director's Meeting in Washington, D.C.; and, upon request from individuals, schools, and rehabilitation centers.

Project staff made a presentation about the analysis, design, and development phases of the project at the 1988 Closing The Gap Annual Conference. The paper submitted for the presentation was published in Closing The Gap (Harris, Robey, & Wholey, 1989). Also at that conference, at the invitation of IBM, the staff demonstrated the Working with Math program throughout the exhibit hall hours.

Throughout the project, the staff demonstrated the Working with Math program to visitors to Macro and upon request to individuals and groups, including personnel from several school districts, CEC, Job Corps, and Ferranti Educational Systems, and a university class. The staff also demonstrated the program in the IBM booth at the International Very Special Arts Festival at the Kennedy Center in Washington, D.C.

Macro anticipates that Working with Math will be published commercially within the next year. Currently, American Guidance Service (AGS), which has the right of first refusal, is reviewing the program in consideration of publication. However, several other publishers are interested in Working with Math and have requested review copies should AGS decline publication.
V. REFERENCES
V. REFERENCES


APPENDIX A
Reviewers
### REVIEWERS

#### AMERICAN VOCATIONAL ASSOCIATION

- **Sheila Teichtner**  
  Vice President, AVA - Special Needs Division  
  FMW Associates
- **James Greenan**  
  Purdue University
- **Gary Greene**  
  California State University
- **Michael Spewock**  
  Center for Vocational Personnel Preparation  
  Indiana University of Pennsylvania

#### VOCATIONAL EDUCATION AND WORK ADJUSTMENT ASSOCIATION (VEWAA)  
MID-ATLANTIC REGION

- **Joseph M. Ashley**  
  Coordinator  
  Project PERT, Woodrow Wilson Rehabilitation Center
- **Karen Pell Ayella**  
  Assessment Specialist  
  OTC-CCC
- **Lynn Rothacker Dowd**  
  Evaluation Team Coordinator  
  Centers for the Handicapped, Evaluation Department
- **Jim Lightner**  
  Evaluator  
  Maryland Rehabilitation Center
- **Rose B. Mestrow**  
  Supervisor - Counseling Unit  
  Hiram G. Andrews Center
- **Nancy Scott**  
  Coordinator of Vocational Services  
  Peninsula Area Cooperative Educational Services (PACES)
- **Frences G. Smith**  
  President, Mid-Atlantic Region VEWAA  
  Evaluator  
  Mt. Vernon Assessment Center
- **Bruce Stroh**  
  Evaluator  
  Mt. Vernon Assessment Center
APPENDIX B
Review Materials
7 December 1987

Dear:

Thank you for agreeing to review the proposed math competencies for Macro's grant to develop an interactive videodisc program for selected vocationally related math competencies.

The product that will result from this project is a videodisc package that provides direct student access to a series of vocational situations. One videodisc will assess abilities to problem solve and determine the correct mathematical answer to a number of specific problems that are likely to occur in a work setting. Another videodisc will present related instruction with review, help, and practice in the target competencies. The materials are intended to meet the needs of youth and young adults with mild mental handicaps in transition from school to work.

Enclosed you will find two lists of mathematical skills. The first list consists of what are commonly referred to as basic skills. We have labeled them Computational and Other Fundamental Skills. They are skills that are used across many occupations as well as in aspects of individual living outside of work. The second list contains skills that involve the use of mathematics in applications that are specific to some subset of the occupations we reviewed. We refer to these as Job-Related Math Application Tasks. In general, these tasks use the computational skills for job-specific purposes, often involving combinations of those skills.

The lists are based on a review of several documents in the field of mathematics and vocational education from which we constructed a database to determine frequencies of skills across jobs. For our purposes, the most useful was *Improving the Basic Skills and Job Awareness of Handicapped Students*, a 1985 final report of a project conducted by the Ohio State University National Center for Research in Vocational Education for the Office of Special Education and Rehabilitation Services. The following materials also were reviewed:

- *Access Skills: Vocational Readiness Skills Inventory for Special Needs Students* (Missouri LINC, 1987)
- *Computerized Vocational Objectives Manual and Data Bank for Students with Special Needs* (Missouri LINC, 1984)
- *Academic Competency Taught in Vocational Education (ACTIVE) Report* (Jean Sillers and Barbara Rupp for the state of Michigan, 1985)
At this point we need your assistance in refining the lists to determine the competencies that will make up the assessment/instructional program. The selected competencies will be presented in realistic vocational situations. The assessment program will use specific probes in a problem solving approach to determine a student's existing skill level in each. The instructional program, which will use the same presentation and approach, will be available for any competency that is not passed at the established standard.

We have designed the rating sheets for the lists of competencies for a yes/no response as to inclusion of each skill or task. Please keep the following in mind as you make your ratings:

1. A Yes should be unqualified. We will count it as a definite response to include.

2. Any skill or task for which you have qualifications should be checked as a No. Then, please check a reason. If one of the three reasons provided does not adequately represent your view, check other. You are encouraged to add notes about your responses; just precede your remarks with the appropriate item number.

Following the rating sheets are questions to which we would like your opinions. Please respond to as many as you can.

We would like to receive your ratings and comments by December 23, 1987. A return envelope is enclosed.

Again, we are most appreciative of your effort on behalf of this project.

Sincerely,

Carolyn DeMeyer Harris
Project Director

Enclosures
**DIRECTIONS:** Read each computational skill and decide if you would or would not include it in an interactive videodisc assessment and instructional program in job-related math skills for mildly mentally handicapped youth in transition from school to work. Check (√) under the column YES or NO. If you answer NO, please check a reason.

<table>
<thead>
<tr>
<th>COMPUTATIONAL AND OTHER FUNDAMENTAL SKILLS</th>
<th>YES</th>
<th>NO</th>
<th>TOO FEW TARGET JOBS REQUIRE</th>
<th>INAPPROPRIATE FOR APPRENTICE</th>
<th>INAPPROPRIATE FOR MEDIUM</th>
<th>OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Read Whole Numbers</td>
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<tr>
<td>2. Write Whole Numbers</td>
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<tr>
<td>3. Compare Whole Numbers</td>
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<td>8. Read Decimals</td>
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<td>9. Write Decimals</td>
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<td>10. Compare Decimals</td>
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<td>11. Add Decimals</td>
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<td>12. Subtract Decimals</td>
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<tr>
<td>13. Multiply Decimals</td>
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<td>14. Divide Decimals</td>
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<tr>
<td>15. Read Fractions</td>
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<tr>
<td>16. Write Fractions</td>
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<td>17. Compare Fractions</td>
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<td>18. Add Fractions</td>
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<tr>
<td>19. Subtract Fractions</td>
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<tr>
<td>20. Multiply Fractions</td>
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<td>25. Use Formulas</td>
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<td>26. Solve Algebra</td>
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<td>27. Read Charts and Tables</td>
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<td>28. Read Graphs</td>
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<tr>
<td>29. Estimate Before Calculating to Determine Reasonableness of Result</td>
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<tr>
<td>30. Round Whole Numbers</td>
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<td>31. Round Rational Numbers (containing fraction or decimal)</td>
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<td>32. Count Items</td>
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<td>33. Count by Multiples</td>
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<td>34. Understand Basic Geometric Concepts</td>
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<td>35. Understand Geometric Properties of Basic Shapes</td>
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**ADDITIONAL COMMENTS**

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B-3
**Directions:** Read each math application task and decide if you would or would not include it in an interactive videodisc assessment and instructional program in job-related math skills for mildly mentally handicapped youth in transition from school to work. Check (✓) under the column YES or NO. If you answer NO, please check a reason.

<table>
<thead>
<tr>
<th>MEASUREMENT</th>
<th>YES</th>
<th>NO</th>
<th>TOO FEW TARGET JOBS REQUIRE</th>
<th>INAPPROPRIATE FOR AUDIENCE</th>
<th>INAPPROPRIATE FOR MEDIUM</th>
<th>OTHER</th>
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<td>9. Estimate Volume</td>
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<td>10. Calculate Volume</td>
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<td>13. Add Angles</td>
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<td>21. Estimate Temperature</td>
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<td>22. Measure Temperature</td>
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<td>23. Regulate Temperature</td>
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<tr>
<td>24. Estimate Time</td>
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<tr>
<td>25. Measure Time</td>
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<tr>
<td>26. Use Measuring Instruments</td>
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<tr>
<td>27. Compare Precision (measurements)</td>
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<tr>
<td>28. Determine Precision (measurements)</td>
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<tr>
<td>29. Measure with Units Used in Only a Few Occupations (Board feet, roofing squares)</td>
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<tr>
<td>30. Alter Scale of Something (up/down)</td>
<td></td>
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<tr>
<td>31. Estimate Materials Needed for Job Completion</td>
<td></td>
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<tr>
<td>32. Calculate Materials Needed so that Waste is Minimized</td>
<td></td>
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<td></td>
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<tr>
<td>33. Estimate Cost of Materials Needed for Job Completion</td>
<td></td>
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<tr>
<td>34. Use Recipes (and other directions requiring measurement)</td>
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</tr>
</tbody>
</table>

**Additional Comments**

**Addition comments B-4**

35
**MEM MEM IP NM= Ella MUM=**

**MUMS:** Read each math application task and decide if you would or would not include it in an interactive videoholic assessment and instructional program in job-related math skills for mildly mentally handicapped youth in transition from school to work. Check (✓) under the column YES or NO. If you answer NO, please check a reason.

<table>
<thead>
<tr>
<th>JOB-RELATED MATH APPLICATION TASKS</th>
<th>YES</th>
<th>NO</th>
<th>TOO FEW TARGET JOBS REQUIRE</th>
<th>INAPPROPRIATE FOR AUDIENCE</th>
<th>INAPPROPRIATE FOR MSN</th>
<th>OTHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>35. Read Blueprints</td>
<td></td>
<td></td>
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<tr>
<td>36. Read Scale Drawings</td>
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<tr>
<td>37. Read Maps</td>
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<tr>
<td>38. Verify Accuracy of Figures and Other Data</td>
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<tr>
<td>39. Compile Data</td>
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<tr>
<td>40. Record Data</td>
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<tr>
<td>41. Summarize Data</td>
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<tr>
<td>42. Maintain Records</td>
<td></td>
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<tr>
<td>43. Use Calculator</td>
<td></td>
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<tr>
<td><strong>MONEY</strong></td>
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<tr>
<td>44. Use Cash Register</td>
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<tr>
<td>45. Count Money</td>
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<tr>
<td>46. Make Change</td>
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<tr>
<td>47. Cash Checks</td>
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<tr>
<td>48. Process Credit Card Purchases</td>
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<tr>
<td>49. Compute Balance Due</td>
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<tr>
<td>50. Compute Credit on Account</td>
<td></td>
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<tr>
<td>51. Compute Percentage</td>
<td></td>
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<tr>
<td>52. Compute Profits</td>
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<tr>
<td>53. Compute Interest</td>
<td></td>
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<tr>
<td>54. Compute Wages</td>
<td></td>
<td></td>
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<tr>
<td>55. Prepare Deposit Slips, Receipts, and Vouchers</td>
<td></td>
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<td></td>
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<tr>
<td>56. Prepare Invoices and Statements</td>
<td></td>
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<tr>
<td>57. Prepare Payroll</td>
<td></td>
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<tr>
<td>58. Record Service Charges</td>
<td></td>
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<tr>
<td>59. Accept Payment</td>
<td></td>
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<td></td>
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<tr>
<td>60. Record Payment</td>
<td></td>
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<td></td>
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<tr>
<td>61. Price Merchandise</td>
<td></td>
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<tr>
<td>62. Determine Shipping Charges</td>
<td></td>
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<td></td>
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<tr>
<td>63. Place Orders</td>
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</tbody>
</table>

**ADDITIONAL COMMENTS**

---

**B-5**
1. What standard would you recommend as the percentage for passing each assessment section?

2. Would you provide a calculator for use:
   a. throughout the assessment program?  
      YES  NO  QUALIFIED
   b. throughout the instructional program?  
      YES  NO  QUALIFIED

QUALIFICATIONS:

2A. If YES to one or both -- Would you prefer:
   a. an on-screen calculator that always would be available.
   b. a hand-held calculator provided by the instructor when desired.

3. The general consensus on treatment of traditional and metric measurements is that they should be presented separately. Conversion should not be emphasized. Linking should be minimal and address only broad concepts of equivalents, e.g., a meter is about the same length as a yard.

   If you have additional information to aid our design of this section, please comment.

4. The ability to estimate the reasonableness of an answer is important and one that should be emphasized throughout mathematics problem solving. Our preliminary design for both assessment and instruction incorporates estimation into each problem in the following way:

   - Presentation of a job-related math problem
   - Student input #1: Which operation would you use?  (multiple choice)
   - Student input #2: Estimate your answer.  (numeric keypad entry)
   - Student input #3: Compute the actual answer.  (numeric keypad entry)

   Thus, there will be three scores for each student. Item feedback will be provided only in the instructional program. There will be a separate instructional module on estimation to be used at the option of the instructor.

   If you have additional information to guide our decision on this, please comment.

5. For each of the following we have estimated an appropriate range given the target audience. If you have additional information to guide our decision on these, please comment.

<table>
<thead>
<tr>
<th>OPERATIONS: maximum number of digits without calculator</th>
<th>TRADITIONAL SYSTEM: smallest - largest unit</th>
<th>METRIC SYSTEM: smallest - largest unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addition 3-digit addends</td>
<td>ounce to gallon</td>
<td>gram to kilogram</td>
</tr>
<tr>
<td>Subtraction 3-digit minuend &amp; subtrahend</td>
<td>1/16 of an inch to mile</td>
<td>centimeter to kilometer</td>
</tr>
<tr>
<td>Multiplication 3-digit multiplicand; 2-digit multiplier</td>
<td>ounce to ton</td>
<td>milliliter to liter</td>
</tr>
<tr>
<td>Division 3-digit dividend; 2-digit divisor</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. In dealing with temperature, should both Fahrenheit and Celsius be presented?  YES  NO

   If NO, which one should be included?
APPENDIX C
Assessment Working Scripts
TO
FINAL REPORT
AN INTERACTIVE VIDEODISC PROGRAM TO
EVALUATE AND TRAIN JOB-RELATED
MATH SKILLS FOR TRANSITION
FOR
GRANT #G008730292

Submitted to:
U.S. Department of Education
Office of Special Education Programs

Carolyn DeMeyer Harris
Elaine Robey
Kathleen Wholey
Robert Pels
Macro Systems, Inc.

November 30, 1989
APPENDIX C CONTENTS
Assessment Working Scripts

1. INTRODUCTION

2. MEASURING LENGTH [LM]
   Determining How Much You Have (Traditional)
   Measuring Out a Specific Quantity (Traditional)
   Using Common Metric Linear Measurements

3. MEASURING PERIMETER AND AREA [GM]
   Finding Perimeter and Area of Rectangles
   Finding Perimeter of Polygons Other Than Rectangles

4. MEASURING CAPACITY [CM]
   Determining How Much You Have (Traditional)
   Measuring Out a Specific Quantity (Traditional)
   Using and Modifying Recipes and Other Directions
   Using a Common Metric Capacity Measurement

5. MEASURING WEIGHT [WM]
   Determining How Much You Have (Traditional)
   Measuring Out a Specific Quantity (Traditional)
   Using a Common Metric Weight Measurement

6. MEASURING TEMPERATURE [PM]
   Using the Fahrenheit Scale
   Using Common Celsius Scale Measurements

7. MEASURING TIME [TM]
   Telling Time
   Scheduling Time
   Determining Elapsed Time

8. MONEY VALUES AND RELATIONSHIPS [MV]
   Reading Money Values
   Counting Money
   Knowing Money Equivalencies
   Making Change

9. MONEY EARNED [ME]
   Computing Wages
   Calculating Overtime Pay
   Computing Tips
   Determining Gross Earnings
   Computing Net Pay

10. MONEY-RELATED FORMS [MF]
    Completing Order Forms
    Using a Tax Chart, Shipping Chart, and Sales Tax Chart
    Recording Payment and Computing Balance Due
    Preparing a Deposit Slip
NARRATOR: 1ST AUDIO

Math is used a lot in the working world. We use math to measure length, capacity, weight, and temperature. We also use math to tell time. And, we use math to deal with money - both the money we earn and the money we handle in our jobs.

This program deals with how much work-related math you know. It will help you find out if there are any areas you need to work on.

The four workers you'll see are faced with job problems that use math. But, first, here is information on how to work with this program.

Math is used a lot in the working world.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aikki</td>
<td>Tom</td>
</tr>
<tr>
<td>using yardstick</td>
<td>looking at thermometer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>B.J.</td>
<td>Money</td>
</tr>
<tr>
<td>showing the motor you've bought</td>
<td>looking at meter &amp; setting club radio</td>
</tr>
</tbody>
</table>
We use math to measure length, capacity, ...

...weight, and temperature.

NARRATOR: 1ST AUDIO OYER FULL SCREEN VIDEO FROM TOP LEFT STILL #1A

NARRATOR: 1ST AUDIO OYER FULL SCREEN VIDEO FROM TOP RIGHT STILL #1B
We also use math to tell time.

And, we use math to deal with money - both the money we earn...
NARRATOR: 1ST AUDIO OVER FULL SCREEN VIDEO FROM TOP LEFT STILL *2A
...and the money we handle in our jobs.

2A

Tricki: taking money from Mr. Houston

NARRATOR: 1ST AUDIO OVER FULL SCREEN VIDEO FROM TOP RIGHT STILL *2B
This program deals with how much work-related math you know.

2B

Tom looking at floor plan & circling area of interest
NARRATOR: 1ST AUDIO OVER FULL SCREEN VIDEO FROM BOTTOM RIGHT STILL #2C
It will help you find out if there are any areas you need to work on.

The four workers you'll see are faced with job problems that use math.

B.J. adding trail not to scale
But, first, here is information on how to work with this program.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nikki taking money</td>
<td>Sam looking at floor plan</td>
</tr>
<tr>
<td>from the bank</td>
<td>floor plan &amp; circular area</td>
</tr>
<tr>
<td>D</td>
<td>C</td>
</tr>
<tr>
<td>B.J. adding trail</td>
<td>Money measuring one</td>
</tr>
<tr>
<td>mix to scale</td>
<td>ingredient</td>
</tr>
</tbody>
</table>

You will always touch the screen to answer the questions. But, you'll touch it in different ways for different kinds of questions. This is a demonstration to show you examples of the questions and how to answer them. Don't worry, though. When you're working in the program, each question always has directions for you.

For multiple choice questions you will touch the blue dot next to the answer you want. Look at the first example.

How many inches equal one foot?
- There are four choices, but twelve inches is the correct answer.
- So, you touch the blue dot next to that choice.
- The dot changes color to show that your answer has been entered.
- And, the program goes on.

Yes-No questions work the same way.
- Are there twelve inches in one foot?
- When you touch the blue dot, it changes color.
- And, the program goes on.

Sometimes, the choices are shown as pictures, but they work the same way.
- Which picture shows one foot?
You touch the blue dot next to the answer you want. It changes color.
And, the program goes on.

Some questions want you to answer by touching a certain place on the screen. For example:
On this pay stub, you’re asked how much was deducted for state taxes?
You find the amount on the pay stub and touch that number.
It changes color...
...and also shows up in the answer box.
Then, the program goes on.

You’ll answer some questions by touching numbers on a bar and then touching the “enter” box. For example:
How many inches equal one foot?
Your answer is “twelve.” So, you touch one, and then two.
The numbers show up in the answer box.
You check the box to make sure it’s the answer you want.
Oops! It’s the wrong number.
When this happens, just touch the “retry” box, and the problem will start over.

Now the answer is correct.
You touch “enter.”
It changes color.
And, the program goes on.

Some questions want you to figure out how much of something you need for a job. You touch a picture as many times as you need to and then touch “enter.” For example:
How many times should you fill this cup to measure three cups of milk?
You see that it holds one cup and you want three cups.
So, you touch it three times.
The cups show up in the answer box.
You check the box to make sure it’s the answer you want. Three cups is correct.
So, you touch “enter.”
And, the program goes on.
Do you want to try a sample question for yourself? Touch the blue dot next to your answer.

You've got it!
How many inches equal one foot? Touch the blue dot next to the correct answer.

You've probably noticed that each question has a "help" box. You can choose to get help:
- Touching "Answers" describes how to work with this program and answer the different kinds of questions.
- Touching "Section Summary" provides a short explanation of the kind of math problems you'll have in that section.
- Touching "Glossary" gives definitions of some of the unusual or difficult words used in the program.

If there is some other help available, you can see it by touching "Special."

Try to answer every question. If you don't answer, a message will ask you to respond.

Work carefully and do your best. Good luck!
For multiple choice questions you will touch the blue dot by the answer you want. Look at the first example.

[1] How many inches equal one foot?
[2] There are four choices, but twelve inches is the correct answer.
[3] So, you touch the blue dot next to that choice.
[4] The dot changes color to show that your answer has been entered.
[5] And, the program goes on.

NARRATOR: 2ND AUDIO

Yes-No questions work the same way.

[1] Are there twelve inches in one foot?
[2] When you touch the blue dot, it changes color.
[3] And, the program goes on.
NARRATOR: 2ND AUDIO

Sometimes, the choices are shown as pictures, but they work the same way.

[1] Which picture shows one foot?
[2] You touch the blue dot next to the answer we want.
[3] It changes color.
[4] And, the program goes on.

![Diagram showing a question and answer choices with a blue dot to touch.]

NARRATOR: 2ND AUDIO

Some questions want you to answer by touching a certain place on the screen. For example:

[1] On this pay stub, you're asked how much was deducted for state taxes?
[2] You find the amount on the pay stub and touch that number.
[3] It changes color...
[4] ...and also shows up in the answer box.
[5] Then, the program goes on.

![Diagram showing a pay stub with a question asking for state tax amount.]

HELP
NARRATOR: 2ND AUDIO
You'll answer some questions by touching numbers on a bar and then touching the "enter" box. For example:
[1] How many inches equal one foot?
[2] Your answer is "twelve." So, you touch one, and then two.
[3] The numbers show up in the answer box.
[4] You check the box to make sure it's the answer you want.
[5] Oops! It's the wrong number.
[6] When this happens, just touch the "retry" box.
[7] And the problem will start over.

How many inches equal 1 foot?

[1 3] inches

[8] Now the answer is correct.
[9] You touch "enter."
[10] It changes color.
Some questions want you to figure out how much of something you need for a job. You touch a picture as many times as you need to and then touch "enter." For example:

[1] How many times should you fill this cup to measure three cups of milk?
[2] You see that it holds one cup and you want three cups.
[3] So, you touch it three times.
[4] The cups show up in the answer box.
[5] You check the box to make sure it's the answer you want. Three cups is correct.
[6] So, you touch "enter."
[7] And, the program goes on.
NARRATOR: 2ND AUDIO
Do you want to try a sample question for yourself? Touch the blue dot next to your answer.

Do you want to try a sample question for yourself?
- Yes
- No
Touch the blue dot next to your answer.

NARRATOR: 2ND AUDIO
You've got it!
How many inches equal one foot? Touch the blue dot next to the correct answer.

How many inches equal 1 foot?
- 3 inches
- 6
- 12
- 24
Touch the blue dot next to the correct answer.
You've probably noticed that each example has a "help" box. You can choose to get three kinds of help:

1. Touching "Answers" describes how to work with this program and answer the different kinds of questions.
2. Touching "Section Summary" provides a short explanation of the kinds of math problems you'll have in that section.
3. Touching "Glossary" gives definitions of some of the unusual or difficult words used in the program.
4. If there is some other help available, you can see it by touching "Special."

Try to answer every question. If you don't answer, a message will ask you to respond.

You need to answer.

Do you want to answer this question?

- Yes, I do.
- No, I want to skip it.
NARRATOR: 2ND AUDIO

Work carefully and do your best. Good luck!
Please record each of these for placement throughout the 2nd audio track - 3 or 4 times

You need to answer.

Try to answer the question.

Go ahead -- make your best guess.

You might want to touch the help box.

Do you want to answer this question? Touch "yes" if you do. Touch "no" if you want to skip it.
Linear Measurement: Determining How Much You Have, Traditional
and Measuring Out a Specific Quantity, Traditional
Scene LM-1
Character 4, Nikki
Character 8, customer, Ms. Jesse Houston
Small gallery/frame shop

Nikki is working behind the counter, which has a metal yardstick attached along edge, a 12-inch ruler, a metal tape measure, a yardstick (wood or metal), an order pad, a sales pad, stickers for writing prices, various pens and pencils, roll of double-sided tape, spool of wire, and a cash box. A frequent customer, Ms. Houston, enters carrying a bag with items in it and a rolled picture held with a rubber-band or clips. She has a shoulder purse.

NIKKI
(looking up toward door) Hi, Ms. Houston. How are you doing?

MS. HOUSTON
(walking toward counter) I'm fine, Nikki. (reaches counter and lays down bag and rolled picture) Is Miss Adams in? I have some things to be framed.

NIKKI
No, but she'll be in later today. I can take the measurements and write up your order, though. Miss Adams will call you if she has any questions.

MS. HOUSTON
That sounds good, Nikki.

Ms. Houston reaches into bag, pulls out a postcard, and holds it out toward Nikki

A friend sent this postcard to me, and I like it so much that I want it framed.
Nikki nods, takes postcard and lays it on counter.
Ms. Houston reaches into bag, pulls out needlework piece, and opens up to show Nikki

[MS. HOUSTON, continued]
I just finished this, and I want it framed, too

NIKKI
You do nice work, Ms. Houston.
(takes needlework and lays it on counter)

MS. HOUSTON
(points to rolled picture laying on counter) And, this is a poster I keep forgetting to bring in.

NIKKI
I'll measure these first, and then you can pick out the frames and any mats you want.

MS. HOUSTON
Fine. I want to look around, and there are some small things I need when you've finished.

NIKKI
Okay.

Ms. Houston exits picture.
Nikki spreads each picture out on counter; takes postcard and places directly in her working space.

Nikki looks at various measurement instruments. Fade or still.
Which measuring instrument is most appropriate for Nikki to use with the postcard? Touch the blue dot next to the correct instrument.

Which measuring instrument is the most appropriate for Nikki to use? Touch the blue dot next to the correct picture.

VIDEO: Nikki picks up ruler

NIKKI
I'll use the ruler for this.
NARRATOR VO - 2ND AUDIO
What is the correct way for Nikki to measure the longer side of the postcard? Touch the blue dot next to the correct picture.

TEXT:
WHAT IS THE CORRECT WAY FOR NIKKI TO MEASURE THE LONGER SIDE OF THE POSTCARD? TOUCH THE BLUE DOT NEXT TO THE CORRECT PICTURE.

What is the correct way for Nikki to measure the longer side of the postcard?
Touch the blue dot next to the correct picture.

Is this the answer you want? Touch the blue dot next to your answer.

Is this the answer you want?
• Yes  • No
Touch the BLUE DOT next to your answer.
WHERE SHOULDNIKKI STOP MEASURING
THE LONGER SIDE OF THE POSTCARD?
TOUCH THE RULER OR THE CARD AT THE
CORRECT PLACE.

IS THIS THE ANSWER YOU WANT?
TOUCH THE BLUE DOT NEXT TO YOUR
ANSWER.
NARRATOR VO - 2ND AUDIO

What is the length of the longer side of the postcard? Touch the correct number on the ruler.

Is this the answer you want?

Touch the blue dot next to your answer.

HELP

Yes

No

I want to start over
NARRATOR VO- 2ND AUDIO
What is the correct way for Nikki to measure the shorter side of the postcard?

TEXT:
WHAT IS THE CORRECT WAY FOR NIKKI TO MEASURE THE SHORTER SIDE OF THE POSTCARD? TOUCH THE BLUE DOT NEXT TO THE CORRECT PICTURE.
NARRATOR VO - 2ND AUDIO
Where should Nikki start measuring the shorter side of the postcard? Touch the card at the correct place.

TEXT:
WHERE SHOULD NIKKI START MEASURING THE SHORTER SIDE OF THE POSTCARD? TOUCH THE CARD AT THE CORRECT PLACE.

postcard

Where should Nikki start measuring the shorter side of the postcard? Touch the card at the correct place.

NARRATOR VO - 2ND AUDIO
Is this the answer you want?

TEXT:
IS THIS THE ANSWER YOU WANT? TOUCH THE BLUE DOT NEXT TO YOUR ANSWER.

postcard

Is this the answer you want?
• Yes  • No
Touch the BLUE DOT next to your answer.
NARRATOR VO - 2ND AUDIO
Where should Nikki stop measuring the shorter side of the postcard? Touch the ruler or the card at the correct place.

TEXT:

NARRATOR VO - 2ND AUDIO
Is this the answer you want?

TEXT:
IS THIS THE ANSWER YOU WANT? TOUCH THE BLUE DOT NEXT TO YOUR ANSWER.
NARRATOR VO - 2ND AUDIO
What is the length of the shorter side of the postcard? Touch the correct number on the ruler.

TEXT:
WHAT IS THE LENGTH OF THE SHORTER SIDE OF THE POSTCARD? TOUCH THE BLUE DOT NEXT TO THE CORRECT NUMBER ON THE RULER.

Is this the answer you want?

TEXT:
IS THIS THE ANSWER YOU WANT? TOUCH THE BLUE DOT NEXT TO YOUR ANSWER.

postcard

What is the length of the shorter side of the postcard?
Touch the correct number on the ruler.

- 2½ inches
- 3½ inches
- 4½ inches
- 5½ inches

postcard

Is this the answer you want?

- Yes
- No

Touch the BLUE DOT next to your answer.

HELP

I want to start over.

LM-11
VIDEO - Nikki writes a number on order form and sets postcard aside. She moves needlework directly into her work space...

NIKKI
Moving right along

...and looks at various measurement instruments. Fade or still.

GRAPHICS AND LABELS OF THREE INSTRUMENTS ACROSS TOP HALF TO TWO-THIRDS OF SCREEN

NARRATOR VO 2ND AUDIO
Which measuring instrument is most appropriate for Nikki to use with the needlework? Touch the blue dot next to the correct instrument.

TEXT:
WHICH MEASURING INSTRUMENT IS MOST APPROPRIATE FOR NIKKI TO USE WITH THE NEEDLEWORK? TOUCH THE BLUE DOT NEXT TO THE CORRECT INSTRUMENT.

VIDEO: Nikki picks up tape measure

NIKKI
I should use the tape measure for this.

LM-12
NARRATOR VO - 2ND AUDIO

What is the length of the shorter side of the needlework?

TEXT:

WHAT IS THE LENGTH OF THE SHORTER SIDE OF THE NEEDLEWORK? TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.

| 12 inches | 18 inches |
| 15 inches | 51 inches |

add 1/4 to each
The shorter side of the needlework is fifteen and one-fourth inches. How much is that in feet and inches?

Touch the blue dot next to the correct answer.

- 2 ft. 1 in.
- 5 ft. 1 in.
- 1 ft. 5 in.
- 1 ft. 3 in.
NARRATOR VO - 2ND AUDIO

What is the length of the longer side of the needlework?

TEXT:
WHAT IS THE LENGTH OF THE LONGER SIDE OF THE NEEDLEWORK? TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.

- 12 inches
- 17 inches
- 20 inches
- 21 inches

VIDEO - Nikki puts poster directly into her work space, looks at various measurement instruments, and picks up yardstick.

ZOOM-IN ON POSTER AND NIKKI'S HAND WITH YARDSTICK TO STILL
**Narrator VO: 2nd Audio**

What is the length of the shorter side of the poster?

**Text:**

What is the length of the shorter side of the poster? Touch the blue dot next to the correct answer.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>24 inches</td>
<td>34 inches</td>
</tr>
<tr>
<td>26 inches</td>
<td>36 inches</td>
</tr>
</tbody>
</table>
**NARRATOR VO - 2ND AUDIO**

What is the length of the longer side of the poster?

TEXT:

WHAT IS THE LENGTH OF THE LONGER SIDE OF THE POSTER?
TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.

<table>
<thead>
<tr>
<th>Options</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 inches</td>
<td>add $\frac{1}{2}$</td>
</tr>
<tr>
<td>26 inches</td>
<td></td>
</tr>
<tr>
<td>34 inches</td>
<td></td>
</tr>
<tr>
<td>36 inches</td>
<td></td>
</tr>
</tbody>
</table>
RULER DISAPPEARS AND CORRECT LENGTH MEASUREMENT IN INCHES APPEARS.

NARRATOR VO - 2ND AUDIO
You measured the length of the longer side of the poster in inches. How long is the longer side of the poster in inches?

Corrected NARRATOR VO
The longer side of the poster is thirty-four and one-half inches. How much is that in feet and inches?

TEXT:

<table>
<thead>
<tr>
<th>What is the length of the longer side of the poster in feet and inches? Touch the blue dot next to the correct answer.</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 1 ft. 14 in.</td>
</tr>
<tr>
<td>• 2 ft. 10 in.</td>
</tr>
</tbody>
</table>

PROPS:

2 metal yardsticks
12-inch ruler
metal tape measure
something to hold one of yardsticks to counter
order pad
sales pad with separate $ & ¥ columns

LM-18
price stickers
several pens & pencils in holder
spool wire
roll double-sided tape
cash box
postcard
needlework
2 copies of poster - 1 rolled & held with rubber bands, 1 flat
bag for customer to carry items - Giant bag
shoulder purse
woman’s wallet or change purse with at least:
  2 ones, 9 quarters, 12 dimes, 6 nickels, 13 pennies
a display board with packaged items for sale:
  1 roll brown paper, 1 prepackaged mat, 1 pkg screw eyes, 9
  pkg picture hangers
Linear Measurement: Determining How Much You Have, Traditional
and Measuring Out a Specific Quantity, Traditional
Scene LM-2
Character 4, Nikki
Character 8, customer, Ms. Jesse Houston
Small gallery/frame shop

VIDEO - Ms. Houston is at counter to which several mat and frame
samples have been added. Off to one side near Ms. Houston, there
is a package of eye screws, a hanger, and a box of hooks. Nikki is
finishing the order form and looks up.

NIKKI
Well, I think this should look
really good, Ms. Houston.

MS. HOUSTON
I do, too, Nikki (voice should rise
just slightly on “too” indicating
agreement - should not be haughty).
Now, I need some things for a
project I want to do myself.
(slight pause). I’d like ten feet of
hanging wire and a foot-and-a-half
of double-sided tape.

NIKKI
Okay, that’s ten feet of hanging
wire (touches spool of wire) and
a foot-and-a-half of double-sided
tape (touches roll of tape).

Nikki pulls out wire along edge of mounted yardstick on counter;
she should measure one yard, move right hand over to left
position, and begin pulling out second yard

ZOOM-IN ON NIKKI’S HAND, WIRE, AND YARDSTICK TO STILL
Ms. Houston wants ten feet of hanging wire. How much is that in yards and feet?

TEXT SCREEN:
Ms. Houston wants 10 feet of hanging wire. How much is that in inches? Touch the blue dot next to the correct answer.

- 10 inches
- 12 inches
- 100 inches
- 120 inches

Touch the blue dot next to the correct answer.
NARRATOR VO - 2ND AUDIO
Ms. Houston wants a foot-and-a-half of double-sided tape. How many inches is that? in inches?

TEXT SCREEN:
MS. HOUSTON WANTS 1 1/2 FEET OF DOUBLE-SIDED TAPE. HOW MUCH IS THAT IN INCHES? TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
- ...12 inches
- ...18 inches
- ...20 inches
- ...24 inches

VIDEO: wire is laying on counter, coiled with price tag on it; Nikki is coiling the tape

NIKKI
(as if to self) All right, done. Now I just need to put a price tag on this.

FADE

[Money Values - MV - continues story line]
NARRATOR VO - 2ND AUDIO

Nikki has been using the traditional system to measure length in inches, feet, and yards. The metric system is another measurement system that you may have to work with. Answer the following questions about metric length. They are multiple choice. Just touch the blue dot next to the correct answer.

WHAT METRIC UNIT IS ABOUT THE SAME AS A YARD?
- centimeter
- meter
- millimeter
- kilometer

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
How many centimeters are equal to 1 meter?

Text:
HOW MANY CENTIMETERS ARE EQUAL TO 1 METER?
- 10 centimeters
- 50 centimeters
- 100 centimeters
- 500 centimeters
TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
How many meters equal one kilometer?

**TEXT:**

**HOW MANY METERS EQUAL 1 KILOMETER?**

- 100 meters
- 1000 meters
- 1760 meters
- 5280 meters

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
What metric unit is about the same as two-thirds of a mile?

- centimeter
- meter
- millimeter
- kilometer

Touch the blue dot next to the correct answer.

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PROPS: [add to LM-1]

several mat samples
several frame samples
coil of wire (10 ft) with price tag of on it
Finding Perimeter and Area of Rectangles
Scene GM - 1
Character 1, Tom
Character 5, Mr. Al Richmond
Inside House in Living Room (Family Room?)

Tom and Mr. Richmond are standing in the kitchen near the kitchen table (or a cleared off counter). Mr. Richmond is holding a clipboard which has a copy of the floorplan for the house on it.

MR. RICHMOND
Before we get started today, I'd really like to order the supplies that we'll need for some of the work we still have to do.

TOM
What's left, Mr. Richmond?

MR. RICHMOND
Well, let's see. Outside we need to put up the fence trim the owners want and inside we still have to lay that vinyl flooring in the family room and put in new baseboards. Let's figure out how much of the flooring materials we need first. I have a copy of the floorplan.

He pulls the floorplan off the clipboard.

MR. RICHMOND
You can figure out how much to order from this.

He hands Tom the floorplan.

MR. RICHMOND
See you in a few minutes.

Tom lays floorplan on the kitchen counter.

GO IN TO CLOSEUP OF FLOORPLAN and Tom's finger.

TOM
Okay, here's the room we need to order the baseboards and the flooring for. (Tom's index finger circles the room on the floorplan.)

GO TO CLOSEUP OF THE ROOM IN QUESTION ON THE FLOORPLAN.
What does Tom need to do to find out how many feet of baseboard molding to order? Touch the blue dot next to the correct answer.

- Should: Multiply 9 x 15
- Add 9 + 9 + 15 + 15
- Add 9 + 15 + 6 + 15
- Multiply 6 x 15

Touch the blue dot next to the correct answer.

Following student response, the selected answer changes color on revised text screen. (Note: This is still a split screen as above.)

Is this the answer you want? Touch the blue dot next to your answer.

- Yes
- No

Touch the blue dot next to your answer.
WHATEVER THE STUDENT FINALLY SELECTS COMES UP ON FULL TEXT SCREEN SUCH AS:

NARRATOR VO - 2ND AUDIO

Work out the answer to this problem to find out how much molding to order. Touch the numbers on the bar to answer. When you're done, touch Enter.

TEXT SCREEN:

WORK OUT THE ANSWER TO THIS PROBLEM TO FIND OUT HOW MUCH MOLDING TO ORDER.

9
15
6
+ 15

(RESPONSE WINDOW HERE)

TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE, TOUCH ENTER.

-------------------------------

TOM

Well that's taken care of. Now I need to figure out how much sheet vinyl Mr. Richmond should order. I don't want to order too much, but I need to be careful so that we have enough.

GO TO CLOSEUP OF FLOORPLAN AND FREEZE ON ROOM IN QUESTION.

VERTICAL SPLIT SCREEN WITH STILL (OR GRAPHIC) OF FLOORPLAN ON LEFT AND TEXT SCREEN ON RIGHT.

NARRATOR VO - 2ND AUDIO

What does Tom need to do to find out how many square feet of vinyl flooring to order?

TEXT:

IMAGE OF FLOORPLAN WITH FOCUS ON FAMILY ROOM (STILL OR GRAPHIC)

WHAT DOES TOM NEED TO DO TO FIND OUT HOW MANY SQUARE FEET OF VINYL FLOORING TO ORDER?

o MULTIPLY 6 x 15
o ADD 9 + 15 + 6 + 15
o MULTIPLY 9 x 15
o ADD 9 + 9 + 15 + 15

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
WHAT DOES TOM NEED TO DO TO FIND OUT HOW MANY SQUARE FEET OF VINYL FLOORING TO ORDER?

SAME OPTIONS AS ABOVE WITH SELECTED ANSWER A BRIGHTER COLOR. (Note: If space is tight, only selected answer will remain.)

IS THIS THE ANSWER YOU WANT?

o YES  o NO

TOUCH THE BLUE DOT NEXT TO YOUR ANSWER.

WHATEVER THE STUDENT HAS SELECTED COMES UP ON A FULL TEXT SCREEN SUCH AS:

NARRATOR VO - 2ND AUDIO

WORK OUT THIS PROBLEM TO FIND OUT HOW MANY SQUARE FEET OF VINYL TO ORDER. Touch the numbers on the bar to answer. When you're done, touch enter.

TEXT SCREEN:

WORK OUT THE ANSWER TO THIS PROBLEM TO FIND OUT HOW MANY SQUARE FEET OF VINYL TO ORDER.

15
x 9

----------

(RESPONSE WINDOW HERE)

TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE, TOUCH ENTER.
TOM

Hmmm. I wonder if Mr. Richmond wanted this measurement in square feet or square yards. Maybe I should figure out how many square yards it would be. Then I can tell him both and let him decide.

TEXT SCREEN APPEARS.

NARRATOR VO - 2ND AUDIO

What does Tom need to do to find out how many square yards of vinyl are needed?

REMEMBER, YOU SAID HE NEEDED (PREVIOUS ANSWER) SQUARE FEET.

- Divide (Previous Answer) / 3
- Multiply (Previous Answer) \times 9
- Multiply (Previous Answer) \times 5
- Divide (Previous Answer) / 9

Touch the blue dot next to the correct answer.

FOLLOWING STUDENT RESPONSE, THE SELECTED ANSWER CHANGES COLOR ON REVISED TEXT SCREEN.

NARRATOR VO (2ND AUDIO)

Is this the answer you want?

Touch the blue dot next to your answer.

Whatever the student has selected comes up on full text screen such as:

80
Work out the answer to this problem to find out how many square yards of vinyl are needed.

WORK OUT THE ANSWER TO THIS PROBLEM TO FIND OUT HOW MANY SQUARE YARDS OF VINYL ARE NEEDED.

TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE, TOUCH ENTER.

Tom is writing some figures down on a piece of paper next to the floorplan.

TOM
Well, I think I'm ready to give these to Mr. Richmond and net my next assignment.

Tom walks out of the room to find Mr. Richmond.

PROP LIST FOR GM - 1:
Clipboard
Pencil
Scratch Paper (Yellow,Lined?)
Blank Order forms
Floorplan
Pen
Scratch Paper (Yellow lined)
Finding Perimeter: Of Polygons Other than Rectangles

Scene GM - 2
Character 1. Tom
Character 5. Mr. Al Richmond
Outside House (In backyard near fence)

Tom and Mr. Richmond are in the back yard near the fence. Mr. Richmond is holding a clipboard on which he is writing (maybe working on his order form). Tom walks up and approaches Mr. Richmond. Tom is carrying a piece of paper (same piece of paper he was writing on in previous scene), the scratchpad, pencil and floorplan.

TOM
Oh, Mr. Richmond. I finished figuring out how much vinyl flooring and molding we need.

Tom hands the piece of paper to Mr. Richmond.

MR. RICHMOND
Good, Tom. Now we need to figure out how much fence trim to order.

Mr. Richmond picks up the fence trim sample to demonstrate its positioning on the fence.

MR. RICHMOND
We'll attach this trim along the top of the fence that's already here, like so.

TOM
That'll look nice.

MR. RICHMOND
Yes, it will. Now the fence trim comes in 6 foot sections. So figure out how many feet of fence are already here. Then figure out how many sections of trim we need to order.

TOM
Do you have the big tape measure so I can measure the fence.

MR. RICHMOND
You can use the scale drawing of the house that I gave you. The fence line is shown on there too. Let me know when you're done. I'll probably be in the ...
Mr. Richmond walks away. Tom puts the plat down on the bench on the deck and then kneels down on the deck itself.

GO TO CLOSEUP OF FLOORPLAN (SCALE DRAWING).

Tom runs his finger along the fenceline shown on the drawing.

TOM
The trim needs to be along the whole fence. So -- I can just use the fence measurements from the drawing to figure out how much to order.

drawing to figure out how much to order.

GO TO CLOSEUP OF THE SCALE DRAWING ALONE.

VERTICAL SPLIT SCREEN WITH STILL (OR GRAPHIC) OF PLAT ON LEFT AND TEXT SCREEN ON RIGHT.

NARRATOR VO - 2ND AUDIO

WHAT DOES TOM NEED TO DO TO FIND OUT HOW MANY FEET OF FENCE TRIM TO ORDER?

o ADD 42 + 42 + 54
o MULTIPLY 42 \times 42
o MULTIPLY 42 \times 54
o ADD 6 + 42 + 42 + 54 + 6

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER

================================================================================================
FOLLOWING STUDENT RESPONSE. THE SELECTED ANSWER CHANGES COLOR ON REVISED TEXT SCREEN. (NOTE: THIS IS STILL A SPLIT SCREEN AS ABOVE.)

NARRATOR VO - 2ND AUDIO
Is this the answer you want? No change

IMAGE OF SCALE DRAWING WITH FOCUS ON FENCE LINE (STILL OR GRAPHIC)

IS THIS THE ANSWER YOU WANT?

o YES  o NO

TOUCH THE BLUE DOT NEXT TO YOUR ANSWER.

WHATEVER THE STUDENT HAS SELECTED COMES UP ON FULL TEXT SCREEN SUCH AS:

NARRATOR VO - 2ND AUDIO
Work out the answer to this problem to find out how much fence trim to order.

TEXT SCREEN:
WORK OUT THE ANSWER TO THIS PROBLEM TO FIND OUT HOW MUCH FENCE TRIM TO ORDER.

6
42
42
54
+ 6

(TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE, TOUCH ENTER.)
Tom needs to determine how many 6-foot sections of fence trim to order. To find the answer, he should:

1. Multiply the previous answer by 6.
2. Divide the result by 6.
3. Multiply the result by 12.
4. Divide the final result by 12.

Tom believes he has figured it out now. He will take this to Mr. Richmond and continue with the painting tasks for the day.

Tom picks up the plot, scratch paper, and pencil and heads to look for Mr. Richmond.
Capacity Measurement
Scene CM-1
Character 2, Manny
Character 6, Mrs. Young
Kitchen

VIDEO - Scene opens with CU of recipe Manny is about to start making. Manny has gotten all the ingredients out for the cake and is surrounded by bowls, ingredients, utensils, etc. He is looking over the recipe. Mrs. Young enters with her clipboard, checking her schedule of things to do for dinner tonight.

MRS. YOUNG
Good morning, Manuel.

MANNY
Morning, Mrs. Young.

MRS. YOUNG
What are you working on?

MANNY
I thought I'd start on the cheesecake.

MRS. YOUNG
Great. I'm going to run out in a minute. We may be low on some things, so make sure you have enough of everything.

MANNY
Sure, Mrs. Young.

Shot of Manny reading recipe

MANNY
Okay, first I need to measure the graham cracker crumbs.
GRAPHIC SCREEN OF MEASURING CUPS, EACH A DIFFERENT COLOR AND LABELED IN AMOUNTS - 1 CUP, 1/2 CUP, 1/3 CUP, 1/4 CUP. WHEN THE STUDENT TOUCHES SCREEN THAT CUP WILL APPEAR ON NEXT SCREEN.

NARRATOR VO - 2ND AUDIO
Which cup is most appropriate for Manny to use to measure two cups of crumbs? Touch the blue dot next to the correct answer.

TEXT SCREEN:
WHICH CUP IS MOST APPROPRIATE FOR MANNY TO USE TO MEASURE TWO CUPS OF CRUMBS?
• ...1 cup
• ...1/2 cup
• ...1/3 cup
• ...1/4 cup
TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
How many times should Manny fill this cup to measure two cups? Touch the cup as many times as you need. When you're done, touch enter.

Suppose that cup was missing. Which other cup could you use to measure the two cups of crumbs?

- ...1 cup
- ...1/2 cup
- ...1/3 cup
- ...1/4 cup
How many times should you fill this cup to measure two cups? Touch the cup as many times as you need. When you’re done, touch enter.

VIDEO: Manny pouring crumbs into bowl

MANNY
And a stick of butter (unwraps and drops into bowl). ... There's the crust (moves bowl out of way)

Shot of these ingredients together in bowl and back to Manny, who is referring back to recipe.
MANNY
Next the filling.

He lays his hand on each of the "non-measure" ingredients as he checks them off mentally.

MANNY
Eggs, check. Cream cheese and the chocolate bits are already weighed out here.

Let's see - sugar, two-thirds of a cup...

---

NARRATOR VO - 2ND AUDIO
Which cup is most appropriate for Manny to use to measure two-thirds of a cup of sugar?

TEXT:
WHICH CUP IS MOST APPROPRIATE FOR MANNY TO USE TO MEASURE 2/3 CUP OF SUGAR?

- 1 cup
- 1/2 cup
- 1/3 cup
- 1/4 cup

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
How many times should Manny fill the one-third cup to measure two-thirds of a cup? Touch the cup as many times as you need. When you're done, touch enter.

Which spoon is most appropriate for Manny to use to measure 3 tablespoons of orange juice?

- ...1 TABLESPOON
- ...1 TEASPOON
- ...1/2 TEASPOON
- ...1/4 TEASPOON
How many times should Manny fill the spoon to measure three tablespoons of orange juice? Touch the spoon as many times as you need. When you're done, touch enter.

Manny

... three (as if counting). Sugar, yes. and vanilla. (peers through vanilla bottle) There's not that much here. I wonder if we've got two teaspoons
GRAPHIC SCREEN OF SPOONS: 1 TABLESPOON, 1 TEASPOON, 1/2 TEASPOON, 1/4 TEASPOON

NARRATOR VO - 2ND AUDIO
Which spoon is most appropriate for Manny to use to measure 2 teaspoons of vanilla?

TEXT:
WHICH SPOON IS MOST APPROPRIATE FOR MANNY TO USE TO MEASURE 2 TABLESPOONS OF VANILLA? TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.

- 1 TABLESPOON
- 1 TEASPOON
- 1/2 TEASPOON
- 1/4 TEASPOON
- 1/8 TEASPOON

GRAPHIC SCREEN SIMILAR TO PREVIOUS

NARRATOR VO - 2ND AUDIO
How many times should Manny fill the spoon to measure two teaspoons of vanilla? Touch the spoon as many times as you need. When you're done, touch enter.
Suppose that spoon was missing. Then, which other spoon could you use to measure the two teaspoons of vanilla?

Text Screen:
Suppose that spoon was missing. Which other spoon could you use to measure the two teaspoons of vanilla?

- 1 tablespoon
- 1 teaspoon
- 1/2 teaspoon
- 1/4 teaspoon
- 1/8
How many times should you fill this spoon to measure two teaspoons of vanilla? Touch the spoon as many times as you need. When you're done, touch enter.

Manny
Great. And now, cream.

Manny reaches for the pint of carton of cream and sticks his eyeball up to opening. He reaches for a graduated measuring glass and pours remaining cream in. The mark on the side shows that he has just over 3/4 cup.

NARRATOR VO - 1ST AUDIO
Does Manny have enough cream, three-fourths of a cup, for the cake?

TEXT SCREEN:
DOES MANNY HAVE ENOUGH CREAM, THREE-FOURTHS OF A CUP, FOR THE CAKE? TOUCH THE, BLUE DOT NEXT TO YOUR ANSWER
MANNY
[dusting off his hands] Ooo-la-la, this is going to be so good.

Mrs. Young enters from next room.

Mrs. Young, we're fine on the ingredients for the cake. And, you're right; we are nearly out of sugar and we're all out of cream. I'll do the ordering this afternoon.

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PROPS:

clipboard & pen
sugar, orange juice, graham cracker crumbs, butter, four eggs, pkg cream cheese and chocolate bits, a set of measuring cups and spoons, bowls, graduated glass cups and the recipe; springform pan if possible
Manny is finishing the lettering on a blackboard for the restaurant's window that reads "Today's Special: Crab Soup - $3.95. He approaches the counter, picks up the note, reads it, then picks up the recipe.

C.U. [recipe]

1/2 cup rice
1 cup crab meat
1 pint heavy cream
3/4 tsp Tabasco
1 quart clam juice
2 ounces Worcestershire sauce
salt and pepper
Garnish with chopped parsley

MANNY V.O. (2nd audio)
MANNY --
PLEASE QUADRUPLE (times four)
THIS RECIPE FOR TODAY'S SPECIAL. JUST GO AHEAD AND WRITE ON THE CARD. BACK SHORTLY --
MRS. Y

alternate:

MRS. YOUNG V.O. (2nd audio)
MANNY --
PLEASE QUADRUPLE (times four)
THIS RECIPE FOR TODAY'S SPECIAL. JUST GO AHEAD AND WRITE ON THE CARD. BACK SHORTLY --
MRS. Y

alternate 2:

Mrs. Young's voice with "that's times four"

MANNY [reading from recipe]
Cook rice in clam juice until soft. Add butter. Whirl in blender da da da da.....
[puts recipe down on the counter, reaches for a pen and bends over the recipe]
And Mrs. Young says to make four times this recipe.
How many cups of rice will Manny use? Remember, he's making four times the recipe. Touch the numbers on the bar to answer. When you're done, touch enter.

**TEXT SCREEN:**
HOW MANY CUPS OF RICE WILL MANNY USE? REMEMBER, HE'S MAKING FOUR TIMES THE RECIPE. TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE, TOUCH ENTER.

How many pints is that? Touch the numbers on the bar to answer. When you're done, touch enter.

**TEXT SCREEN:**
HOW MANY PINTS IS THAT? TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE, TOUCH ENTER.
How many pints of cream will Manny use? Remember, he's making four times the recipe.

Text Screen:
HOW MANY PINTS OF CREAM WILL MANNY USE? REMEMBER, HE'S MAKING FOUR TIMES THE RECIPE. TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE, TOUCH ENTER.
How many quarts is that?

**TEXT SCREEN:**
HOW MANY QUARTS IS THAT?
TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE, TOUCH ENTER.

How many teaspoons of hot sauce will Manny use?

**TEXT SCREEN:**
HOW MANY TEASPOONS OF HOT SAUCE WILL MANNY USE?
REMEMBER, HE'S MAKING FOUR TIMES THE RECIPE. TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE, TOUCH ENTER.
How many tablespoons is that?

TEXT SCREEN:
HOW MANY TABLESPOONS IS THAT?
TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE, TOUCH ENTER.
NARRATOR VO - 2ND AUDIO

How many quarts of clam juice will Manny use?

TEXT SCREEN:
How many quarts of clam juice will Manny use?
Remember, he's making four times the recipe. Touch the numbers on the bar to answer. When you're done, touch enter.

NARRATOR VO - 2ND AUDIO

How many gallons is that?

TEXT SCREEN:
How many gallons is that? Touch the numbers on the bar to answer. When you're done, touch enter.
How many ounces of steak sauce will Manny use?

Text screen:
How many ounces of steak sauce will Manny use? Remember, he's making four times the recipe. Touch the numbers on the bar to answer. When you're done, touch Enter.
How many cups is that?

TEXT SCREEN:
HOW MANY CUPS IS THAT?
TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE, TOUCH ENTER.
Manny is finishing the crab soup when Carol, the waitress, appears. Props: Recipe for chicken salad, order left by waitress for "2 chicken salads", bulletin board of recipes.

**CAROL**

Hey Manny, would you fix two orders of chicken salad to go? They're for John Stevens, he wants to take his girlfriend on a picnic.

**MANNY**

For John? Sure, thing. Tell him it'll be just a few minutes.

[gets recipe from recipe box]

"Two Chicken Salad with Pineapple." This recipe makes eight servings, eh? And I just need two.

Show the whole recipe but then zoom in on the title, showing this version of the recipe is enough to make 8 servings.

To horizontal split screen:

<table>
<thead>
<tr>
<th>Chicken Salad with Pineapple</th>
<th>8 servings</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 cups diced pineapple</td>
<td></td>
</tr>
</tbody>
</table>

What should Manny do to the recipe to make just two servings of salad?

Divide the amount of each ingredient by 4.

Divide the amount of each ingredient by 2.

Multiply the amount of each ingredient by 2.

Multiply the amount of each ingredient by 4.

Touch the BLUE DOT next to the correct answer.
NARRATOR V.O. (2nd audio)

What should Manny do to the recipe to make just two servings of salad?

(V.O. THESE RESPONSES)

Divide the amount of each ingredient by 4.
Divide the amount of each ingredient by 2.
Multiply the amounts of each ingredient by 2.
Multiply the amounts of each ingredient by 4.
Chicken Salad with Pineapple

(8 servings)

4 cups diced pineapple
8 cups chicken
2 cups bean sprouts
1 cup chopped celery
Vinaigrette dressing

MANNY V.O. (2nd audio)
Okay, then, I need to divide each of these ingredients by four.

Screen splits horizontally and recipe moves to left.
Graphic of recipe will remain for the next several questions:

How much pineapple does Manny need?

(8 servings)  (2 servings)

4 cups pineapples  2 cups
8 cups chicken  1 cup
2 cups bean sprouts  1/2 cup
1 cup celery  1/4 cup

Touch the BLUE DOT next to the correct answer.

NARRATOR V.O. (2nd audio)

How much chicken does Manny need?

How many cups of bean sprouts does Manny need?

How many cups of celery does Manny need?
Capacity Measurement: Scene CM-4

NARRATOR VO - 2ND AUDIO
Manny has been using the traditional system to measure capacity. The metric system is another measurement system you may have to work with. Answer this multiple choice question about metric capacity. Just touch the blue dot next to the correct answer.

What metric unit is about the same as a quart?

TEXT SCREEN:
WHAT METRIC UNIT IS ABOUT THE SAME AS A QUART?
• 1/2 LITER
• 1 LITER
• 2 LITERS
• 4 LITERS
TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
Determining How Much You Have Using Traditional Weight Measurement

Scene WM - 1
Character 3, B.J.
Character 7, Mr. Jack Martin
In Warehouse, in area where goods are packaged for retail sale

B.J. is standing next to a workbench which contains two scales, a small table scale which goes up to 10 ounces and a larger hanging scale which is marked up to 10 pounds. There are some barrels of bulk goods lined up near the workbench and some smaller containers of bulk goods on metal shelving nearby. Some cardboard cartons also sit on the metal shelves. B.J. is engrossed in reading something that looks like an order form. Mr. Martin walks up to B.J. He is carrying several order forms.

MR. MARTIN
Good morning, B.J. I'm really glad you got here early today. We have a lot of work to get done by this afternoon. (He sort of waves the order forms for emphasis here.)

Mr. Martin hands B.J. the first order form he is holding

MR. MARTIN
This is a telephone order that I got yesterday from the manager of our Newton store. She says she really needs to get her hands on some of that new gourmet popcorn. Her customers are buying it so fast she can't keep it in stock. Oh, she also needs some of those raisin candies. I told her we didn't have that much of either, but that I'd send her all we had.

B.J.
Oh, so you want me to weigh what we have and package it for shipment. (This is a statement to confirm understanding, not a question.)

MR. MARTIN
That's right, B.J. You're on the ball as usual. I need to check the loading dock now, but I'll be back in a few minutes.
Mr. Martin walks out.

B.J.
Okay, popcorn.

B.J. walks over to the area where the popcorn barrel (bin) is located and lifts out the clear plastic bag (liner) that contains the popcorn. She places the bag on the workbench between the scales.

IN ONE SHOT SHOULD BE ABLE TO SEE THE POPCORN BARREL, THE WORKBENCH, THE PACKAGING MATERIALS, AND THE TWO SCALES.

B.J. looks at the bag of popcorn.

CAMERA SHOT OF POPCORN FROM B.J.'S POINT OF VIEW.

B.J.
(Looking at both scales)
Hmm. I wonder which of these scales I should use to weigh all of this popcorn.

GO TO 3 PART SCREEN WITH A STILL OF EACH OF THE TWO SCALES IN TWO OF THE BLOCKS AND THE POPCORN IN THE OTHER. (These shots need to maintain the relative sizes of the scales and popcorn barrel. Possibly this screen arrangement will be different depending on the shots that worked best, but there will be stills of some sort.)

NARRATOR VO - 1ST AUDIO

Which scale should B.J. use to weigh all the popcorn for shipping?
Touch the blue dot next to the correct answer.

TEXT: WHICH SCALE SHOULD B.J. USE TO WEIGH ALL THE POPCORN FOR SHIPPING?

○ SCALE IMAGE POPCORN ○ SCALE IMAGE

TEXT: TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.

NARRATOR VO - 1ST AUDIO

B.J. decided to use the larger scale.

B.J. is standing next to the workbench and has put the last measuring scoop of popcorn onto the scale.
There, I'm done.

Go to closeup of the appropriate scale and particularly its dial. The appropriate scale is the larger one. It registers 5 pounds and 4 ounces.

Vertical split screen, with still of scale on left and text screen on right.

Narrator VO - 1st Audio
How much does the popcorn weigh? Touch the numbers on the bar to answer. The cursor will move automatically from pounds to ounces. When you're done, touch Enter.

Text:
How much does the popcorn weigh?

(Response Window) Pounds

responseData

(Response Window) Ounces

Touch the numbers on the bar to answer. The cursor will move automatically from pounds to ounces. When you're done, touch Enter.

Return to a shot of B.J. just tying off the bag in which the popcorn will be shipped. She puts it down on the workbench and enters the weight of the popcorn on the order form. (We don't actually see the entry on the form.)

She moves away from the larger scale that she has been using.

B.J.
One down, one to go.
I bet I can weigh this candy on that small scale there.

B.J. motions in the direction of the small scale pushed up against the back of the workbench.

B.J. pulls the little scale closer to the front of the workbench and sets the bulk candy container next to it. She starts to put the candy onto the scale. By the time she is about 3/5 of the way through she sees that the scale is almost up to its capacity of 10 ounces.
B.J.
I think I just lost my bet.
There's a lot more of this than
I thought there was.

The camera stays on the scale face and on B.J.'s hand
putting candy into the scale's container. When the scale
hits capacity B.J. picks up the container, dumps the candy out
into the shipping bag, and begins to repeat the process. She
puts the remaining candy in the weighing container, and this time
it does not quite reach the scale's capacity. (Actually it goes
up to 8 ounces.

GO TO CLOSEUP OF SECOND WEIGH. This should be in the center of
the screen so that next screen can be "overlayed" with little or
no movement of the image.

GO TO 3 PART SPLIT SCREEN WITH STILL OF FIRST WEIGH LEFTMOST,
SECOND WEIGH TOWARD CENTER, AND TEXT SCREEN ON RIGHT.

NARRATOR VO - 1ST AUDIO
How many ounces of candy are there
altogether?
Touch the numbers on the bar to
answer.
When you're done, touch enter.

TEXT SCREEN:
STILL IMAGE OF FIRST WEIGH
STILL IMAGE OF SECOND WEIGH
HOW MANY OUNCES OF CANDY ARE THERE ALTOGETHER?
(RESPONSE WINDOW) OUNCES

TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE,
TOUCH ENTER.

TEXT SCREEN COMES UP WHICH SHOWS STUDENTS RESPONSE TO LAST
QUESTION, WHETHER IT IS RIGHT OR WRONG.

NARRATOR VO - 2ND AUDIO
How much is that in
pounds and ounces?
Touch the numbers on the bar
to answer. The cursor will
move automatically from pounds
to ounces.
When you're done, touch Enter.
NARRATOR VO (2ND AUDIO)
To give the answer to the last problem, you needed to know how many ounces are in a pound. Knowing how the different units of measurement relate to each other is an important part of measuring. Answer the following questions about weight measurement. They are multiple choice. Just touch the blue dot next to the correct answer.

TEXT SCREEN (WITH GRAPHICS):
WEIGHT MEASUREMENT EQUIVALENTS

NARRATOR VO - 2ND AUDIO
How many ounces are there in one pound?

TEXT SCREEN:
HOW MANY OUNCES ARE THERE IN 1 POUND?

○ 32 OUNCES
○ 16 OUNCES
○ 10 OUNCES
○ 8 OUNCES

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
How many pounds are there in one ton?

TEXT SCREEN:
How many pounds are there in 1 ton?

- 100 pounds
- 1000 pounds
- 2000 pounds
- 50 pounds

Touch the blue dot next to the correct answer.

epr/4/28/88

PROP LIST FOR WM-1:
Same as for WM-2
Measuring Out a Specified Quantity Using Traditional Weight Measurement
Scene WM - 2
Character 3, B.J.
Character 7, Mr. Jack Martin
In Warehouse, in area where goods are packaged for retail sale (same as in WM - 1)

B.J. is tying off the bag in which the candy is to be shipped. Mr. Martin walks into the area with more order forms in his hand. These order forms are complete.

MR. MARTIN
I’m glad you’re so quick. Here’s another order that needs to be filled. (He hands this form to B.J. This one is for a hundred bags of each size of our special trail mix. So we need three hundred bags altogether. And we really have to get them out this afternoon.

B.J.
No problem, Mr. Martin. I’m sure I can get it done.

MR. MARTIN
I’m sure you can too. Oh, when you’re finished, come see me.

Mr. Martin walks out of the area. B.J. looks at the order form.

B.J.
Well, it says they want one hundred four ounce bags, one hundred eight ounce, and one hundred sixteen ounce. Which of these scales should I use to weigh all of these?

GO TO 2 PART SCREEN WITH A STILL OF EACH OF THE TWO SCALES IN THE SECTIONS.

NARRATOR VO - 1ST AUDIO
If she only uses one scale, which scale should B.J. use to weigh all the sizes of trail mix?
TEXT: IF SHE ONLY USES ONE SCALE, WHICH SCALE SHOULD B.J. USE TO
WEIGH ALL THE SIZES OF TRAILMIX?

STILL IMAGE  STILL IMAGE
o OF o OF LARGER
SMALLER SCALE SCALE

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.

-----------------------------------------------------------------------------------

B.J.
I think I'll use this one.
I'll start with the one pound size first.

B.J. selects the larger sized (hanging) scale.
B.J. puts an amount of trail mix on the scale and then looks at
the dial. (The dial should register 12 ounces)

GO TO CLOSEUP OF SCALE.

VERTICAL SPLIT SCREEN WITH STILL OF SCALE ON LEFT AND TEXT SCREEN
ON RIGHT.

NARRATOR VO - 1ST AUDIO
How many more ounces of trail
mix does B.J. need to equal one
pound?

TEXT:

STILL IMAGE OF
LARGER SCALE
REGISTERING 12
OUNCES

HOW MANY MORE OUNCES OF TRAIL MIX
DOES B.J. NEED TO EQUAL ONE POUND?

(RESPONSE WINDOW HERE)

TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE,
TOUCH ENTER.

-----------------------------------------------------------------------------------

B.J. adds some more trail mix (4 ounces to be precise) to the
scale container a little bit at a time.

GO TO CLOSEUP OF SCALE.
Should B.J. add any more trail mix? Touch the blue dot next to your answer.

B.J. is standing by the workbench with extra who is in process of removing the scale from its hanger.
Most of the one pound bags have been weighed and put into shipping cartons which have been sealed; none of the medium or small have yet been weighed.

B.J. has conversation with extra here.
Extra needs it for a special job for Mr. Martin.

MIDRANGE SHOT OF B.J. AND SMALLER SCALE (which has a maximum capacity of only 10 ounces).

B.J.'s finger points toward the dial as she inspects it.

B.J.
It's going to be harder to measure these one pound bags on this smaller scale. This scale only goes up to 10 ounces. (She says this in a complaining voice, not a surprised voice.)

Because B.J. must use the smaller scale, she'll need to measure each pound in two parts.
Which of these combinations could B.J. use to weigh one pound on this 10 ounce scale?

- 5 OUNCES AND 8 OUNCES
- 8 OUNCES AND 7 OUNCES
- 11 OUNCES AND 5 OUNCES
- 10 OUNCES AND 6 OUNCES

Touch the blue dot next to the correct answer.

Give a different combination that B.J. could use to weigh one pound on this 10 ounce scale. Touch the numbers on the bar to answer. The cursor will move automatically. When you're done, touch Enter.

B.J. is standing by the workbench and weighing out the last of the bags (the small size to indicate that she has finished the large and medium ones and is about to finish the job.) There are cardboard boxes full of the trail mix that have been placed on a large flatbed cart.

B.J. puts the last of the boxes on the cart. She picks up the order form and lays it on the cart on top of the boxes. She puts her hands on the handle.

Extra walks in carrying the scale that she borrowed.
EXTRA

Thanks. How's it going?....

........

B.J.

I'm done. I just have to take these to the loading dock and then go see Mr. Martin.

B.J. starts to push the cart out of the area.

NARRATOR VO - 2ND AUDIO

B.J. has been using the traditional system to measure weight in pounds and ounces. The metric system is another measurement system that you may have to work with. Answer this multiple choice question about metric weight. Just touch the blue dot next to the correct answer.

TEXT SCREEN (WITH GRAPHICS):
WEIGHT MEASUREMENT IN THE METRIC SYSTEM

NARRATOR VO - 2ND AUDIO

About how many pounds is equal to one kilogram?

TEXT SCREEN:
ABOUT HOW MANY POUNDS IS EQUAL TO 1 KILOGRAM?

1 pound
2 pounds
5 pounds
10 pounds

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.

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epr/4/26/88

PROP LIST FOR WM - 2:
Workbench
2 scales - 10 ounce capacity
10 pound capacity
Cartons 5 bulk food barrels
Metal Shelving
Order forms - blank
Order form - with candy and popcorn entered, but without weights or cost
Order form - for 100 4 oz, 100 8 oz, and 100 1 lb bags of trailmix, completed
Loose Popcorn
Loose coated raisin candy
Pen
Pencil
Clear bags of various sizes
Twist or tape ties
Labels for bags of trailmix
Trailmix
Metal scoop(s)
Tom and Mr. Richmond are standing in the center of the room. Tom is wearing painter's overalls and a painter's hat. Also present in the room are 2 buckets of paint (1 interior, 1 exterior) and various painting supplies including a drop cloth, spread on the floor, and a step ladder.

MR. RICHMOND
Get started as soon as possible. I'd really like to finish painting this room this morning, so we can start painting outside this afternoon. I have to go over to the other job now. Be back in a couple of hours.

TOM
Okay. See you later, Mr. Richmond.

Tom turns the paint can around to read the directions.

TOM
Oh, look at this. (Points to label and reads.) "Do not use at temperatures below 50 degrees or above 90 degrees fahrenheit." Hmm... I wonder what the temperature is in here.

Tom walks out of the room to look at thermostat in next room.

GO TO CLOSEUP OF THE THERMOSTAT which reads 73 F.

HORIZONTAL SPLIT SCREEN WITH THERMOSTAT (OR GRAPHIC OF IT) ON TOP AND TEXT SCREEN ON BOTTOM.

NARRATOR VO - 1ST AUDIO?
What is the temperature in the house where Tom is working? Touch the numbers on the bar to answer. When you're done, touch Enter.

IMAGE OF THERMOSTAT DIAL (PROBABLY STILL, BUT POSSIBLY GRAPHIC)
WHAT IS THE TEMPERATURE IN THE HOUSE WHERE TOM IS WORKING?

(TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE, TOUCH ENTER.)

Well, the temperature's okay. I'll get started right away.

Tom walks over to the ladder where the portable radio is sitting.

Let's get some tunes. (As he pushes a button on the radio)

(Music playing) It's going to be a hot one today, folks. If you think it's hot now, brace yourselves. By noon, it's going to be at least 10 degrees hotter.

Music starts to play again more quietly.

I'd better check the outdoor paint too.

Tom picks up the can of exterior paint and turns it around to read the directions.

I can't paint with this when it's over 90 degrees either. I'll check that thermometer outside.

Tom walks to sliding glass door to look out at glass tube thermometer which is mounted on outside of doorframe. The thermometer reads 77 degrees F.

What is the temperature outside now?
TEXT:
WHAT IS THE TEMPERATURE OUTSIDE NOW?

STILL IMAGE OF GLASS TUBE THERMOMETER

(RESPONSE WINDOW HERE)

TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE, TOUCH ENTER.

FOLLOWING STUDENT RESPONSE, THE SAME SPLIT SCREEN STAYS, ALONG WITH THE STUDENT'S ANSWER, BUT DIRECTIONS ARE CHANGED AS FOLLOWS.

NARRATOR VO (1ST AUDIO)
Is this the answer you want. Touch the blue dot next to your answer.

TEXT:
WHAT IS THE TEMPERATURE OUTSIDE NOW?

STILL OF GLASS TUBE THERMOMETER

(STUDENT RESPONSE)

IS THIS THE ANSWER YOU WANT?

○ YES ○ NO

TOUCH THE BLUE DOT NEXT TO YOUR ANSWER.

NARRATOR VO - 2ND AUDIO
What will the temperature be if it goes up ten degrees?

TEXT SCREEN:
WHAT WILL THE TEMPERATURE BE IF IT GOES UP 10 DEGREES?

REMEMBER, YOU SAID THAT IT WAS ALREADY (STUDENT RESPONSE) DEGREES OUTSIDE.

(RESPONSE WINDOW HERE)

TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE, TOUCH ENTER.
Will Tom be able to continue painting if the temperature goes up ten degrees?

- Yes
- No

Touch the blue dot next to your answer.

TOM

Well, it'll be cutting it close, but I'll probably be able to paint outside when I'm done in here.

Tom has been working with thermometers that measure temperature in "degrees Fahrenheit". Other thermometers are sometimes used that measure temperature in "degrees Celsius." Answer the following questions about these two temperature scales. They are multiple choice. Just touch the blue dot next to the correct answer.

Temperature can be measured in degrees Fahrenheit or in degrees Celsius.

SOME SORT OF GRAPHIC OF THERMOMETER OR SOMETHING HERE TOO.

NARRATOR VO - 2ND AUDIO

At what temperature does water freeze?
AT WHAT TEMPERATURE DOES WATER FREEZE?

- 0 FAHRENHEIT
- 32 CELSIUS
- 32 FAHRENHEIT
- 212 FAHRENHEIT

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.

NARRATOR VO - 2ND AUDIO
What Celsius temperature is the same as thirty-two degrees Fahrenheit?

WHAT CELSIUS TEMPERATURE IS THE SAME AS 32 DEGREES FAHRENHEIT?

- 0 CELSIUS
- 32 CELSIUS
- 100 CELSIUS
- 212 CELSIUS

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.

NARRATOR VO - 2ND AUDIO
What Celsius temperature is the same as 212 degrees Fahrenheit?

WHAT CELSIUS TEMPERATURE IS THE SAME AS 212 DEGREES FAHRENHEIT?

- 0 CELSIUS
- 100 CELSIUS
- 32 CELSIUS
- 212 CELSIUS

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.

NARRATOR VO - 2ND AUDIO
What happens at one hundred degrees Celsius?
WHAT HAPPENS AT 100 DEGREES CELSIUS?

- WATER FREEZES
- WATER BOILS
- PEOPLE GO SWIMMING
- PEOPLE GO ICESKATING

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
Telling Time
Scene TM-1
Character 2, Manny
C6, Mrs. Young
Kitchen

Manny is washing bowls and utensils at the sink when Mrs. Young rushes in. She’s carrying a brown paper sack, from which she takes a bottle of vanilla and puts it up in the cupboard. Manny is wearing an analog watch. Mrs. Young and Manny have a fast-paced dialogue.

MRS. YOUNG
[indicating vanilla]
This vanilla should hold us over for today.

MANNY
[confirmatory tone] Oh, great.

(Mrs. Young tries to check her watch but notices she’s forgotten to put it on.)

Oh, shoot! I forgot my watch. And today of all days when I’ve got appointments all over town. What time is it?

MANNY
Not to worry, Mrs. Young, I’ve got my watch on.

Close-up on Manny’s arm, showing his analog watch, and then zooming in on the face of the watch, which indicates the time is 10:35. Close-up retreats to top half of vertical split screen and text appears on the bottom of the screen:
What time is it?

7:50
10:07
10:25
10:36

Touch the BLUE DOT next to the correct answer.

NARRATOR V.O. (2nd audio)
What time is it?
Touch the BLUE DOT next to the correct answer.
Telling Time
Scene TM-2
Character 2, Manny
Kitchen

Manny returns from running an errand. He takes his jacket off and notices a note for him on the refrigerator.
We need a digital clock radio that blinks 12:00 when plugged in, his analog watch from the previous scene. A note (text below) is magneted to the refrigerator.

MANNY
[reading aloud]
Manny --
Our new mixer is arriving this afternoon. Please clear a space for it. See you soon.
Mrs. Young

Manny looks around and spots the space where the radio is. He unplugs the radio and looks around for a place for it. He spots a window sill (or someplace equally convenient), and plugs it back in.

MANNY
This looks like the best place for it.

Close-up of clock blinking "12:00" when he plugs it back in.

MANNY
Let's see now.

[He glances at his watch.]

Screen:

For what time should Manny set the clock?

Touch the NUMBERS ON THE BAR to answer. When you're done, touch ENTER.
Close-up of analog watch showing the time is 11:10. Close-up retreats to top half of screen. Video of clock radio on the bottom half has place for student to enter answer in (can be graphic if there is a problem doing this).

NARRATOR V.O. (2nd audio)
For what time should Manny set the clock? Touch the ENTER button on the clock. When you're done, touch ENTER.

Each touch will change the number in a box.

Note: seems like student should ALWAYS touch enter to move from hours to minutes, since only if above 10 hours it moves automatically? what thinkest thou?

For what time should Manny set the clock?

Touch the boxes on the clock to set the time. Each touch will change the number in a box. When you're done, touch enter.
Mrs. Young and Manny are working. Mrs. Young, wiping her hands on a dishtowel, approaches Manny. Props include a piece of paper (perhaps on a pad), and a pencil.

MRS. YOUNG
Manny, I want you to make some of your fruit salad for today’s buffet? We’ve had a lot of compliments on it.

MANNY
Do you want me to make the cakes, too, Mrs. Young?

MRS. YOUNG
Well, yes, Manny. We have to have your cakes.

MANNY
(He reaches for a pencil and scrap of paper to use to figure his time.)
Let me just figure out how long it will take to make both.

It’s thirty-five minutes for the fruit salad, with all the peeling and slicing and stuff. And, the cake takes thirty minutes to mix, fifty-five minutes to bake, thirty to cool and about ten to frost. Let’s see.

Screen:
Graphic of the numbers he’s jotted down on left half of vertical split screen:

```
35
30
55
30
10
------
```
How much time, in minutes, will it take Manny to make the salad and cakes? Work this problem.

Screen:
Student’s response (_____ minutes) moves from the right of the screen to the left.

Text screen:

How much time in HOURS AND MINUTES will it take Manny to make the salad and cakes?

_____ minutes  _____ hours _____ minutes

Touch the NUMBERS ON THE BAR to answer. The cursor will move automatically from hours to minutes. When you’re done, touch ENTER.
Scheduling Time
Scene TM-4
Character 2, Manny
C6, Mrs. Young
Location: Kitchen

Shot of Manny, standing peeling apples. A bowl of peeled apples is on one side and a bowl of unpeeled apples on the other.

Mrs. Young approaches.

MRS. YOUNG
I hate to rush you, Manny, but when will you be done? I've got some other things for you to do.

Manny glances at his watch.

MANNY
I'm about half-way done now, Mrs. Young and it's taken me twenty minutes.

Text screen:

How many minutes will it take Manny to peel all the fruit? Remember, peeling half the fruit has taken 20 minutes.

[ ] minutes

Touch the NUMBERS ON THE BAR to answer. When you're done, touch ENTER.

NARRATOR V.O. (2nd audio)
How many minutes will it take Manny to peel all the fruit? Remember, peeling half the fruit has taken twenty minutes.
Manny is at work making mini-pizzas. In front of him is a cutting board, a knife and a jar of olives. Some doughy-looking substance and some tomato-sauce looking substance, perhaps some other, assorted toppings, should be visible.

MANNY
I'm making some terrific little pizzas for appetizers, Mrs. Young, five different kinds.

MRS. YOUNG
Do you have time, Manny, to make so many kinds?

MANNY
Oh, sure. Each topping takes only about ten minutes to make. I'm just finishing the first one now, olive. They'll be great!!

Full text screen:

How many minutes will it take Manny to make all 5 kinds of pizza? Remember, each kind takes 10 minutes.

[ ] minutes

Touch the NUMBERS ON THE BAR to answer. When you're done, touch ENTER.

NARRATOR V.O. (2nd audio)
How many minutes will it take Manny to make all five kinds of pizza?
Remember, each kind takes ten minutes.
Mrs. Young and Manny are working in the kitchen. Manny is stirring a pot on the stove, tastes his creation, and shares his enjoyment with Mrs. Young.

MANNY
[to himself] Mmmmm. It's done. Mrs. Y, try this new stew I made. [hands her a spoon and she tastes it.]

MRS. YOUNG
Manuel, you are a genius!

MANNY
I'm going to call it "Fiesta de Manuel." [smiles, pleased with himself. And I remembered to keep track of my time, to figure out how long it takes to make. I started at eleven-fifty and now it's [glances at watch] 1:20.

How long did it take Manny to make the soup?

_____ hours and _____ minutes

Touch the NUMBERS ON THE BAR to answer. The cursor will move automatically from hours to minutes. When you're done, touch ENTER.

NARRATOR V.O. (2nd audio)
How long did it take Manny to make the soup? Touch the NUMBERS ON THE BAR to answer. The cursor will move automatically from hours to minutes. When you're done, touch ENTER.
Elapsed Time
Scene TM-7
Character 2, Manny
C6, Mrs. Young
Location: Kitchen

There's a pot of soup on the stove and Manny is at the sink, washing bowls and utensils. Mrs. Young is checking on what's in the oven. She closes the oven door and pushes back her hair with her forearm, picks up a tray, wipes it off with her hand, puts the tray down on the counter, and in the process of doing so, knocks a kitchen timer onto the floor.

MRS. YOUNG
[to herself, at first]
Darn, another timer. That's my third.
[pauses, then shakes her head, deciding that she can't do anything about it now]
I've got to run. [raises her voice]
Manny, I put this roast in at ten-thirty and it needed to cook for three hours and fifteen minutes. Will you take it out when it's time? I've got to get out of here.
[She heads toward the door.]

MANNY
Sure Mrs. Young. See you later.

[Exit Mrs. Young.]

MANNY
[to himself]
But the timer's broken --oh, I know, I'll set the alarm on the radio.

Ten thirty plus three hours and fifteen minutes.
Mrs. Young put the roast in at 10:30.
It needs 3 hours and 15 minutes to cook.
What does Manny need to do to find out what time the roast will finish?

10:30 + 10:30 + 10:30
+ 3:15 - 3:15 + 3:15 - 3:15

10:30

Touch the BLUE DOT next to the correct answer.

NARRATOR V.O. (2nd audio)

Remember, Mrs. Young put the roast in at ten thirty. It needs three hours and fifteen minutes to cook. What does Manny need to do to find out what time the roast will finish?
Suppose Manny put a ham in the oven at 2:30 and it needed to cook for 2 hours and 45 minutes. At what time would the ham be done?

2:30 + 1:30 + 1:50 +
2:45 1:45 1:75

Touch the numbers on the bar to answer. When you're done, touch enter.

At what time would the ham be done?

Touch the boxes on the clock radio to set the time. Check that you have the correct time.
Mrs. Young and Manny are working together in the kitchen. Mrs. Young, holding a recipe for a marinated dish in one hand, approaches Manny.

MRS. YOUNG
Schedule this [hands it to him] so that Sam can take it out of the oven at eight o’clock promptly, Manny. Tonight is the Rosenberg’s anniversary, and this is one of their favorites.

MANNY
Sure, Mrs. Young. [takes recipe and Mrs. Young exits] Oh, it’s one of these fancy marinated dishes.

Shot of Manny holding the recipe, reading from it.

MANNY
Let’s see, it’s three hours marinating and two hours cooking.

Text screen (on top)

**At** What time should Manny begin marinating the dish? Remember, it takes 3 hours to marinate, 2 hours to cook, and it must be done at 8:00 pm. What time should Manny begin marinating the dish?

Touch the NUMBERS ON THE BAR to answer. When you’re done, touch ENTER.

NARRATOR V.O. (2nd audio)
**At** What time should Manny begin marinating the dish?
Money Values: Reading Money Values, Counting Money, and Money Equivalencies

Scene MV-1
Character 4, Nikki
Character 8, customer, Ms. Jesse Houston
Small gallery/frame shop

Ms. Houston and Nikki at counter (same as in LM - has a metal yardstick attached along edge, a 12-inch ruler, a metal tape measure, a yardstick, an order pad, a sales pad, stickers for writing prices, various pens and pencils, roll of double-sided tape, spool of wire, and a cash box). Measured wire (from LMT) laying on counter - coiled with hand-written price tag on it. Nikki is putting a price tag on the coiled tape.

NIKKI
All right. (lays tape down next to wire) Is there anything else, Ms. Houston?

MS. HOUSTON
(pushes package of eye screws, hanger, and box of hooks toward Nikki and the two measured items)
This should be everything I need, Nikki.

Nikki picks up sales pad and pen; looks at items as speaks

NIKKI
O-o-kay. (first syllable stretched just a little)

Nikki touches first item - tape, 40¢

CU OF PRICE TAG TO STILL
NARRATOR VO - 2ND AUDIO
Which answer means the same thing as the price tag? Touch the blue dot next to the correct answer.

TEXT:
WHICH ANSWER MEANS THE SAME THING AS THE PRICE TAG?
• FOUR CENTS
• FORTY DOLLARS
• FORTY CENTS
• FOUR DOLLARS
TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
SAME SCREEN ARRANGEMENT; GRAPHIC ITEM CHANGES TO EYE SCREWS WITH PRICE TAG - 75¢

NARRATOR VO 2ND AUDIO
Which answer means the same thing as the price tag?

TEXT:
WHICH ANSWER MEANS THE SAME THING AS THE PRICE TAG?
• $ .75
• $ 75.00
• $ 7.50
• $ .57
TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
SAME SCREEN ARRANGEMENT; GRAPHIC ITEM CHANGES TO BOX OF HOOKS WITH PRICE TAG - $2.35

NARRATOR VO - 2ND AUDIO
Which answer means the same thing as the price tag?

TEXT:
WHICH ANSWER MEANS THE SAME THING AS THE PRICE TAG?
○ TWENTY-FIVE CENTS
○ FIVE DOLLARS AND TWENTY-THREE CENTS
○ TWO HUNDRED AND THIRTY-FIVE DOLLARS
○ TWO DOLLARS AND THIRTY-FIVE CENTS

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.

VIDEO: Items and all five prices are written in on sales pad. Nikki is writing in total.

NIKKI
That's five dollars and eighty-eight cents. (tears off receipt and lays on counter)

Nikki starts bagging items as customer checks money
MS. HOUSTON
I have so much change, Nikki.
Okay if I use it?

NIKKI
Sure.

Customer counts coins inside purse or wallet and puts on counter as one mass - 2 ones, 9 quarters, 12 dimes, 6 nickels, 13 pennies

MS. HOUSTON
I think this is right, Nikki.

CU ON MONEY - MAYBE TO STILL

NARRATOR VO - 1st Audio
You need to find out if Ms. Houston gave Nikki enough money.

GRAPHIC OF RANDOM ARRANGEMENT OF COINS AT TOP, TEXT IN MIDDLE, AND CHOICES AT BOTTOM

NARRATOR VO - 2nd Audio
There are nine quarters. How much money is that?

TEXT:
THERE ARE 9 QUARTERS. HOW MUCH MONEY IS THAT?
• $ .75
• $ 1.75
• $ 2.25
• $ 3.50

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
There are 9 quarters. How much money is that?

- $0.75
- $1.75
- $2.25
- $3.50

Touch the BLUE DOT next to the correct answer.

---

NARRATOR VO - 2ND AUDIO

There are twelve dimes. How much money is that?

TEXT:

THERE ARE 12 DIMES. HOW MUCH MONEY IS THAT?

- $1.12
- $1.20
- $2.12
- $3.00

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
There are six nickels. How much money is that?

**TEXT:**

**THERE ARE 6 NICKELS. HOW MUCH MONEY IS THAT?**
- $ .06
- $ .30
- $ .60
- $ 1.30

**TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.**

**VIDEO:** CU STILL see Nikki’s hand with pencil and paper on which she’s written each amount and a line

$ 2.00
$ 2.25
$ 1.20
$ .30
$ .13

**OVERLAY QUESTION AND KEYPAD**

**NARRATOR VO 1st**

How much money did Ms. Houston give Nikki? Touch the numbers on the bar to answer. When you're done, touch enter.
How much money did Ms. Houston give Nikki? Touch the numbers on the bar to answer. When you're done, touch ENTER.

How much money did Ms. Houston give Nikki?

Touch the numbers on the bar to answer. When you're done, touch ENTER.

Did Ms. Houston give Nikki enough money?

Did Ms. Houston give Nikki enough money? Remember, you said Ms. Houston gave Nikki ________

- YES
- NO

Touch the blue dot next to the correct answer.
VIDEO: Nikki is putting last of coins into cash box; closes box; picks up bag

NIKKI
Thanks, Ms. Houston. (hands bag to customer) We'll see you when your pictures are ready.

FADE

PROPS: add to LM-1&2

woman's wallet or coin purse with at least:
  2 one dollar bills
  9 quarters
  12 dimes
  6 nickels
  13 pennies

store bag for putting items into
Money Values: Making Change and Money Equivalencies
Scene MV-2
Character 4, Nikki
Character 9, customer, Mr. Colby
Small gallery/frame shop

Nikki is working on something at counter (same as in LM - has a metal yardstick attached along edge, a 12-inch ruler, a metal tape measure, a yardstick, an order pad, a sales pad, stickers for writing prices, various pens and pencils, roll of double-sided tape, spool of wire, and a cash box). Mr. Colby enters in rush and seems preoccupied (he must have wallet in pocket).

NIKKI
(looks up) Hi, Mr. Colby. Are you ready for the big art show?

MR. COLBY
(heading toward display rack with packaged items) Almost, Nikki, but I have a million last minute things to do! (picks up package and waves toward Nikki) I ran out of picture hangers.

Mr. Colby walks to counter and lays package down. Nikki writes up sales receipt as Mr. Colby gets out $1 bill and lays it on counter.

NIKKI
Forty-seven cents, Mr. Colby. (picks up dollar bill) out of one dollar. (opens cash box)
How much change should Nikki give Mr. Colby?

How much change should Nikki give Mr. Colby? Touch the numbers on the bar to answer. When you're done, touch ENTER.
NARRATOR VO - 2ND AUDIO

What are the fewest pieces of money Nikki should use to make the change? Touch the pieces of money you want to use. You can use a piece of money more than once, if you need to. When you're done, touch enter.

NARRATOR VO

Nikki wants to use the fewest coins possible. Which coins should she use to make fifty-three cents in change? Touch the pieces of money you want to use. You can use a piece of money more than once. When you're done, touch enter.

TEXT:

NIKKI WANTS TO USE THE FEWEST COINS POSSIBLE. WHICH COINS SHOULD SHE USE TO MAKE 53¢ IN CHANGE? TOUCH THE PIECES OF MONEY YOU WANT TO USE. YOU CAN USE A PIECE OF MONEY MORE THAN ONCE. WHEN YOU'RE DONE, TOUCH ENTER.

What are the fewest pieces of money Nikki should use to make the change?

Touch the pieces of money you want to use. You can use a piece of money more than once if you need to. When you're done, touch ENTER.

new question

VIDEO: Nikki closing cash box and Mr. Colby pocketing change and looking preoccupied.

NARRATOR VO - 2ND AUDIO

Suppose Nikki had no quarters. Then, which coins should she use to make fifty-three cents in change? Touch the pieces of money you want to use.
NIKKI
Thanks, Mr. Colby. I hope... (Mr. Colby cuts in; is shaking head slightly - side to side)

MR. COLBY
You know, I'm just not thinking clearly today. I always need hangers, and I might as well get a few more while I'm here. (heads toward rack) Sorry, Nikki, but will you figure up (pause) eight more?

NIKKI
(starts writing receipt) No problem, Mr. Colby.

Mr. Colby returns to counter and puts eight hanger packages on it, then starts to get out wallet

NIKKI
(finishes receipt) Okay, it's three dollars and seventy-eight cents.

MR. COLBY
Oh, you're gonna love this! I only have a twenty. (puts $20 bill on counter)

TO STILL
NARRATOR VO - 2ND AUDIO
When Nikki counts out Mr. Colby's change, as she hands it to him, what piece of money should she give him first? Touch the correct piece of money.

TEXT:
When Nikki counts out Mr. Colby's change, as she hands it to him, what piece of money should she give him first? Touch the correct piece of money.
(penny) ✓
(dime)
(one dollar bill)
(five dollar bill)
NARRATOR VO - 2ND AUDIO

What are the fewest pieces of money Nikki should use to make the change? Touch the pieces of money you want to use. When you're done, touch enter.

NIKKI WANTS TO USE THE FEWEST PIECES OF MONEY POSSIBLE. WHAT SHOULD SHE USE TO MAKE $16.22 IN CHANGE? TOUCH THE PIECES OF MONEY YOU WANT TO USE. YOU CAN USE A PIECE OF MONEY MORE THAN ONCE. WHEN YOU'RE DONE, TOUCH ENTER.

VIDEO: Cash box closed; change on counter; Nikki putting packages in small bag.

MR. COLBY

Nikki, I hate to make you work so hard, but I need change for the parking meter. (takes one $1 bill out of wallet, puts it on second
$1 bill from change on counter, and pushes them toward Nikki. Just give me some quarters and dimes?

Nikki picks up the two ones, puts them by cash box, then opens box.

NIKKI
Sure, Mr. Colby, I got a lot of change from my last customer.

TO STILL

GRAPHIC/TEXT SCREEN: DOLLAR BILL AT TOP, QUESTION UNDERNEATH, THEN DIRECTIONS, AND KEYPAD ON BOTTOM

NARRATOR VO - 2ND AUDIO
In order to exchange money for an equal value, you need to know how many of one coin are the same as a different coin or bill. Answer the following questions about money equivalents. They are multiple choice questions. Just touch the blue dot next to the correct answer.

NARRATOR VO - 2ND AUDIO
How many dimes equal one dollar?

TEXT:

MV-16 16
HOW MANY DIMES ARE EQUAL TO ONE DOLLAR?
- 10
- 20
- 50
- 100
TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.

GRAPHIC/TEXT SCREEN: DOLLAR BILL AT TOP, QUESTION UNDERNEATH, THEN DIRECTIONS, AND KEYPAD ON BOTTOM

NARRATOR VO - 2ND AUDIO
How many quarters are equal to one dollar?

TEXT:
HOW MANY QUARTERS ARE EQUAL TO ONE DOLLAR?
- 1
- 2
- 4
- 5
TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
How many quarters are equal to $1.00?

- 1
- 2
- 4
- 5

Touch the BLUE DOT next to the correct answer.

NARRATOR VO - 2ND AUDIO
How many nickels are equal to $1.00?

TEXT:
HOW MANY NICKELS ARE EQUAL TO ONE DOLLAR?
- 10
- 20
- 50
- 100

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.

How many nickels are equal to $1.00?

- 10
- 20
- 50
- 100

Touch the BLUE DOT next to the correct answer.
NARRATOR VO - 2ND AUDIO
How many one dollar bills are equal to five dollars?

TEXT:
HOW MANY ONE DOLLAR BILLS ARE EQUAL TO FIVE DOLLARS?
• 1  
• 2  
• 4  
• 5  
TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.

NARRATOR VO - 2ND AUDIO
How many five dollar bills are equal to twenty dollars?

TEXT:
HOW MANY FIVE DOLLAR BILLS ARE EQUAL TO TWENTY DOLLARS?
• 1  
• 2  
• 4  
• 5  
TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
PROPS: add to LM-1&2 and MV-1

twenty dollar bill
2 one dollar bills
10 packages picture hangers
Your Earnings on the Job
Scene ME-1
Character 3, B.J.
Character 7, Mr. Martin
Warehouse

VIDEO - An aisle of the warehouse. Mr. Martin is talking to another worker. He is carrying a clipboard, which he hands to the worker when he departs. B.J. catches up with him.

B.J.
(hesitantly) Mr. Martin? You said you wanted to see me?

MR. MARTIN
Yes, B.J. (slight pause) B.J., you do very good work, really, and I've decided you deserve a raise. How does five dollars an hour sound?

B.J.
Wow, that's terrific, Mr. Martin. Thanks very much.

MR. MARTIN
(looking at watch) Well, you'd better get back to work and earn it. I'll see you later. (exits)

B.J.
Five dollars an hour. I wonder how much I'll make if I work forty hours a week? (exits)
corrected NARRATOR VO

What should B.J. do to find out how much she will earn each week? Remember, she works five days a week, eight hours a day, for a total of forty hours a week. She earns five dollars an hour. Touch the blue dot next to the correct answer.

TEXT SCREEN:
WHAT SHOULD B.J. DO TO FIND OUT HOW MUCH SHE WILL EARN EACH WEEK?

REMEMBER, SHE WORKS 5 DAYS A WEEK, 8 HOURS A DAY, FOR A TOTAL OF 40 HOURS A WEEK. SHE EARN $5.00 AN HOUR.

- ...MULTIPLY $5.00 X 4.0
- ...MULTIPLY $5.00 X 5.0
- ...MULTIPLY $5.00 X 40.0
- ...MULTIPLY $5.00 X 100.0
TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
NARRATOR VO - 2ND AUDIO
Work out the answer to this problem to find out how much B.J. will earn in a week. Touch the numbers on the bar to answer. When you're done, touch enter.
VIDEO - Mr. Martin catches up with B.J. in the aisle and stops her to ask a question. He is carrying a clipboard.

MR. MARTIN

B.J., we're scheduled to receive a huge shipment of pasta tonight and another tomorrow. We've gotta get the first one packaged and shipped-out on the double. Can you work overtime?

B.J.

Sure, Mr. Martin. I'm glad to.

MR. MARTIN

Great, I'll put you on the schedule. (makes a note to himself on clipboard) I appreciate this on such short notice, B.J., That'll be two hours of overtime, at a rate of time-and-a-half. (exits)

B.J.

First a raise and now overtime! (exits)
NARRATOR VO - 2ND AUDIO

What does B.J. need to do to find out her hourly overtime pay rate? Remember, the hourly overtime rate is “time-and-a-half.”

TEXT SCREEN:

WHAT DOES B.J. NEED TO DO TO FIND OUT HER HOURLY OVERTIME PAY RATE?


- ...MULTIPLY $5.00 X 0.5
- ...MULTIPLY $5.00 X 1.5
- ...MULTIPLY $5.00 X 2.0
- ...MULTIPLY $5.00 X 8.0

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
Work out the answer to this problem to find out B.J.'s hourly overtime pay rate.
Your Earnings on the Job
Scene ME-3
Character 3, B.J.
Character 7, Mr. Martin
Warehouse

VIDEO - Mr. Martin arrives in a hurry, looking harassed. B.J. is working on something.

MR. MARTIN
B.J., we are really pressed to get these out by six o’clock tonight. You’ll get a ten percent bonus on today’s wages if we make it.

(he hurries on)

B.J.
Yes, sir! (continues to work, talking to herself)
More money! This is wild. My base pay, eight hours at five dollars per hour, is forty dollars. My overtime pay, two hours at seven dollars and fifty cents per hour, is fifteen dollars. (looks up, doing mental calculations) Together, that makes fifty-five dollars. Plus ten percent for the bonus!
NARRATOR VO - 2ND AUDIO
What is ten percent of fifty-five dollars?

TEXT SCREEN:
WHAT IS 10% OF $55.00?

TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE, TOUCH ENTER.
Your Earnings on the Job
Scene ME-4
Character 3, B.J.
Character 7, Mr. Martin
Warehouse

VIDEO - B.J. has packed the last of the pasta and is putting on her jacket and picking up her purse to leave. In her purse is an old paystub. Mr. Martin walks by and says thanks/good-night.

MR. MARTIN
(looking tired) Thanks a lot, B.J. We couldn't have done it without you.

B.J.
Thank you, Mr. Martin. What a day! A raise, overtime, and a bonus! My friends aren't going to believe this! I can't wait to tell Nikki!

MR. MARTIN
You did have a day, didn't you? Excellent. But, you know, the more you make, the more they take...in deductions, that is

B.J.
(looking confused and shaking her head)
Deductions? I never understood how all that worked.

MR. MARTIN
You figured out gross pay by figuring out what goes into your paycheck, right? Your base pay, your overtime, your bonus.

B.J. nods "Mm hmm" in agreement

MR. MARTIN
Well, deductions are what come out of your check before you even see it -- your health insurance, Social Security, federal and state taxes -- that sort of stuff. When you subtract deductions from
gross pay, what's left is net pay. That's what goes in your pocket.

B.J.
(searching for pay stub in her purse) Yeah, I thought it was something like that. (finds the pay stub) Ah, here. I thought I had one.
(holding pay stub out toward Mr. Martin) Here's one of my old pay stubs. Will you show me on here, Mr. Martin? I really do want to understand this.

MR. MARTIN
Sure, B.J., happy to. Let's see it.

CU upper part of pay stub, focusing on deductions row

These are your deductions here (traces with finger) insurance, five dollars and charity, one dollar. Now, if you were part of a union, you could have your dues deducted. You always sign-up for these voluntary deductions. Now, Federal, FICA - that's Social Security, and state taxes. Those are automatic deductions. They have to be taken out. What have we got all together?

GRAPHIC/TEXT SCREEN: PAY STUB.

NARRATOR V9 - 2ND AUDIO
How many deductions are there for the current pay period?

TEXT SCREEN:
HOW MANY DEDUCTIONS ARE THERE FOR THE CURRENT PAY PERIOD?

TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE TOUCH ENTER.
What are the five deductions for the current pay period? Touch the numbers on the paystub that are deductions. When you're done, touch enter.

Text screen:
What are the 5 deductions for the current pay period?

Touch the numbers on the paystub that are deductions.

What is the total amount of these deductions?
TEXT SCREEN:
WHAT IS THE TOTAL AMOUNT OF THESE DEDUCTIONS?

TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE, TOUCH ENTER.

GRAPHIC/TEXT SCREEN: PAY STUB.

NARRATOR VO - 2ND AUDIO
What is the gross pay for the current pay period? Touch the number on the paystub.

TEXT SCREEN:
WHAT IS THE GROSS PAY FOR THE CURRENT PAY PERIOD?

TOUCH THE NUMBER ON THE PAYSTUB.
NARRATOR VO - 2ND AUDIO
What does B.J. need to do to find out her net pay?

TEXT SCREEN:
WHAT DOES B.J. NEED TO DO TO FIND OUT HER NET PAY?

REMEMBER, YOU SAID THE TOTAL OF HER DEDUCTIONS WAS \( \_ \_ \_ \_ \_ \_ \) AND HER GROSS PAY WAS \( \_ \_ \_ \_ \_ \_ \)

• ADD \( \text{answer 1} + \text{answer 2} \)
• SUBTRACT \( \text{answer 1} - \text{answer 2} \)
• ADD \( \text{answer 2} + \text{answer 1} \)
• SUBTRACT \( \text{answer 2} - \text{answer 1} \)

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
NARRATOR VO - 2ND AUDIO

Work out the answer to this problem to find B.J.'s net pay.

TEXT SCREEN:
WORK OUT THE ANSWER TO THIS PROBLEM TO FIND B.J.'S NET PAY.

TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE, TOUCH ENTER.
Money Related Forms
Scene MF-1
Character 2, Manny
Kitchen

VIDEO - Manny is in kitchen - headed toward desk. He passes a co-worker.

    WORKER
    Manny, we're almost out of honey.

    MANNY
    I know. I'm gonna do the ordering right now. (walks on)

Manny at desk

    MANNY
    Where are the order forms? (hunts through stack of papers) Ah, here it is - The Naturally Sweet Company.

Shot of whole form then zoom in to upper part

    MANNY
    (reading first note) Honey, five gallons. (traces finger down description column until he finds honey; refers back to note to verify amount to order) Okay, honey.

during CU upper part of form

    MANNY VO 1ST AUDIO
    Let's see. Honey comes in one gallon jars and we need five gallons.
GRAOhIC/TExT SCREEN: ORDER FORM

NARRATOR VO - 2ND AUDIO
How many one gallon jars of honey should Manny order if he wants five gallons altogether? Touch the blue dot next to the correct answer.

TEXT SCREEN:
HOW MANY ONE GALLON JARS OF HONEY SHOULD MANNY ORDER IF HE WANTS FIVE GALLONS ALTOGETHER?
• ...
• ...
• ...
• ...
TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.

VIDEO: MANNY PUTS HONEY NOTE FACE DOWN AND PICKS UP NEXT NOTE.

MANNY
Okay, that's it for honey. Next, white sugar. (traces finger down description column until he finds white sugar; refers back to note to verify amount to order) That comes in ten pound bags. And we need (looks at note) thirty pounds.
How many ten pound bags of white sugar should Manny order if he wants thirty pounds altogether?

Touch the blue dot next to the correct answer.
VIDEO - Manny at desk moving on to next note.

MANNY
Rolling now, boy. Next, we have (reading note) dark brown sugar. It comes in five pound sacks and we need sixty pounds. That's twelve bags we need (writes in number). And finally, (picks up last note) molasses. We need two-and-a-half gallons and it comes in half-gallon containers. So, we need five of them. (writes in number)
Done! Well, with the first step anyway. Let's see, what's next?

GRAPHIC/TEXT SCREEN: ORDER FORM

NARRATOR VO - 2ND AUDIO
What does Manny need to do next?
• Figure sales tax on the total order.
• Determine quantity of each product.
• Sign and mail the form.
• Figure total item prices.

TEXT SCREEN:
WHAT DOES MANNY NEED TO DO NEXT?

• FIGURE SALES TAX ON THE TOTAL ORDER.
• DETERMINE QUANTITY OF EACH PRODUCT.
• SIGN AND MAIL THE FORM.
• FIGURE TOTAL ITEM PRICES.

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
MANNY
Okay, next I need to figure out the total item price for each item.

GRAPHIC/TEXT SCREEN: ORDER FORM

NARRATOR VO - 2ND AUDIO
What does Manny need to do to find out the total item price for the honey?

TEXT SCREEN:
WHAT DOES MANNY NEED TO DO TO FIND OUT THE TOTAL ITEM PRICE FOR THE HONEY?

• MULTIPLY $9.00 X 1
• MULTIPLY $9.00 X 9.00

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
NARRATOR VO - 2ND AUDIO

What is the total item price for the honey?

TEXT SCREEN:
WHAT IS THE TOTAL ITEM PRICE FOR THE HONEY?

TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE, TOUCH ENTER.
MANNY
So I've got the cost of each product figured out. I think I should do the sales tax now.

GRAPHIC/TEXT SCREEN: ORDER FORM

NARRATOR VO - 2ND AUDIO
What does Manny need to before he can figure the sales tax?
• Find the subtotal of the order.
• Find the total weight of the order.
• Find the total number of products.
• Find the shipping charges.

TEXT SCREEN:
WHAT DOES MANNY NEED TO BEFORE HE CAN FIGURE THE SALES TAX?

• FIND THE SUBTOTAL OF THE ORDER.
• FIND THE TOTAL WEIGHT OF THE ORDER.
• FIND THE TOTAL NUMBER OF PRODUCTS.
• FIND THE SHIPPING CHARGES.

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.

MANNY VO - 1ST AUDIO
So, I'll add these together. (mumbles a bit as if figuring) Ta da! The subtotal is one hundred eighty-seven dollars even. (writes number on screen)
Next, I need the tax chart.

gets out chart; show whole then zoom in on bottom

This chart only goes up to one hundred dollars!

(slightly disgusted) Now how am I supposed to figure five percent tax on one hundred eighty-seven dollars if the chart only goes up one hundred dollars?

GRAPHIC/TEXT SCREEN: ORDER FORM

NARRATOR VO - 2ND AUDIO
What does Manny need to do to find the five percent sales tax on one hundred eighty-seven dollars?

TEXT SCREEN:
WHAT DOES MANNY NEED TO DO TO FIND THE SALES TAX ON ONE HUNDRED EIGHTY-SEVEN DOLLARS?

- ADD $5.00 + $5.00
- ADD $5.00 + $4.35
- SUBTRACT $5.00 - $4.35
- ADD $5.00 + $4.34

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.
MANNY

Then my tax is nine dollars and thirty-five cents (writes number on form) Now, to figure the shipping weight.

How much does all this weigh? Let's see... white sugar - we're getting three bags and they weigh ten pounds each - three times ten equals thirty pounds (writes in number). Brown sugar - twelve times five pounds equals (pause) sixty pounds. Okay. (writes in number) Five gallons of honey. Each gallon weighs nine pounds.
MANNY VO - 2ND AUDIO
That's forty-five pounds of honey. Now, two-and-a-half gallons of molasses. A half-gallon weighs four pounds.

GRAPHIC/TEXT SCREEN: ORDER FORM

NARRATOR VO - 2ND AUDIO
How much do five, half-gallon containers of molasses weigh?

TEXT SCREEN:
HOW MUCH DO 5, HALF-GALLON CONTAINERS OF MOLASSES WEIGH?

TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE, TOUCH ENTER.

CU on weights; Manny traces with finger

MANNY VO
That's twenty pounds. Now, I have to figure the total weight -- that's thirty plus sixty plus forty-five plus twenty ... uh... equals one h...ndred fifty-five pounds.

MANNY VO
One hundred fifty-five pounds (writes number on form) Okay, shipping charges. I'd better check the chart.
(gets out chart) All right. I know we're in zone one, and the total weight is one hundred fifty-five pounds.

NARRATOR VO - 2ND AUDIO
What is the shipping charges for the order?

MANNY
(writing in shipping charge)
That's that on the shipping charges. I've got the subtotal, that's $187.00, and tax, that's $9.33, and shipping charges, that's $17.89.
NARRATOR VO - 2ND AUDIO

What is the total cost of the order?

TEXT SCREEN:
WHAT IS THE TOTAL COST OF THE ORDER?

TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE, TOUCH ENTER.

MANNY

I feel like a regular mathematical wizard, figuring out all this stuff. (writes in total $214.24, closes folder, and drops order into Mrs. Y's box) Whew, what a day! (takes off apron) I'm out of here!

Carol goes by with pizzas and they say something to each other.
Working with Money Related Forms:  Recording Payment and Computing Balance Due

Scene MF - 2
Character 4, Nikki
Small gallery, frame shop

It is getting toward the end of the day and business has slowed down, so Nikki has decided to do some of the shop paperwork. Nikki is opening the last of the day's mail for the shop with a letter opener.

NIKKI
Oh good, we got another payment from Mr. Parwood for that picture he bought a few months ago. He must be just about finished paying for it.

Nikki searches through the little file where these records are kept and pulls out Mr. Swindell's account record. She lays it on the counter next to the check. It is in statement format with payments and balance forward recorded. The picture originally cost $160. 3 payments have been made. There is currently a balance due of $55.00.

NIKKI
Let's see. To begin with he owed $160.00. The first month he paid $40.00. The second month he paid $40.00. And last month he paid $25.00. So now he owes $55.00 and this check is for $25.00.

GO TO CLOSEUP OF CHECK AND STATEMENT SIDE BY SIDE.

GO TO VERTICAL SPLIT SCREEN WITH STILL OF CHECK AND STATEMENT ON THE LEFT AND TEXT SCREEN ON RIGHT.

NARRATOR VO (1ST AUDIO)
What does Nikki need to do to find out how much money Mr. Parwood still owes?

================================================================================

WHAT DOES NIKKI NEED TO DO TO
FIND OUT HOW MUCH MONEY MR. BARWOOD STILL OWES?

1. ADD $55.00 + $25.00
2. SUBTRACT $160.00 - $25.00
3. ADD $55.00 + $160.00
4. SUBTRACT $55.00 - $25.00

TOUCH THE BLUE DOT NEXT TO THE CORRECT ANSWER.

================================================================================
WHATEVER THE STUDENT SELECTS COMES UP ON A FULL TEXT SCREEN.

NARRATOR VO (2ND AUDIO)
Work out this problem to find out how much Mr. Barwood still owes.

TEXT SCREEN:
WORK OUT THE ANSWER TO THIS PROBLEM TO FIND OUT HOW MUCH MR. BARWOOD STILL OWES.

$55.00
- $25.00

(RESPONSE WINDOW HERE)

TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU'RE DONE TOUCH ENTER.

NIKKI
Okay, that's $17.39 in change that needs to be deposited.

GO TO VERTICAL SPLIT SCREEN WITH GRAPHIC OF DEPOSIT SLIP ON LEFT AND TEXT ON RIGHT.

NARRATOR VO - 2ND AUDIO
Where on the deposit slip should Nikki record the change she is depositing? Touch the deposit slip in the correct place.

TEXT:
WHERE ON THE DEPOSIT SLIP SHOULD NIKKI RECORD THE CHANGE SHE IS DEPOSITING?

TOUCH THE DEPOSIT SLIP IN THE CORRECT PLACE.
Nikki is just finishing counting out the bills that are to be deposited.

NIKKI
Fifty-seven, Fifty-eight, Fifty-nine. So that's fifty-nine dollars in bills.

GO TO SPLIT TEXT SCREEN AS ABOVE WITH GRAPHIC OF DEPOSIT SLIP ON LEFT AND TEXT ON RIGHT.

NARRATOR VO - 2ND AUDIO
Where on the deposit slip should Nikki record the bills she is depositing? Touch the deposit slip in the correct place.

Graphic of Deposit Slip

TEXT:
WHERE ON THE DEPOSIT SLIP SHOULD NIKKI RECORD THE BILLS SHE IS DEPOSITING?
TOUCH THE DEPOSIT SLIP IN THE CORRECT PLACE.

She puts the bills in the deposit bag.

CLOSEUP SHOT OF NIKKI, THE DEPOSIT SLIP, AND THE DEPOSIT BAG.

NIKKI
Oh, I almost forgot. I need to deposit Mr. Barwood's check for $25.00 too.

She reaches over to the cash box (drawer), gets the check, looks at it, and puts it in the deposit bag.

GO TO SPLIT GRAPHICS SCREEN AS ABOVE WITH GRAPHIC OF DEPOSIT SLIP ON LEFT AND TEXT ON RIGHT.

NARRATOR VO - 2ND AUDIO
Where on the deposit slip should Nikki record Mr. Barwood's check? Touch the deposit slip in the correct place.

Graphic of Deposit Slip

TEXT:
WHERE ON THE DEPOSIT SLIP SHOULD NIKKI RECORD MR. BARWOOD'S CHECK?
TOUCH THE DEPOSIT SLIP IN THE CORRECT PLACE.
NARRATOR VO - 2ND AUDIO

What is the total amount of money that Nikki is depositing?

TEXT:

WHAT IS THE TOTAL AMOUNT OF MONEY THAT NIKKI IS DEPOSITING?

TOUCH THE NUMBERS ON THE BAR TO ANSWER. WHEN YOU’RE DONE, TOUCH ENTER.

Nikki is standing in front of the counter holding the phone up to her ear.

NIKKI

Come on, B.J., where are you?

B.J. walks in the door.

B.J.

Are you looking for me? I had to work late. Are you ready to go?

NIKKI

(Holding up deposit bag)
I just need to drop this off in the night depository at the bank. Oh, Manny and Tom are meeting us at the movies. So, how was work?

B.J.

I got a raise...and a bonus.

NIKKI

Wow, that’s great. So...you’re buying the pizza after the flick tonight.

B.J.

Well............
NIKKI
Yeah, it's settled.

B.J.
I guess it's true.

NIKKI
What is?

B.J.
The more you make, the more they take.

They are moving toward the door during this conversation and finally open it and walk out. Lights out. Shop bell rings. Shot of darkened shop.

epr/4/28/88
APPENDIX D
Instructional Working Scripts

TO
FINAL REPORT
AN INTERACTIVE VIDEODISC PROGRAM TO
EVALUATE AND TRAIN JOB-RELATED
MATH SKILLS FOR TRANSITION

FOR
GRANT #G008730292

Submitted to:

U.S. Department of Education
Office of Special Education Programs

Carolyn DeMeyer Harris
Elaine Robey
Kathleen Wholey
Robert Pelis

Macro Systems, Inc.

November 30, 1989
APPENDIX D CONTENTS
Instructional Working Scripts

1. OPENING
2. MEASURING LENGTH [LM]
3. MEASURING PERIMETER AND AREA [GM]
4. MEASURING CAPACITY [CM]
5. MEASURING WEIGHT [WM]
6. MEASURING TEMPERATURE [PM]
7. MEASURING TIME [TM]
8. MONEY VALUES AND RELATIONSHIPS [MV]
9. MONEY EARNED [ME]
10. MONEY-RELATED FORMS [MF]
<table>
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<th>AUDIO</th>
<th>SCREEN</th>
<th>PROPS, ETC.</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 - MUSIC</td>
<td>#1 - OPENING SCREEN: Working with Math A Math Skills Instructional Program Copyright © 1989 Macro Systems, Inc.</td>
<td></td>
</tr>
<tr>
<td>#2 - NARRATOR VO: Our world is becoming more complicated. To be prepared for the changes - and move toward success in the future, everyone needs to be able to use mathematics. This program provides instruction in work-related math skills that you may need to use on the job. Mr. Barwood is the owner of a small restaurant. He knows first-hand the many kinds of math-related problems young workers face. And, he thinks he’s been pretty successful in helping his employees learn ways to solve these problems. You’ll be working with Mr. Barwood on job-related math skills. But, first here is information on how to work with this program. #3 - NARRATOR VO: Each lesson operates in the same way. Mr. Barwood will talk about a problem and how to solve it. He will show you examples and then let you practice on your own. After every question you’ll get some feedback. Mr. Barwood will tell you if your answer is correct. If your answer is wrong, he’ll try to give you a hint and have you answer the problem again.</td>
<td>#2 - MOTION: selected segments from footage</td>
<td></td>
</tr>
<tr>
<td>#3 - TEXT/GRAPHIC SCREEN:</td>
<td></td>
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</table>
NARRATOR VO: If you really have trouble with a lesson, you'll get a message about getting some help. Throughout the program you'll be asked what you want to do next. The choices will appear in boxes on the screen. For example:
What do you want to do now?
• Go on
• Try problem again
• Try lesson again
• Quit and go to menu
• Take the quiz
You just touch the one you want.

When you decide you're ready to take the quiz, you'll answer questions just like the ones you practiced. But, you won't get any feedback after each answer. When you've finished the quiz, you'll get a score that shows how many right and wrong answers you had.

You'll always touch the screen to answer the questions. But, you'll touch it in different ways for different kinds of questions. Here's a demonstration to show you examples of the questions and how to answer them. Don't worry, though. When you're working in the program, each question always has directions for you.

For multiple choice questions you will touch the blue dot by the answer you want. Look at the first example.
• How many inches equal 1 foot?
• There are 4 choices, but 12 inches is the correct answer.
• So, you touch the blue dot next to that choice.
AUDIO

NARRATOR VO: • The dot changes color to show that your answer has been entered.
  • And, the program goes on.

Yes-No questions work the same way.
• Are there 12 inches in 1 foot?
• When you touch the blue dot, it changes color.
  • And, the program goes on.

You’ll answer some questions by touching numbers on a bar and then touching the "enter" box. For example:
• How many inches equal 1 foot?
• Your answer is “12.” So, you touch 1, and then 2.
  • Oops! It’s the wrong number.
  • When this happens, just touch the "retry" box. And the problem will start over.
• Now the answer is correct.
• You touch “enter.”
  • And, the program goes on.

Sometimes, the choices are shown as pictures, but they work the same way.
• Which picture shows 1 foot?
• You touch the blue dot next to the answer you want.
  • It changes color.
  • And, the program goes on.

Some questions want you to answer by touching a certain place on the screen. For example:
• On this pay stub, you’re asked how much was deducted for state taxes.
• You find the amount on the pay stub and touch that number.
  • Then, the program goes on.
NARRATOR VO:
Some questions want you to figure out how much of something you need for a job. You touch a picture as many times as you need to and then touch “enter.” For example:
- How many times should you fill this cup to measure 3 cups of milk?
- You see that it holds 1 cup and you want 3 cups.
- So, you touch it 3 times.
- The cups show up on the screen. You check to make sure it’s the answer you want. 3 cups is correct.
- So, you touch “enter.”
- And, the program goes on.

To answer questions that use the clock radio, you touch the boxes to set the time you want and then touch enter. For example:
- Set the clock radio to the correct time.
- The watch shows 12:30.
- So, you touch each box until it shows the number you want.
- You check to make sure it’s the answer you want. 12:30 is correct.
- So, you touch “enter.”
- And, the program goes on.

To answer questions when you’re counting money into groups, you touch the coin you want from the top box. Watch carefully:
- Touch a coin to put it in a group. When you have enough coins in a group to equal $1.00, touch the dollar sign box. Keep going until you have all the one-dollar groups you want. Then touch enter.
- When you touch a coin, it will move to the one-dollar grouping box.
When you have as many coins as you want to make exactly one dollar, you touch the dollar sign box. The grouping box will empty, and a small one-dollar will show up along the bottom of the screen. When you've made all the one-dollar groups you can, you touch "enter." And, the program goes on.

Do you want to try a sample question for yourself?
Do you want to try another?

A "help" box is always on the screen with the questions. When you touch it, you'll see 3 boxes:
- Touching "Answers" describes how to work with this program and answer the different kinds of questions.
- Touching "Section Summary" takes you to a short explanation of the kinds of math problems you have in that section.
- Touching "Glossary" gives definitions of some of the unusual or difficult words used in the program.

If there is some other help available, you can see it by touching "Special."

Work carefully and do your best. Good luck.

**CORRECT ANSWER FEEDBACK:**
[to be placed in 3-5 places on each side]

Yes, that's the right answer. You're doing a good job.
Yes, that's the correct answer. Congratulations!

Yes, your answer is correct. Keep up the good work.

Yes, you got it right. Good job!

UNANTICIPATED ANSWER FEEDBACK:
[to be placed in 3-5 places on each side]

No, that's the wrong answer.
Try again.

No, that's incorrect.
Keep trying.

No, your answer is incorrect.
Keep trying.

No, you got it wrong.
Good luck next time.

MENU QUESTIONS/STATEMENTS:
[to be placed in 3-5 places on each side]

What do you want to do now?

Sorry, you missed your third try on that problem. Here is the correct answer.

You're still having trouble with these problems. Remember, in the instruction you can get more information for many of the problems by touching HELP and then touching SPECIAL.

You're still having trouble with these problems. Talk to your instructor about getting some extra help.
You have completed this lesson. What do you want to do now?

**MENU PHRASES:**
[to be placed 3 - 5 times on each side]

Go on
Quit and go to menu

Go on
Quit and go to menu
Take the quiz

Go on
Try problem again
Quit and go to menu
Take the quiz

Go on
Try problem again
Quit and go to menu
Take the quiz

**MENU PHRASES cont**

Try lesson again
Quit and go to menu
Take the quiz

Quit and go to menu
Take the quiz
HELP for TYPE of QUESTION cont:
[to be put on Side 2 - close to middle]

Some questions want you to figure out how much of something you need for a job. You touch a picture as many times as you need to and then touch "enter."

To answer questions when you're counting money into groups, touch the coin you want from the top box. Touch a coin to put it in a group. When you have enough coins in a group to equal $1.00, touch the dollar sign box. Keep going until you have all the one-dollar groups you want. Then touch enter.

STANDARD DIRECTIONS
[to be put in 2 - 3 places on each side]

#1: Touch the blue dot next to the correct answer.

#2: Touch the numbers on the bar to answer. When you're done, touch enter.

#3: Touch the numbers on the bar to answer. The cursor will move automatically. When you're done, touch enter.
SPECIFIC DIRECTIONS WITHIN LESSONS [each to be put in appropriate lesson]

CM - p. 5: Touch the spoon as many times as you need. When you're done, touch enter.

CM - p. 22: Touch the cup as many times as you need. When you're done, touch enter.

CM - p. 32: Touch the recipe at the correct place.

WM - p. 9: Touch the numbers on the bar to answer. The cursor will move automatically from pounds to ounces. When you're done, touch enter.

TM - p. 8: Touch the boxes on the clock radio to set the time. Each touch will change the number in a box. When you're done, touch enter.

TM - p. 17: Touch the numbers on the bar to answer. The cursor will move automatically from hours to minutes. When you're done, touch enter.

LM - p. 10: Touch the numbers on the bar to answer. The cursor will move automatically from feet to inches. When you're done, touch enter.

LM - p. 13: Touch the pipe at the correct place.

molding
NARRATOR VO:

SPECIFIC DIRECTIONS WITHIN LESSONS
[each to be put in appropriate lesson]

MV - p. 5: Touch the coin as many times as you need. When you're done, touch enter.

MV - p. 9: Touch a coin to put it in a group. When you have enough coins to equal $1.00, touch the DOLLAR SIGN BOX. Keep going until you have all the one-dollar groups you want. When you're done, touch enter.

MV - p. 19: Touch a piece of money as many times as you need. When you're done, touch enter.

ME - p. 12: Touch the paystub at the correct place.

MF - p. 2: Touch the order form at the correct place.

MF - p. 13: Touch the deposit slip at the correct place.
Host: People use linear measurement all the time without thinking much about it. For instance, when you take a piece of tape off a roll to seal a package, you probably unconsciously estimate how long it should be.

Host VO: One common unit we use to measure length is the foot. These things, left over from our recent remodeling, are about one foot long.

Host VO: Which of these things is about one foot long?

CU to still of things about a foot long - length of pipe, wire and baseboard (heavy black plastic kind).

CU to still of surface containing things of different lengths: 2-inch nail, 2-foot metal carpet strip, 1-foot piece of molding, ball point pen, tack, hammer. Blue-dot question.

In background, peg board with assorted tools hanging (hammer, saw).

measuring tools: ruler, yardstick, measuring tape

materials for shelves: 1 inch nails, 6 foot boards

pipe
wire
baseboard (black plastic)

large nail
metal carpet strip
ball point pen
hammer
April 21, 1989 - kw

Linear Measurement

Screen

Props, etc.

Narrator VO: Touch the blue dot next to the correct answer.

Host VO: Feedback (hammer)
Yes, you got it right. Good job!
Incorrect (for carpet strip):
No, that's incorrect. A foot is shorter than that.
Incorrect (nail, pen, tack):
No, that's incorrect. A foot is longer than that.

Host VO: For things that are less than a foot long, the unit we usually use to measure them is the inch. These things are about 1 inch long. Our instructions tell us to use 1-inch nails.

Host: This is a neat way of remembering about how long an inch is. See?

When I need to know how long one inch is, I just look at my pointer, here, between the knuckles and that gives me a pretty good idea of the right length.

Camera closes in further to still of host holding the 1-inch nail up between two knuckles of his pointer finger [pinky finger -- depends...]

[At any rate, the two are]
April 24, 1989 – kw

Audio

Host VO: Which of these things is about one inch long?

Feedback: Yes, you got it right. Good job!
Incorrect (2-inch nails and screwdriver): No, that’s incorrect. An inch is shorter than that.
Incorrect (thumbtacks): No, that’s incorrect. An inch is longer than that.

Host VO: Most things won’t be exactly one foot or one inch, but somewhere in between a foot and an inch.

Host VO: This is 2 feet.

Host VO: This is 4 inches.

Linear Measurement

Screen

Props, etc.

Still of thumbtacks, 2-inch nails, small screwdriver, 1-inch wood screws. Blue dot question.

nails (2 inches)
thumbtacks
screwdriver
(Elaine’s)
1-inch wood screws

Still of thumbtacks, 2-inch nails, small screwdriver, 1-inch wood screws. Blue dot question.

nails (2 inches)
thumbtacks
screwdriver
(Elaine’s)
1-inch wood screws

Graphic of pipe, screwdriver, baseboard molding

2-foot long pipe
4-inch long screwdriver
(Elaine’s)
1-foot 1-inch piece of baseboard molding

2-foot long pipe
4-inch long screwdriver
(Elaine’s)
1-foot 1-inch piece of baseboard molding
Host VO: People often use abbreviations for words they spell frequently. There are 2 abbreviations for foot. "F T period" is one. A small mark that looks like an apostrophe is the other.

We have 2 abbreviations for inch, too. "I N period" is one. Marks that look like quotation marks are the other.

This is 1 foot, 1 inch. When something is measured in feet and inches, we give the number of feet first, since feet are larger. Then we give the number of inches. Remember this and it will help you remember which symbol goes where. One mark for feet, it goes first. Two marks for inches, they come second.

Twelve inches make up one foot. Twelve inches, 1 foot. One foot, 12 inches. They are the same.

Host VO: How many inches equal 1 foot?

Twelve inches make up one foot. Twelve inches, 1 foot. One foot, 12 inches. They are the same.

Graph of 2 lengths of ceiling trim, identical, one labelled 1 foot and the other, 12 inches, lying horizontally, stacked vertically.

Text screen. Number bar question.
Host VO: Feedback: Yes, that's the right answer. You're doing a good job.
Incorrect (13 and up): No, that's incorrect. A foot is shorter than that.
Incorrect (11 and down): No, that's incorrect. A foot is longer than that.

Host VO: Are these things the same length?

Feedback (no): Yes, your answer is correct. Keep up the good work.
Incorrect (yes): No, you got it wrong. A foot is twelve inches long.

Host VO: A unit we can use to measure things longer than a foot is the yard. A yard is 3 feet long.

Host VO: Yards are usually used to measure fairly long distances. For instance, we might measure the distance between our house and a
neighbor's house in yards.
Host: Most things we come across, though, we measure in feet, inches, or a combination of feet and inches.

Host: Some things are usually measured in feet and inches and other things, all in inches. But sometimes we need to compare lengths measured in these two different ways.

Host: For instance, I know this shelf measures 5 feet, 4 inches. I want to buy some trim to go along its edge.

Host VO: The trim is sold by the inch at the hardware store. So I need to find out how many inches are the same as 5 feet, 4 inches.

Host VO: To do this, I need to find out how many inches are in 5 feet, and then add the number of inches from my original measurement, four, to that number.

Host VO: The first thing I do is remember there are 12 inches in 1 foot.
Host VO: Next, I write how many feet I am changing to inches, to get the number of inches in those feet. I have 5 feet, so I'll multiply 12 times 5.

So that's ... 60 inches in 5 feet.

Finally, I add my original inches to this number. That's 4 inches to add in

and that's 64 inches altogether. So I need to buy 64 inches of trim for this shelf.

Now you try one.

You have a board 3 feet, 9 inches long. How many inches of trim do you need altogether?

NARRATOR: Touch the numbers on the bar to answer. When you're done, touch ENTER.

Host VO: Feedback: Yes, you got it right. Good job!
Host VO: Incorrect (for 111):
No, that's incorrect.
Multiply the number of feet by 12 and then add in the original number of inches.
Incorrect (for 39): No, multiply the number of feet by 12, since there are 12 inches in a foot. Then add in the inches.

Host VO: Sometimes you may know the number of inches but need to change them to feet and inches. For instance, suppose you had a 28-inch piece of pipe.

Host VO: When you are changing a measurement from smaller units -- like inches -- to larger units -- like feet, you will have fewer of the larger unit. It makes sense, then, that you should divide. We know that there are 12 inches in a foot. So, here, we could divide 12 into 28 to find the number of feet and inches.
Host VO: Of course, a lot of people have trouble with division. So, for a small number, like this, you can always substitute repeated subtraction for division. It works like this:

To change from inches to feet and inches, we remember that 12 inches is equal to 1 foot. We subtract 12 inches (or 1 foot) at a time, until we have less than 12 to subtract.

When less than 12 remains, that number is the number of inches left over.

If we get a zero, at the end of our subtraction, that means there are no inches left over.

Host VO: Let's do an example. We have 28 inches of this pipe. How many feet and inches is that?

We ask, Do we have 12 inches or more? We do, so we subtract 12 inches.

We ask again, Do we have 12 inches or more? Yes, we do, so we subtract 12 inches.
Host VO: Do we have 12 inches or more? No, we don’t. So this number is our remaining number of inches.

Now we count the number of times we subtracted 12 inches. One, two. That’s 2 feet. And we have 4 inches remaining. 28 inches is the same as 2 feet, 4 inches.

Host VO: Now you try one. This piece of wire is 19 inches long. How much is that in feet and inches?

NARRATOR VO: Touch the numbers on the bar to answer. The cursor will move automatically from feet to inches. When you’re done, touch ENTER.

Host VO: Feedback (1’, 7”): Yes, that’s the right answer. You’re doing a good job. Incorrect (wrong number of inches): No, that’s the wrong answer. Always check your subtraction.
April 21, 1989 - kw
Audio

Linear Measurement
Screen

Host VO:
Incorrect (wrong number of
feet): No, that's the wrong
anmier. Always check how many
times you subtract 12.
Incorrect (unanticipated): No,
that's the wrong answer. Try
again.

Host VO: Try one more.
This
is 33 inches long. How much
is that in feet and inches?

Feedback (2', 9"): Yes, you
got it right. Good job!
Incorrect (wrong number of
inches): No, your answer is
wrong. Always check your
subtraction. Incorrect (wrong
number of feet): No, your
answer is wrong. Always check
how many times you subtract
12.

Incorrect (unanticipated): No,
your answer is wrong. Try
again.

2)

Graphic screen, piece of
molding labelled 33 inches.

Props, etc.


Host VO: These are some of the standard tools used to measure length.

Standard rulers are 1 foot, that is, 12 inches, long. Yardsticks are frequently used to measure things longer than 1 foot, and measuring tapes are generally used when things are longer than 3 feet.

Host VO: Measuring tools measure in inches always, and feet sometimes.

Host: The way we actually go about measuring length with any of these is pretty much the same.

Host: Here, I'll measure this piece of wood to show you how. You line up the zero-point, almost always the end, with one end of the wood. You find the length by looking at the mark at the other end of the wood.
April 21, 1989 - kw
Audio

Host VO: Where should you start measuring the pipe?

NARRATOR VO: Touch the pipe at the correct place.

Host VO: Where should you stop measuring the pipe?

NARRATOR VO: Touch the pipe at the correct place.

Host VO: Let's say you want to measure this piece of trim. There are a few steps you can follow to help you pick the right tool.

Host VO: First: Roughly estimate how long the thing you're measuring is; Two: Check the lengths of the tools you have. You want to use a measuring tool close to the length of what you're measuring but longer; Three: Compare the estimate you made to the length of the tools you have;

Linear Measurement Screen Props, etc. lm:13

Graphics screen. 5" pipe in middle of screen. Ruler to be placed below and off to one side.

Same graphics screen, but with ruler placed where student had indicated it should go.

Graphic plots with host voice. Graphic plots with host voice. of 3 measuring tools and a 2-foot long piece of trim.

Text screen Plots on right side of screen with host voice: Choosing a measuring instrument 1) Estimate length 2) Check lengths of available tools 3) Compare estimate with lengths of tools
April 21, 1989 - kw

Linear Measurement

Host VO:
Four: Look at the tools that you think are long enough, and ask yourself which would be easiest to handle.

Host: So first, you estimate (or make your best guess about) how long the thing is. Estimating gets easier the more you do it. If you are in a job where you're measuring things all the time, estimating length will become easy for you.

Host: I estimate that this trim is about 2 feet long.

Host VO: Our next step is to check the lengths of the tools we might use. Let's see, our ruler is 1 foot long, our yardstick, 3 feet long and our measuring tape, 6 feet long.

Now, we compare the estimated length with the length of our tools. The length of the tool...
Host VO: we choose should be greater than our estimate.

So here, our 1-foot ruler is rejected -- it's too short. But the lengths of these two are both longer than 2 feet, so they're still in the running.

Host: Next, we look at the practicality of using these two to measure the length. Could either of these be used to measure the trim? Sure, both could do the job.

Host: Finally, we choose the best tool for the job by choosing the one with the length closest to the length we've estimated. For us, the yardstick, which can measure up to 3 feet, is closer than this 6-foot measuring tape to our estimate of 2 feet, so I'll choose it. I think I'm finally ready to measure this. Ah, just right. See how the end of the trim falls between the two ends of the yardstick? This was a good choice for a tool.

Linear Measurement Screen

Props, etc.

Graphic screen. X overlay is plotted over the 1-foot ruler.

Same still. Arrows on two remaining scales. "Ask, Which is easiest to handle?" plots.

Motion Host picks up yardstick and lays it alongside the trim. A successful measure, showing the length to be about 2 feet, but not exactly. Then camera pulls back to include the host in the shot.
Host VO: I think you're ready to try choosing one now. Let's see, to get you started, let's estimate this piece of baseboard is about 9 inches long. Which of these tools is appropriate to measure 9 inches?

**Host VO: Feedback (ruler):** Yes, that's the right answer. Good job! Incorrect (anticipated, either larger tool): No, that's incorrect. That instrument will take the measure, but usually it's best to choose the instrument closest in length to what you're measuring.

Host VO: Here's another one. Suppose we had a piece of pipe. We estimate it's about 4 feet long. Which of these tools is most appropriate for measuring the pipe?

**Host VO: Feedback (tape measure):** Yes, that's the correct answer. Congratulations! Incorrect (anticipated, either shorter tool): No, that's incorrect. This instrument is too short. You could not
Host VO:
measure the pipe unless you
moved the tool.
Host: So now, all we have left in measuring length is reading the actual measurement on the tool. To measure this strip of molding, first I position the molding here so that it lines up with the end of the ruler. Once I’ve done that I just look at where the other end of the molding comes on the ruler.

Host: Most tools for measuring length are like this one. Each inch is marked on the instrument. The end of this molding is right at the line for the number 9. So, this strip of molding is 9 inches long.

Host VO: How long is this piece of molding?

Motion Host on screen. Standing by counter with ruler and short piece of molding 9 inches long on counter. Lines up ruler next to piece of molding. Go to closeup of ruler and molding.

Motion Host points to end of the piece of molding next to the 9 as he says the length.

Still of closeup of new piece of molding 11 inches long and ruler from above. Number bar input.
April 21, 1989 - kw
Audio

Host-VO: Feedback: Yes, your answer is correct. Keep up the good work.
Unanticipated Incorrect: No, that's the wrong answer. Try again.
Anticipated incorrect: For
Host-VO: decimal number
between 10 and 12, but not including 10, 11, or 12): No, that's the wrong answer.
You're close, but the end of the molding is right at a marked number.

Host VO: You've probably noticed the small lines between each of the inch marks. To read lengths that don't fall right at a number, we have to be able to figure out what part -- or fraction -- of an inch is indicated by the small lines.

Host VO: Reading a measurement on a ruler, yardstick or measuring tape that's between 2 whole inch numbers -- like this -- is easy once you know the trick. I'll tell you how with a piece of wire and ruler.

Still on left half of screen of ruler. At least two inch marks (7 and 8) and all small lines between the two must be clearly visible. Piece of thick wire is lined up to be measured at 7-3/4 inches.

Arrows point to 7 and 8 as mentioned. 7 plots when host says to write it down as whole number. Then, at appropriate times, denominator and fraction bar, and numerator plot. Abbreviated form of rules also plotting on right side at same time.
Host VO: First, you need to locate where the end of the wire comes on the ruler. Here it’s between 7 and 8 inches. You write down the smaller number as your whole number. Then count the number of spaces between the two numbers. This is the number of parts -- the bottom part of your fraction. Write that down too, with a fraction bar above it. Next, count the lines between the smaller number that you’ve written down and the point on the ruler where the end of the wire is. That’s the top of your fraction. Write that down too. This number is the length. So the length of this piece of wire is 7 and 3 fourths inches.

Host VO: Now you try. What is the length of the bolt?

Graphic screen. Whole number=Smaller of two numbers around end of object. Bottom number=Number of spaces between smaller number and larger number. Top number=Number of lines between smaller number and end of object.

Audio

Feedback: Yes, you got it right. Good job!
Incorrect (anticipated, for 3-2/4): No, that's incorrect. The smaller of the two numbers near the end of the bolt is the correct whole number for your measure.
Incorrect (anticipated for 2-3/4): No, that's incorrect. Always count the lines for the top of your fraction.

Host VO: Sometimes the fraction part of a number can be written in a more familiar way. For instance, 2/4 would probably look more familiar to you if we wrote it 1/2. These two fractions mean the same thing, but people usually say 1/2.

So 2-2/4 = 2-1/2.

Do one more. How long is this metal strip?

Same graphic. Right side now plots with 2/4 = 1/2.

2-2/4=2-1/2 plots.

Graphic of same ruler and metal strip measuring 10 3/4 inches. Blue dot question.
Host VO: Yes, your answer is correct. Keep up the good work!
Incorrect for 11-3/4 inches:
No, that's the wrong answer.
The smaller of the two numbers near the end of the metal strip is the correct whole number for your measure.
Incorrect for 10 2/4 inches:
No, that's the wrong answer.
Always count the lines for the top of your fraction.
Host VO: Of course, not all countries measure the length of things in inches, feet, and yards. In fact, in most places length is measured in units of another system -- the metric system. Its most common length units are centimeters, meters, and kilometers. Usually if you need to measure something using metric units, you will use a ruler or tape which has centimeters -- and maybe meters -- marked on it. So, it’s not often that you need to change lengths from one system to another.

Host VO: But, there are a couple of rough estimates about how metric length compares to our usual length measurements that are useful to keep in mind. First, a meter is about the same length as a yard -- just a little bit longer. So, if you remember how long a yardstick is, you have a very good idea about the length of a meter.
April 24, 1989 - kw
Audio

Host VO: A centimeter is very
short -- less than half as
long as one of our inches. In
fact, it takes one hundred
centimeters to equal one
meter.

Host VO: The kilometer is the
longest metric unit.
Kilometers are used for
measuring long distances --
like our mile. It takes one
thousand meters to equal one
kilometer.
Host VO: But, a kilometer is not as long as a mile. In fact, one kilometer is only as long as about 2/3 of one mile.

Which unit is about the same length as a meter?

Feedback (correct): Yes, that’s the right answer. You’re doing a good job.

Incorrect (anticipated, for centimeter): No, that’s the wrong answer. A centimeter is even shorter than an inch.

Incorrect (anticipated for kilometer): No, that’s the wrong answer. A kilometer is the same as one thousand meters.

Incorrect (anticipated for inch): No, that’s the wrong answer. An inch is much shorter than a meter.

How many centimeters equal one meter?

Feedback (correct): Yes, that’s the right answer. You’re doing a good job.
Incorrect (anticipated for 10 and 50): No, that’s the wrong answer. Think. It takes 100 cents to make a dollar. It takes one hundred centimeters to make a meter.

Host VO: How many meters equal one kilometer?

Feedback (correct): Yes, that’s the correct answer. Congratulations!

Incorrect (anticipated) No, remember, a kilometer is used to measure long distances. A meter is only about as long as a yardstick.

Incorrect (unanticipated) No, that’s incorrect. Keep trying.

Is a mile longer than a kilometer?

Feedback (correct): Yes, that’s the right answer. You’re doing a good job.
Incorrect (anticipated) No, that’s the wrong answer. A kilometer is shorter than a mile. It’s about as long as 2/3 of a mile.
April 24, 1989 - kw
Audio

Linear Measurement
Screen

Props, etc.

cm5: Linear quiz

Still of 8 inch pair of
needle-nosed pliers, a medium
sized screwdriver (about 1
foot), a handle for a drawer.
Blue dot question.

Props, etc.
bolt (Kate)
screwdriver (Kate)
handle (Kate)

2) How many inches are in a
foot?

3) Which of these
abbreviations means 2 feet and
7 inches?

Choices are:
2" 7'
2' 7"
7" 2'
7' 2"

4) Which pipe is longest?

Graphic of three lengths of
pipe, one labelled 2 feet, 2
inches, one labelled 24
inches, one labelled 25
inches. Blue dot question.

Lengths of pipe,
close in size,
labelled one in feet
and inches, the
others in all inches
(colored, brass,
other than silver).

5) You estimate a board is
about 2 feet long. Which
measuring tool is most
appropriate for finding the
exact length of this board?

Graphic. Blue dot question.

5) How much is 4
feet, 10 inches in
inches? Number bar
question.
Text screen.
April 24, 1989 - kw
Audio

Linear Measurement

Text screen.

Props, etc.

Screen

1m:29

Host VO:
6) How much is 35 inches in feet and inches?

7) You estimate a bolt is about 4 inches long. Which measuring tool is most appropriate to use for measuring this bolt?

8) Where should you start measuring the length of the bolt?

9) What is the length of this bolt?

10) What is the length of this piece of molding?

11) What metric unit is about the same as a yard?

12) What metric unit is about the same as 2/3 of a mile?
MEASUREMENT GEOMETRY SCRIPT

HOST: Frequently, at work, scale drawings are used to show the size of something that is really much bigger. Maps are one kind of scale drawing. Blueprints like the ones the architect used when he remodelled the restaurant are another — very detailed — kind of scale drawing. I picked these scale drawings up yesterday when I went to look for a new apartment. They call these floorplans. They're a lot like a blueprint. They show the size of the rooms. But they're not as detailed as a builder's blueprint. Some scale drawings — like this floorplan — don't actually have the dimensions written on them. They use a "key" instead.

NOTE: AT THIS POINT, WE COULD JUMP OVER ALL OF THE LINES BETWEEN THE 2 SETS OF #### AND NOT DO ANYTHING USING KEYS SINCE IT IS NOT IN THE ASSESSMENT. HOWEVER, REALISTICALLY, THE KEY IS THE MORE COMMON WAY OF MARKING SCALE DRAWINGS AND OVER HALF OUR REVIEWERS FELT THAT THESE STUDENTS SHOULD BE ABLE TO READ SCALE DRAWINGS AND/OR MAPS.
This key shows how long the real thing is compared to how long it is on the drawing. On this floorplan, the key says 1 inch = 2 feet. That means that if a wall is 1 inch long on the drawing, it's really 2 feet long. If it's 2 inches long on the drawing, it's really 4 feet long. Finding out how long something really is from a scale drawing is pretty easy -- once you know the rule. First, figure out how long the real thing would be for one inch on the drawing. Then, multiply that by the number of inches long it is on the drawing.

How long is the wall that is 6 inches long on this floorplan?

GRAPHIC OF FLOORPLAN ON LEFT WITH SCALE 1"= 2 ft. Window containing text of rule open: up on right side of screen as he spits "is the rule.

GRAPHIC OF FLOORPLAN ON LEFT WITH SCALE 1"=2' with one wall 6 inches long marked as being 6 inches long. RULE on screen from before. NUMBER BAR INPUT. (Note: instead of labeling these in inches, we could show a ruler lined up next to the thing in question. This is more like what you would really do.) Question plots below rule.

Touch the numbers on the bar to answer. When you're done, touch enter.
FEEDBACK:
FOR CORRECT RESPONSE: Yes, that's the right answer. You're doing a good job.
FOR INCORRECT UNPREDICTED RESPONSE: No, that's incorrect. Keep trying.
FOR INCORRECT PREDICTED RESPONSE: For 6, No, that's incorrect.
Remember each inch on this drawing stands for 2 feet, not 1 foot.

VO: Now you can use our rule to figure out how long the longest wall in the living room on this other floorplan is. The "key" says that one half inch equals 5 feet. How long is the wall that is 3 inches long on the floorplan.

FEEDBACK:
FOR CORRECT RESPONSE: Yes, that's the correct answer. Congratulations!
FOR INCORRECT UNPREDICTED RESPONSE: No, you got it wrong. Good luck next time.
FOR INCORRECT PREDICTED RESPONSE: For 15, No, that's incorrect.
Remember each 1/4 inch on this drawing stands for 5 feet. That means that each inch stands for 10 feet.

GRAPHIC OF FLOORPLAN WITH SCALE 1/2" = 5 FEET. Long wall of living room-dining room L is marked as being 3 inches long on the drawing. RULE remains on screen. Question plots below rule. NUMBER BAR INPUT.
VO (if we skip from beginning and don't do keys): But some -- like this floorplan....

VO (if we do key drawings): Some floor plans -- like this one --

VO HOST (continued): ...actually have at least some of the measurements written right on them. I really like these because you can read a measurement right from the drawing without having to figure anything out. So here I can look at this drawing and know that this wall is 20 feet long. Sometimes -- so that the drawing doesn't get too cluttered -- not all the measurements are written. But, there's a little rule that you can use when the drawing is made up of squares or rectangles -- like this one is.

SCREEN

GRAPHIC of floorplan of part of apartment described directly below. Arrow plots to point out 20 ft. long wall.

PROPS: None
VO: The rule is that on squares and rectangles the sides that are opposite each other are always the same length. Because of this rule, if you know one side, you also know the length of the side opposite it. The two walls marked in red here are opposite each other. And the two walls marked in yellow are opposite each other. However, a red wall can't be opposite a yellow wall, because the yellow and red walls touch each other. We already know that one of the red walls is 20 feet long.

VO: What is the length of the wall that has no number marked next to it.

FEEDBACK:
FOR CORRECT RESPONSE: Yes, your answer is correct. Keep up the good work.
FOR INCORRECT UNANTICIPATED RESPONSE: No, that's the wrong answer. Try again.
FOR INCORRECT ANTICIPATED RESPONSE: For 10 or 7, No, you got it wrong. You looked at the wall next to the wall marked 20 feet. You should have looked at the one across from it.
VO: Look at the drawing one more time. You probably notice that at one end of the living room, the wall is marked as being 10 feet long, but at the other end, it's marked as being only 7 feet long. At first this might seem to disagree with our rule. But, it really doesn't. It's just that there's a doorway separating the living room from the hallway. The actual wall down at floor level -- which is what a floorplan shows -- is only 7 feet long. The other 3 feet are taken up by the doorway. Of course, this doesn't change the size of the room. It's still 20 feet long and 10 feet wide.

VO: It's really useful to know how to read scale drawings like these. When we remodelled the restaurant a few months ago, I carefully made a scale drawing of the dining room. Then, when we needed to figure out how much carpeting, paint, wallpaper and molding to order, we just looked at the drawing. That way, we didn't have to measure again each time we ordered something.
AUDIO

VO: When we needed to figure out how much new baseboard molding to order to go around the whole dining room, we could look at our drawing and just add up the lengths of the walls. We didn’t have to worry about the size of the doorways or anything because there wasn’t any baseboard molding in the doorways.

VO: How much baseboard molding was needed for the dining room?

SCREEN

GRAPHIC OF RESTAURANT DINING ROOM ON LEFT 30 FEET LONG AND 15 FEET WIDE with 2 doorways - 1 to kitchen 6 feet wide and 1 customer entrance 5 feet wide on adjacent walls.

PROPS, ETC.

PROPS: None

FEEDBACK:

FOR CORRECT RESPONSE: Yes, you got it right. Good job!

FOR INCORRECT UNANTICIPATED RESPONSE: No, that’s the wrong answer. Try again.

FOR INCORRECT ANTICIPATED RESPONSE: If they answer 90 feet, No, your answer is incorrect. Remember they didn’t need baseboard molding in the doorways.

SAME GRAPHIC AS IMMEDIATELY ABOVE. Question plots on right. NUMBER BAR INPUT.
VO: When I wanted to order the wallpaper border that goes up near the ceiling, at first I thought that I'd need the same length of that as I needed of the baseboard molding. Luckily, my cook's helper Marcy realized that the doorways don't go all the way up to the ceiling, and that I really needed to order enough to go around the whole room.

VO: How much of the wallpaper border was needed for the dining room?

FEEDBACK:
FOR CORRECT RESPONSE: Yes, your answer is correct. Keep up the good work.
FOR INCORRECT UNANTICIPATED RESPONSE: No, that's incorrect. Keep trying.
FOR INCORRECT ANTICIPATED RESPONSE: If they answer 79 feet, No, that's the wrong answer. Remember, the doorways don't go all the way to the ceiling. They needed enough to go around the whole room -- including above the doorways.

HOST ON SCREEN. Holding a sample of the wallpaper border they used in the dining room. Standing near a doorway and spreading out a short section of the border above the doorway. Gesturing to indicate the perimeter of the room at ceiling level.

GRAPHIC OF RESTAURANT DINING ROOM FROM BEFORE. Question plots on right. NUMBER BAR INPUT
April 12, 1989 - ER

VO: After we figured out how many feet of the wallpaper we needed, we still had to figure out how many rolls to order. Each of the rolls was 30 feet long. So, when we figured out how many rolls to order, we had to find out how many 30 foot lengths there are in 90 feet. To do this I just divided 30 into 90.

VO: But you could also use my repeated subtraction method. It works like this. I begin by subtracting 30 from 90 -- like this. I'm left with 60 -- which is more than 30 -- so I can subtract 30 again. Then, I'm left with 30 -- so I can subtract 20 again. Then I end up with 0, so I can't subtract 30 again. Finally, I just count up the number of times that I subtracted. One, two, three. I subtracted 3 times. That means that there are 3 whole 30 foot long rolls of wallpaper border needed.

VO: How many 25 foot rolls of the wallpaper border were needed for the waiting room if 150 feet were needed altogether?

SCREEN

GRAPHIC OF THE WALLPAPER ROLL WITH 30 FEET WRITTEN ON IT ON LEFT.

Following text plots on right as it is mentioned: 90 feet of wallpaper border were needed. Each roll was 30 feet long. To find the answer you can divide

GRAPHIC OF NEW WALLPAPER BORDER ROLL WITH 25 FEET WRITTEN ON IT ON LEFT. Text from before remains. Then this text plots below: Or use repeated subtraction.

PROPS, ETC.

PROPS: None
FEEDBACK:
FOR CORRECT RESPONSE: Yes, that’s the correct answer.
FOR INCORRECT UNANTICIPATED RESPONSE: No, your answer is incorrect. Keep trying.
FOR INCORRECT ANTICIPATED RESPONSE:
If they answer 5 rolls, No, that’s incorrect. The wallpaper used in the waiting room only had 25 feet on each roll.
If they answer 25, No, that’s incorrect. 2E rolls would be 625 feet. They only needed 150 feet.

VO: When I was ready to order carpet for the dining room, the first thing I did was figure out how much to order. What I really needed to know was how much floor had to be covered. Since I had my drawing -- that had the length and width of the room in feet on it -- I figured it out from that. Doing it was easy because I remembered the rule for figuring out surface area. The rule is that to find the area of any rectangle, you just multiply its length by its width.
This gives a measurement in square feet. A square foot is just a square that is 1 foot long on each side. I could have drawn lines on my diagram like this and then counted the little squares. But that would have taken a very long time. It's much easier just to use the rule to figure out how many square feet there are in an area.

How many square feet are there in the dining room?
FEEDBACK:
FOR CORRECT RESPONSE: Yes, your answer is correct.
FOR INCORRECT UNANTICIPATED RESPONSE: No, that's the wrong answer. Try again.
FOR INCORRECT ANTICIPATED RESPONSE: If they answer 45 square feet, No, that's incorrect. You're multiplying 15 times 30, not 15 times 3. If they answer 90 or 79, No, that's incorrect. You're trying to find the number of square feet in the room, not the distance around. You need to multiply its length by its width. If they answer an answer which indicates they used a partial wall in their multiplication, No, that's incorrect. You need to use the full length and full width of the room when you multiply -- not the lengths of the walls that have doorways. The carpet will also have to go in front of the doorways.
VO: Actually the carpet was sold in square yards -- not in square feet. So, we needed to find the number of square yards that is the same as 450 square feet. Ben, one of my waiters, thought that -- since there are 3 feet in a yard -- there are also 3 square feet in a square yard. But I showed him that that wouldn’t work by drawing a little sketch of a square yard. Since each side is 1 yard long, then each side is also 3 feet long. So, there are actually 9 square feet in each square yard.

VO: Here we wanted to change our measurement from a smaller unit to a larger unit -- that is square feet to square yards. A lot of people have a hard time remembering whether to multiply or divide to do this. What I always tell my employees is: If you are changing a measurement from smaller units -- like square feet -- to larger units -- like square yards, you will have fewer of the larger unit. It makes sense then that you should divide. We know that there are 9 square feet in a square yard. So we just divide 9 into 450 to find the number of square yards. Of course, a lot of people have trouble with division.
VO: So, for a small number, you can always use my repeated subtraction substitute for division. But, for a large number like this -- if someone doesn’t feel comfortable with long division -- I recommend a calculator.

VO: But, for a fairly small number -- like say 45 square feet -- I show them my substitute for division -- I call it repeated subtraction. It works like this. Say I wanted to change 45 square feet into square yards. I know that there are 9 square feet in each square yard, so I begin by subtracting 9 from 45 -- like this. I’m left with 36 -- which is more than 9 -- so I can subtract 9 again. Then, I’m left with 27 -- so I can subtract 9 again. I keep doing this until I end up with a number less than 9. Here I end up with 0, so I can’t subtract 9 again. Then, I just count up the number of times that I subtracted. One, two, three, four, five. I subtracted 5 times. That means that there are 5 whole square yards in 45 square feet.
VO: How many square yards of carpet did we need to order to cover the coatroom floor. The area of the coatroom is 72 square feet.

FEEDBACK:
FOR CORRECT RESPONSE: Yes, that’s the right answer. You’re doing a good job.
FOR INCORRECT UNANTICIPATED RESPONSE: No, that’s incorrect. Try again.
FOR INCORRECT ANTICIPATED RESPONSE: If they answer 648, No, your answer is incorrect. You multiplied by 9.
If 04, No, your answer is incorrect. You divided by 3.

1) NARRATOR: How long is the wall that is 5 inches long on this floorplan?

2) NARRATOR: How long is the side of the fence that is 4 inches long on the drawing?
3) NARRATOR: What is the length of the wall that has no length marked next to it.

4) NARRATOR: How much baseboard molding would you need to replace all the baseboards in this room?

5) NARRATOR: How much of the wallpaper border would you need to paper this room at ceiling level?

6) NARRATOR: How many 20 foot long rolls of wallpaper border would you need if you needed 120 feet altogether.

7) NARRATOR: How many square feet are there in this room?

8) NARRATOR: How many square yards of carpet would you need to cover the floor in a closet with an area of 54 square feet?
April 21, 1989

Host: We use capacity measurement all the time in our cooking here at the restaurant. You use it too, even though you might not be familiar with the word "capacity". If you've ever cooked, poured a glass of juice or bought a gallon of milk, you've worked with capacity measurement.

Capacity is the term we use when we're working with liquids, and solids you can pour.

-- it refers to how much of something a measure (a measuring cup or spoon) can hold.
April 21, 1989 - kw

Host VO: The cup is the most commonly used capacity measure in cooking. There are measures smaller and larger than a cup.

Let's look at measures smaller than a cup first.

The smallest whole measure we use is the teaspoon. A measuring teaspoon is about the same size as the spoon you use to stir your tea.

Screen

Graphic of cup (clear graduated cup) in the middle. Graphics of smaller measuring instruments (silver) plot above it (at "smaller"), and graphics of larger measuring instruments (blue), below it at words "larger". They are each labelled and they plot in this order: teaspoon, tablespoon, ounce (as 1/8th of cup) pint, quart, gallon.

Measures smaller than the cup get a box drawn around them which brightens then dims.

Graphics erase. Teaspoon graphic replots in the center of the screen. Maybe a breakfast table setting plots (place mat, flowers on the table), sun rising through a window. Or, maybe just setting, all in black and white except for spoon.
Host VO: Three teaspoons equal one tablespoon. A measuring tablespoon is about the same size as the bigger spoons you use for eating soup.

And two tablespoons equal one fluid ounce.

Finally, 8 fluid ounces equal one cup.
Host VO: These are the whole measures less than a cup in capacity. I remember how they fit together by saying "3-2-1 blastoff". Three teaspoons make a tablespoon; two tablespoons make an ounce. One ounce ... uh ... [more hurriedly]
Well, that's as far as that goes. It's not a perfect way to remember, it's just one way to remember. 3-2-1 blastoff. I've never forgotten it. The blastoff part is 8 ounces equal a cup. Eight is a lot more than just a few, right? And if you've got one of those glass measuring cups around, you can always read it from the markings, too.

Those are the measures less than a cup-- the teaspoon, Tablespoon and ounce.
Host VO: How many teaspoons equal one Tablespoon?

NARRATOR VO: Touch the spoon as many times as you need. When you're done, touch ENTER.

Feedback (3): Yes, that's the right answer. Congratulations!
Incorrect (2, 8): No, that's the wrong answer. Remember 3-2-1 blastoff.
Incorrect (unanticipated): No, that's the wrong answer. Try again.

Host VO: How many tablespoons equal one ounce?

NARRATOR VO: Touch the spoon as many times as you need. When you're done, touch ENTER.

Host VO: Feedback (8): Yes, you got it right. Good job!

How many ounces equal one cup?

Graphic screen. Blue dot question. Foils are 2, 3, 4.

NARRATOR VO: Touch the blue dot next to the correct answer.

Feedback (correct): Yes, that’s the right answer. You’re doing a good job. Incorrect (2 or 3): No, your answer is incorrect. Remember 3-2-1 blastoff. Incorrect: No, your answer is incorrect. Keep trying.
April 24, 1989 - kw

Audio

Host VO: Now let's look at the cup and measures greater than a cup -- they are the pint, the quart and the gallon.

A cup is 8 ounces. You've probably read this on the small milk cartons you get at school.

The next larger measure is the pint. Two cups equal one pint. This is the amount of milk you get in this slightly larger milk container, twice the size of the cup container.

Screen

Graphic screen. Screen of all the measuring instruments is replotted.

The cup and instruments greater than a cup get boxed and the box brightens.

Graphics erase. Clear cup plots, then equal sign plots, then milk carton graphic.

Equivalents will be done using milk cartons, since most kids are familiar with them from school lunches. Milk cartons are all clearly labelled and will be drawn to scale.

Green and glass cups erase. 2nd milk carton plots. Equal sign, 1 pint-sized milk carton.

Props, etc.
April 21, 1989 - kw

Audio

Host VO: Two pints equal one quart.

Finally, four quarts equal 1 gallon. We can buy milk in gallons, too.

I remember how these larger measures fit together this way: 2 plus 2 is 4. 2 cups are in a pint; 2 pints are in a quart; 4 quarts are in a gallon. See? 2 + 2 is 4.

How many cups equal one pint?

Screen

Pint of milk is replotted on the left, joined by a 2nd, equal sign, 1 quart.

4 quarts of milk in graphics plot, equals, gallon of milk.

2 + 2 = 4 is at the top of the screen. Then graphics plot illustrating the relationships. Two cups = pint; 2 pints = quart; 4 quarts = gallon.

Repetitive touches question. Milk carton graphic to left of question.

Props, etc.

Host VO: Feedback (correct): Yes, that’s the right answer. Congratulations!
Incorrect (for 4): No, that’s the wrong answer. Remember 2+2=4.
Incorrect (unanticipated): No, that’s the wrong answer. Try again.
Host VO: How many pints equal one quart?

Feedback (2): Yes, that’s the right answer. You’re doing a good job.
Incorrect: No, your answer is incorrect.
Remember, 2+2=4.

How many quarts equal one gallon?

Feedback (4): Yes, you got it right. Good job!
Incorrect: No, you got it wrong. Remember 2+2=4.

Once you know these capacity basics, it’s not hard to figure out other equivalencies.
Host VO: Suppose, for example, you have a pint measuring glass, and you need a gallon of chicken broth for some soup you're making.

You recall that there are two pints in a quart, and four quarts in a gallon.

To find how many pints a gallon contains, then, you multiply the 2 pints in a quart by the 4 quarts in a gallon. Two times 4 is 8, so you get 8 pints equals 1 gallon.

How many **ounces** are in a **quart**?

NARRATOR VO: Touch the numbers on the bar to answer. When you're done, touch ENTER.
Host VO: Feedback (32):
Yes, your answer is correct. Keep up the good work.
Incorrect (8, 16): No, that's incorrect. There are 8 ounces in a cup, two cups in a pint and two pints in a quart.
Host: You have probably noticed there are different types of measuring instruments. The first kind is made of clear plastic or glass and marked with different quantities on its side. The other kind is made of plastic or metal and marked with just one amount. Let's look at a glass measuring cup first.

Host VO: Glass measuring cups are used for liquids -- milk, molasses, or maple syrup. The most common ones measure one cup, one pint or one quart.

Host VO: They can be used to measure any amount up to their capacity -- you just look at the markings on the side. It's best to look through the glass at eye-level rather than from above, so you can look right at the marking and get an accurate measurement.

Motion Host at counter with a 1-cup clear glass measuring cup, a set of measuring spoons and a set of 1/4, 1/3, 1/2 and 1 cup plastic cups (Elaine's green ones). Host points out each to camera.

1-cup graduated measuring cup
set of green plastic cup measurers
set of measuring spoons

Graphic of glass measuring cup on a counter or some sort of surface.

Same graphic, now filled with liquid to half its capacity. Head (profile, or eye) appears with dashed line from the eye to the top of the liquid.
April 24, 1989 - kw
Audio

VO: measure.

Host VO: These other cups and spoons have just one measure. They are used to measure dry things like flour and sugar and very thick liquids like cottage cheese or yogurt.

They usually come in sets, cups with one fourth, one third, one half and one cup measurements, and spoons with 1/4 teaspoon, 1/2 teaspoon, 1 teaspoon, and 1 Tablespoon. To use these measures, you fill them up to the top and then run a knife across the top to get just the right amount. The reason these measuring tools come in 1/4 and 1/2 sizes is that recipes use those measurements a lot.

Which of these cups is most appropriate for measuring 1 cup of cream?

1 cup glass graduated container and 1 cup plastic, non-graduated.
Host VO: Feedback (glass): Yes, your answer is correct. Keep up the good work.
Incorrect (green): No, that measure is used for solids and thick liquids.

Which of these cups is most appropriate for measuring 1 cup of graham cracker crumbs?

Feedback (green): Yes, you got it right. Good job!
Incorrect (clear): No, that measure is used for liquids.

Which of these cups is most appropriate for measuring 1 cup of cottage cheese?

Feedback (green): Yes, that’s the correct answer. Congratulations!
Incorrect (clear): No, your answer is incorrect.
Host VO: Choosing a measuring cup is easy once you know how. You already know that the glass cups are for liquids and the other cups for solids and very thick liquids. Generally, you'll want to choose just one -- it just saves dishwashing time.

This is the rule for choosing which to use. Choose the one that will need to be filled the fewest times, but will come out evenly to the amount you need.

For example, suppose you need to measure three-fourths of a cup of sugar. If you choose the 1 cup measure and don't fill it full, you won't get an accurate measure. If you choose the 1/2 cup measure, you'll have to use the 1/4 cup measure, too. If you choose the 1/4 cup measure, and fill it 3 times, you will get

Audio Screen Props, etc.

- Graphic of set of "single-measure" ie non-graduated measuring cups.
- Rule plots on screen: Choose the one that you can fill - the fewest times and - will come out evenly.
- Graphics screen (recipe with line for 3/4 cup sugar highlighted) and measuring cups. 1 cup measure, filled not full, x'd out. 1/2 cup measure, joined by 1/4 cup measure, x'd out. 1/4 cup measure, filled, plotted three times, box around it. Maybe arrow or word "Yes!" by it.
April 21, 1989 - kw

Audio

Host VO:
an accurate measurement
and only use one of the
cups.

Now you try one. Which
cup is most appropriate
to use to measure 3 cups
of flour?

Feedback: Yes, that’s the
right answer. You’re
doing a good job.
Incorrect (1/2 cup, 1/3
cup, 1/4 cup): No, that’s
incorrect. You want the
cup that you’ll have to
fill the fewest times.

Host VO: Which cup is
most appropriate to use
for measuring 1 and 1/2
cups of oats?

Feedback: Yes, you got
it right. Good job!
Incorrect (1 cup, 1/3
cup): No, your answer is
incorrect. You want a cup
that will give you
exactly the measure you
need.
Incorrect (1/4 cup): No,
your answer is incorrect.
Host VO: You will have to fill that cup many more times than you need.

Which cup is most appropriate to use to measure two-thirds of a cup of brown sugar?

Feedback: Yes, that's the correct answer. Congratulations!
Incorrect (1 cup, 1/2 cup, 1/4 cup): No, you got it wrong. You want a cup that will give you exactly the measure you need.

Host VO: For smaller amounts of both liquids and solids, we usually use teaspoons and tablespoons to measure. Frequently, these come in sets that include the teaspoon and tablespoon, and also 1/2 teaspoon and 1/4 teaspoon. The rule for choosing which to use is the same. Choose the
Host VO:
one that will need to be
filled the fewest times
but will come out evenly
to the amount you need.

Which spoon is most
appropriate to use to
measure 2 Tablespoons of
baking powder?

Feedback: Yes, you got
it right. Good job!
Incorrect (any teaspoon
measure): No, your answer
is incorrect. You want
the spoon you will have
to fill the fewest times.

Which spoon is most
appropriate to use to
measure 3/4 teaspoon of
salt?

Feedback: Yes, your
answer is correct. Keep
up the good job!
Incorrect (1 tablespoon,
1 and 1/2 teaspoons): No,
that's the wrong answer.
You want a spoon that
will give you exactly the
measure you need.
Host VO: Which spoon is most appropriate to use to measure 2 teaspoons of vanilla?

Feedback (teaspoon):
Yes, you got it right. Good job!

Incorrect (Tablespoon):
No, that's incorrect. You want a spoon that will give you exactly the measure you need.

Incorrect (1/2 and 1/4 teaspoon): No, that's incorrect. You want the spoon you will have to fill the fewest times.

Host VO: Sometimes, it may happen that you don’t have the cup you would normally choose to use. Say, you want the 1 cup measure and it isn’t available. You will have to find a substitute.

For instance, assume you need to measure 2 teaspoons of vanilla, but have no one-teaspoon measure. You could use the 1/2 teaspoon measure and fill it 4 times,
April 21, 1989 - kw

Audio

Host VO:
since two halves make a whole.

Host VO: Suppose the 1-cup measure is missing. Which cup is most appropriate to use to measure 3 cups of flour?

Feedback (1/2 cup): Yes, that's the right answer. You're doing a good job.
Incorrect (1/3, 1/4 cup): No, that's incorrect. You want the spoon you will have to fill the fewest times.

Suppose the half cup measure is missing. Which cup is most appropriate to use to measure 1 1/2 cups of oats?

Feedback (1/4 cup): Yes, that's the correct answer. Congratulations!
Incorrect (1, 1/3 cup): No, you got it wrong. You want a spoon that will give you exactly the measure you need.
Host VO: Suppose the tablespoon measure is missing. Which spoon is most appropriate to use to measure 2 tablespoons of baking powder?

Feedback (teaspoon): Yes, you got it right. Good job!
Incorrect (1/2, 1/4 teaspoons): No, you got it wrong. You want the spoon you will have to fill the fewest times.

Host VO: Once you have chosen a measuring instrument, you need to fill it the right number of times to get the quantity your recipe calls for.

Host VO: What you do is count up by the amount of the measuring instrument until you get the quantity you want.
Host VO: For instance, this recipe calls for 3 cups of flour. We select from the set the 1 cup measure. Since we have whole cups to count, we count 1, 2, 3, up to 3 cups. When we get to 3, we’re done.

How many times should you fill this cup to measure 2 cups of flour?

NARRATOR VO: Touch the cup as many times as you need. When you’re done, touch ENTER.

Host VO: Feedback: Yes, your answer is correct. Keep up the good work. Incorrect (anticipated): No, that’s the wrong answer. Remember, to count as you measure.

Host VO: Suppose the only measure we had was the 1/4 cup, and we needed 1 and 1/4 cups of flour. We’d fill the one-fourth cup and count as we Graphics are appearing as the fourth cups are voiced. When the fourth fourth appears. It is boxed and replaced by a one cup measure. Then
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Audio

Host VO:

measure, one fourth, 2
fourths, 3 fourths, 4
fourths. When we get to
the fraction that has the
same number on top as on
the bottom, we have one
whole. So four-fourths
of a cup is one cup.
Then we just add one more
fourth to our one, and
that's one and one
fourth, the amount we
wanted.

How many times should we
fill this cup to measure
two-thirds of a cup of
brown sugar?

Feedback (2): Yes, you
got it right. Good job!
Incorrect (anticipated):
No, that's the wrong
answer. Remember to
count by the measure of
the cup you're using.

Host VO: How many times
should we fill this cup
to measure 1 and 1/2 cups
of oats?

the fifth fourth appears.

Graphic screen. Multiple
touch question. Graphic
of 1/3 cup.

Graphic of 1/2 cup.
Multiple touch question.
Host VO: Feedback (3):
Yes, your answer is
correct. Keep up the
good work.
Incorrect (anticipated):
No, that's the wrong
answer. Remember to
count by the measure of
the cup you're using.

How many times should we
fill this cup to measure
1 and 1/2 cups oats?

Feedback (6): Yes, you
got it right. Good job!
Incorrect (anticipated):
No, you got it wrong.
Remember to count by the measure of the cup you're using.

We follow the same steps
using measuring spoons.
We select a spoon and
count up by the measure
of that spoon until we
get the quantity we want.
Host VO: For instance, this recipe calls for 2 tablespoons of wheat germ. We select from the set the 1 tablespoon measure. Since we have 2 tablespoons to measure, we count 1, 2. When we get to 2, we're done.

How many times should we fill this spoon to measure 2 tablespoons of wheat germ?

Feedback: Yes, your answer is correct. Keep up the good work.
Incorrect (anticipated): No, you got it wrong. Remember to count by the measure of the spoon you’re using.

How many times should we fill this spoon to measure 2 teaspoons of vanilla?

Feedback: Yes, that’s the correct answer. Congratulations!
Incorrect (anticipated):
Host VO:
No, your answer is incorrect. Remember to count by the measure of the spoon you're using.
Host: Earlier, when we were talking about ounces and cups, we introduced this measuring cup with marks on it. It's sometimes called a graduated measuring cup. Let's take some time to look at it more closely.

Host VO: You'll notice it has ounces marked in the middle, and fractions of a cup marked on either side. This is because sometimes recipes call for 1/2 cup, and other times, for four ounces. As you can see, the 4 ounces and 1/2 cup are marked by the same line. That's because half of a cup is the same as 4 ounces.

And look at three-fourths of a cup and 6 ounces. Again, the same line. So three-fourths of a cup is the same as 6 ounces.

How many ounces are there in one fourth of a cup?

Motion  Host choosing the glass measure from among the other measures and setting it on counter, then to

CU of graduated glass measure

Still of glass measure, showing both markings; arrows draw attention to 1/2 cup v. 4 ounces.

Same still. Another arrow drawing attention to single marking.

Same still. Number bar question. Arrows removed.
Host VO: Feedback: Yes, your answer is correct. Keep up the good work. Incorrect (anticipated, other than 2): No, that's incorrect. Always look closely at the marks on the glass.

Host VO: Although most of the lines are marked, some are not. That's because the numbers would be crowded and difficult to read, if all the measures were written. Here, the line between 4 and 6 ounces is not labelled. Because there is one line unlabelled, and one number missing, we know the line marks 5 ounces.

How many ounces are shown by this line?

Feedback (3): Yes, your answer is correct. Keep up the good work. Incorrect (anticipated, other than 3): No, that's incorrect. Always look closely at the marks on the cup.
Host VO: When you are using a measuring cup like this, you will try to get as close to the line for the amount in the recipe as you can. So, if the recipe says you need 4 ounces, you keep your eye on the ounce measurements as you pour into the cup.

[NO AUDIO, JUST DEMO]

Host VO: Are there 4 ounces of juice in this cup?

Feedback: Yes, that's the correct answer. Congratulations!
Incorrect (anticipated): No, your answer is incorrect. The top of this juice does not make it to the 4 ounce mark.
Host VO: Sometimes, you may just want to know how much of something you have. For instance, you might want to compare what you have with what you need for a recipe. In this case, you would pour the entire amount into the cup.

It may come out right on a line of the measuring cup, but usually it will come close enough to a line to let you know if you have enough.

I need two-thirds of a cup. So I will look at the one-third and two-thirds cup scale. If my recipe had given a number of ounces, I'd look at the ounces scale.

If the recipe had said a half-cup, I'd have looked at the 1/4, 1/2, 3/4 scale.

Host VO: I need 7 ounces of apple juice. Do I have enough?
Feedback (no): Yes, you got it right. Good job!
Incorrect (yes): No, that’s the wrong answer. Always look at the line closest to the top of the thing you’re measuring.

Host VO: I need 1/4 cup of lemon juice. Do I have enough?

Feedback (yes): Yes, your answer is correct. Keep up the good work.
Incorrect (no): No, that’s incorrect. Always look at the line closest to the top of the thing you’re measuring.
Host VO: Cookbooks can give you ideas for things you can make for yourself and your friends. Let's take a look at a recipe, and get an idea of how capacity measurement is used in recipes.

Recipes are created with a number of people to serve, 4, 8, or 12. If you have more people, or fewer people to cook for, you can change the recipe to fit your needs.

Here's one of my favorite recipes. How many people is it intended to serve?

NARRATOR VO: Touch the recipe in the correct place.

Spicy Pork Chops
(Serves 4)

4 pork chops
2 teaspoons vegetable oil
1 cup chopped onions
1/2 cup barbecue sauce
2/3 cup chopped green pepper
1/2 teaspoon salt
3/4 teaspoon paprika
Host VO: Feedback: Yes, you got it right. Good job!
Incorrect (anticipated):
No, that's incorrect. The number of servings is usually given at the beginning or end of a recipe.

Host VO: Suppose you are having a dinner party and want to make this dish for 8 people, instead of 4. Since 8 is twice as much as 4, you would use twice as much of each ingredient to make 8 servings.

How many pork chops would you need for 8 people?

Brown pork chops in oil, in large frying pan. Add onions ... etc.

Graphic remains on left of screen for duration of this unit.

Graphic screen. Recipe for 4 moves to left of screen. Column for "8 people" appears on right with the measuring units and ingredients filled in but amounts left blank.

Graphic screen. Number bar question. Line for pork chops is highlighted. As student fills spaces in, the correct amounts will appear in the blanks.
Host VO: Feedback: Yes, you got it right. Good job!
Incorrect (for 32): No, that's eight times the recipe. You want to make 8 servings.
Feedback: Yes, that's the correct answer. Congratulations!
Incorrect (for 4):
That's the wrong answer. That's eight times the recipe. You want to make 8 servings.
Suppose you were making the recipe for 12 people rather than 4 or 8. You would need 3 times as much of each ingredient in the recipe.
How much barbecue sauce would you need for 12 people?
Host VO: Feedback (1-1/2 cups): Yes, your answer is correct. Keep up the good work.
Incorrect (for rest):
No, that's the wrong answer. You want 3 times the original recipe.

How much green pepper would you need for 12 people?

Feedback (2): Yes, that's the correct answer. Congratulations!
Incorrect (for rest):
No, you got it wrong. You want 3 times the original recipe.

To make fewer servings than the recipe is for, we need to reduce the amount of each ingredient we use.

Graphic screen. Blue dot question. Foils are 1 cup, 3 cups, 8 cups.

Graphic screen. Recipe for 4 reappears on left of screen. On right of screen is template of recipe and words "For 2".
Host VO: Let's say you want to make the pork chops for only 2 people, just you and a friend. Since 2 is half of 4, you need half as much of each ingredient.

How many pork chops would you need for 2 people?

Feedback (2): Yes, your answer is correct. Keep up the good work.
Incorrect (for rest):
No, your answer is incorrect. You want just half as much of each ingredient to make half the number of servings.

Host VO: How much green pepper would you need for 2 people?

Feedback: Yes, you got it right. Good job!
Incorrect (anticipated):
No, that's incorrect.
Host VO: You want just half as much of each ingredient to make half the number of servings.

Finally, suppose we wanted to make the recipe for one. Since 1 person is one-fourth as many as four, we would use only one-fourth as much of each ingredient.

To find one fourth of a recipe, first figure out what half of it would be, and then figure out what half that amount would be. That’s one-fourth.

Host VO: How much vegetable oil would you need for 1 person?

Graphic of recipe remains on screen. On right, at top, is graphic of a circle. Then cut in half, then cut halves in quarters and color the quarter circle blue. Then have the rest of the circle appear around it to show it is one fourth the whole circle?
Host VO: Feedback: Yes, that's the correct answer. Congratulations! Incorrect (anticipated): No, that's the wrong answer. You want just one-fourth as much of each ingredient to make one-fourth the number of servings.
Host VO: In many countries people don't use all these different units to measure capacity. About now, you probably wish you lived in one of those countries. It's quite likely that we'll be using metric capacity measurement more in the future, so you should know a little bit about it. The most common unit in metric capacity is the liter.

You've probably seen the word "liter" before. Most of our soft drinks are now sold in liters. The larger bottles contain 2 or even three liters.

Graphic screen. With units of traditional capacity system on left. Word liter plots on right as mentioned.

Graphics screen. Soda bottles with labels "1 liter" and "2 liters".
Host VO:
You don't really need to be able to change from one system to another. But, there is one rough estimate that's handy to keep in mind. **One liter is about the same as one quart.**

About how many liters equal one quart?

Host VO: Feedback (4): Yes, that's the right answer. You're doing a good job.
Incorrect (for 10): No, that's the wrong answer. Try again.
Incorrect (for 1 and 2): No, that's the wrong answer. A liter is about the same as a quart. Think of how many **quarts** there are in one gallon.
Host VO:
How many teaspoons equal one Tablespoon?
Graphic, teaspoons times \( ? = 1 \) Tablespoon. Touch the object many times.

How many quarts equal one gallon?
Graphic, quarts times \( ? = 1 \) gallon. Touch the object many times.

How many cups equal one quart?
Graphic, cups times \( ? = 1 \) quart. Below, on screen, is 2 cups=1 pint and 2 pints=1 quart. Touch the object many times.

How many ounces equal one quart?
Graphic screen. Number bar question. Graphic, ounces times \( ? = 1 \) quart. Below, on screen, is 8 ounces=1 cup and 4 cups=1 quart.

Which cup is most appropriate to use to measure 1-1/2 cups of brown sugar?
Host VO:
Which cup is most appropriate to use to measure three-fourths of a cup of oats?
Which spoon is most appropriate to use to measure 1 and 1/2 teaspoons of orange juice?
Suppose the one cup measure was missing. Which cup is most appropriate to measure 4 cups of sugar?
Suppose your measuring tablespoon was missing. Which spoon is most appropriate to use to measure 2 Tablespoons of milk?
How many times should you fill this cup to measure 1 and 1/2 cups of brown sugar?
How many times should you fill this cup to measure 3/4 cups of oats?

Graphics: set of 3 cup measures: 1/2, 1/3 and 1/4 cup. Blue dot question.
Graphic screen. 1/2 cup measure. Touch object many times.
Graphic screen. 1/4 cup measure. Touch object many times.
Host VO:
We need two-thirds of a cup of apple juice. Do we have enough?

How many people is this recipe intended to serve?

How many quarts of chicken broth are needed to serve 12 people?

How many teaspoons of salt are needed to serve 12 people?

How much chicken broth is needed to serve 3 people?

How much salt is needed to serve 3 people?

Still of cup. Blue dot (yes/no). Exactly 1/3 cup.

Graphic:
Chicken Rice Soup
(Serves 6)
2 quarts chicken broth
2 cups cooked chicken
2/3 cup brown rice
1/2 teaspoon salt
3/4 teaspoon parsley

Touch the place once.

Graphic screen. Number bar question.

Graphic screen. Number bar question.

Graphic screen. Blue dot question. Foils are 1 cup, 2 cups, 1 pint.

Graphic screen. Foils are 3/4 teaspoon, 1 teaspoon, 1 and 1/4 teaspoons.
Host VO:
About how many quarts of milk would it take to fill a 1 liter soda bottle?
Host: We use weight measurement all the time without really thinking a lot about it. When we need to move or carry something from one place to another, we unconsciously estimate how heavy it is.

Host VO: The most common unit we use to measure weight is the pound. These things weigh about 1 pound: steak, small bag of gourmet coffee, serving of salad. Off to one side are loaf of bread, a turkey or large chicken, a slice of cheese.

Which of these things weighs about 1 pound?

NARRATOR: Touch the blue dot next to the correct answer.

Host VO: Feedback (bread): Yes, you got it right. Good job! Incorrect (for cheese): No, that’s incorrect. The cheese is lighter than a pound.
Incorrect (for turkey): No, that's incorrect. The turkey is heavier than a pound.

Host: This turkey weighs about 15 pounds, many times the weight of the bread. The cheese weighs much less than the bread.

For things that weigh less than a pound, the unit we use to measure their weight is the ounce.

These things weigh about an ounce.

Host VO: Which of these things weighs about an ounce?

Feedback (chocolate): Yes, you got it right. Good job!
Incorrect (bagel): No, that's
[Host VO]:
incorrect. The bagel is too heavy. Incorrect (grape):
No, that's incorrect. The grape is too light.

Most things won't weigh exactly one pound or one ounce, but somewhere in between an ounce and a pound.

This weighs 3 pounds.

This weighs 4 ounces.

You probably know that people use abbreviations for words they spell often. The abbreviation for one pound is "L B period". For more than one pound, it's "L B S period".

We have an abbreviation for ounce, too. It is "O Z".

When something is weighed in pounds and ounces, we say the number of pounds first, since
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Audio

[Host VO]: Pounds are the larger unit. Then we say the number of ounces. This weighs 7 pounds, 18 ounces.

Each of these slices of cheese weighs one ounce. When we put 16 slices of this cheese together, we have a pound of cheese. Sixteen ounces are in a pound.

Sixteen slices, 16 ounces, 1 pound. All the same. There are 16 ounces in 1 pound.

Do these things weigh the same?

Feedback (no): Yes, your answer is correct. Keep up the good work. Incorrect (yes): No, that's incorrect. 1 pound is equal to 16 ounces.

Finally, the unit we use in measuring the weight of very heavy things is a ton. You've heard the expression "This

Graph of balance scale with block of cheese labelled "1 pound" on the left and slices of cheese standing up so there are 16 of them. Labelled "16 ounces" on the right.

Graphic of nuts marked 1 pound and nuts labelled 18 ounces on the other side with smaller balance scale in the back.

Blue dot (yes/no) question.

Graph of pyramid block, 3-dimensional, labelled 1 ton on the left and another labelled 2000 pounds on the right.
[Host VO]: Weighs a ton," right? One ton is the same as 2000 pounds.

Tons are used to weigh very heavy things, like cars and building materials.

Host: Most things we come across, though, we weigh in pounds, ounces, or a combination of pounds and ounces.

Suppose we were given a weight in pounds and ounces and we needed to figure out how many ounces we had altogether.

Like here. I know that we have 2 pounds, 3 ounces of potato salad. We need an ounce on each sandwich plate. So we need to know how many ounces we have altogether to know how many servings we have.

To do this, we need to find out how many ounces are in 2 pounds, and then add the remaining ounces to that.

Host takes out a pad of paper to do calculations on.

Note pad
Pen or pencil
Host VO: The first thing we do is remember there are 16 ounces in 1 pound.

Next, we write how many pounds we are changing to ounces, to get the measure of ounces in our pounds. We have 2 pounds, so we’ll multiply 16 times 2.

So that’s ... 32 ounces in 2 pounds.

Finally, we add the original number of ounces to this number. We have 3 ounces to add in.

That’s 35 ounces altogether.

Now you try one. You have 4 pounds, 1 ounce of potato salad. How many ounces do you have altogether?
NARRATOR VO: Touch the Numbers on the Bar to answer. When you're done, touch ENTER.

Host VO: Feedback (65): Yes, you got it right! Good job! Incorrect (anticipated, for 49, 41, 33 ounces): No, that's incorrect. There are 16 ounces in a pound. Multiply the number of pounds by 16. Then add the original number of ounces. Incorrect (unanticipated): No, that's incorrect. Keep trying.

Sometimes, you may know the number of ounces but need to change them to pounds and ounces.

When you are changing a measurement from smaller units -- like ounces -- to larger units -- like pounds, you will have fewer of the larger unit. It makes sense then that you should divide. We know that there are 16 ounces in a pound. So, here, we could divide 16 into 43 to find the plots.

2 pounds
16 ) 43
32
11 ounces

- Graphics screen, block of cheese on right labelled 43 ounces.
- Smaller to larger -- Divide plots on right.

Props, etc.
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Weight Measurement

Audio

number of pounds and ounces.

Of course, a lot of people have trouble with division.

So, for a small number, like this, you can always use my repeated subtraction substitute for division. 

Again, the first thing we need to do is remember there are 16 ounces in 1 pound. Then to change from ounces to pounds and ounces, we subtract 16 ounces (or 1 pound) at a time, until we have no more whole pounds. When we have less than 16 ounces, the number remaining is the number of ounces left over. If we get a zero, that means we have no extra ounces. We only have full pounds.

Here we are starting with 43 ounces. We ask, Do we have 16 ounces or more? We do, so we subtract 16 ounces.

We ask again, Do we have 16 ounces or more? Yes, so we subtract 16 again.
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Weight Measurement

Audio

Do we have 16 ounces or more?
No, we don't. So this number is our remaining number of ounces.

Host VO: Now we count the number of times we subtracted 16 ounces. One, two. That's 2 pounds. And we have 11 ounces remaining. 43 ounces is the same as 2 pounds, 11 ounces.

Now you try one. This weighs 29 ounces. How much is that in pounds and ounces?

NARRATOR VO: Touch the numbers on the bar to answer. The cursor will move automatically from pounds to ounces. When you're done, touch ENTER.

Host VO: Feedback (1 lb., 13 oz.): Yes, you got it right. Good job!
Incorrect (anticipateds: 2 lb., 9 oz.; 2 lb., 5 oz.; 3 lb., 7 oz.): No, that's incorrect. Remember, there are 16 ounces in a pound.

413
Audio

[Host V0]: Incorrect
(anticipated:
1 lb., 11 oz.
3 lb., 11 oz.): No, that's the wrong answer. Count how many times you subtracted 16.

Incorrect (unanticipated):
No, your answer is incorrect. Keep trying.
April 20, 1989 - kw

Weight Measurement

Audio

Host VO: Do one more. This weighs 38 ounces. How much is that in pounds and ounces?

Feedback: Yes, your answer is correct. Keep up the good work.
Incorrect (anticipated: 3 lb., 2 oz.; 3 lb., 8 oz.; 4 lb., 6 oz.): No, that's incorrect. Remember, there are 16 ounces in a pound.
Incorrect (anticipated: 1 lb., 6 oz., 3 lb., 6 oz.): No, that's the wrong answer. Count how many times you subtracted 16?
Host: An understanding of pounds and ounces and the relationship between them is very important for working with weight measurement. Now, let's look at the tools we use to measure weight -- scales.

There are different kinds of scales that are used for weighing different things. Digital scales tell you the measurement, so they're pretty easy to use.

Host VO: Other scales have a pointer which points to numbers or markings representing weights. You read this kind of scale by looking at where the pointer points.

Every scale has a "capacity", that is, a maximum weight that it can measure accurately without breaking. See
the capacity statement on this scale? It says:
Host VO: "Capacity: 10 ounces".
That means this scale can weigh 10 ounces and less. Things that might be weighed on this scale are fruit, candies or individual servings of any food.

Host VO: Your turn! What is the capacity of this scale?

Feedback (20 lbs.): Yes, that's the correct answer. Congratulations!
Incorrect (28 ounces foil): No, that's the wrong answer. This scale measures in pounds.
Always look carefully at the capacity on the face of the scale.
Incorrect (1 pound and 0 pounds): No, that's the wrong answer. Always look carefully at the capacity on the face of the scale.

Still of things that might be weighed on that scale on counter top.

Things that might be weighed on that scale, fruit, candy, small steak or pork chop, broccoli, potato

20-lb. scale
the scale.
Host VO: Things we might weigh on this scale are things that weigh 20/10 pounds or less, like an eggplant, a head of cauliflower or this chicken. turkey.

Host: Let's try this cauliflower on the 20/10 pound scale.... Yep, this is the right scale to weigh this on.

See? The pointer is in between the lowest and highest numbers on the scale.

Let's see what happens if we weigh something heavy on a scale meant for things that are lighter.

That's what I thought would happen. The cauliflower is too heavy for this 10-ounce scale.

You need to keep a few things in mind when you pick a scale. Let's say we wanted to weigh this turkey chicken eggplant cauliflower 20-lb. scale.

Screen

Still of things that weigh less than 20 pounds on counter top.

Cauliflower maxxes out 10-ounce scale.

Props, etc.

turkey chicken eggplant cauliflower 20-lb. scale

Motion Host puts it on the 20-pound scale.

CU of scale weighing cauliflower (doesn't necessarily have to show numbers, just where the needle is).

Motion Host takes cauliflower off scale and puts it on 10-ounce scale.

Cauliflower maxxes out 10-ounce scale.

MOTION full screen host standing... (as same as p. 4 of last act)

CU of eggplant and scales toward left 2/3s of screen.
April 20, 1989 - kw

Weight Measurement

Audio

[Host:] eggplant. There are steps you can take to help you choose the right scale.

Host VO: First: Estimate how much it weighs, generally speaking;
Two: Check the capacities of the scales you have;
Three: Compare them to the weight you've estimated and reject those with capacities less than the weight you've estimated;
Four: Ask if, practically speaking, you can weigh that item on that scale;
Five: Choose the best scale by choosing the one that exceeds the weight of the object by the smallest amount.

Host: First, you need to estimate, that is, make your best guess about how much it weighs. Estimating gets easier the more you do it. If you have a job where you're weighing things

Graphics, plots with host voice on right 2/3s:
1) Estimate the weight
2) Check capacities of scales
3) Compare estimate to capacities and rule out those too small
4) Ask, Is it practical?
5) Choose scale that exceeds your estimate by the smallest amount.

Motion [full screen]
Host standing behind counter with scales and eggplant in front. Tone of voice more confidential, less matter-of-fact as host gives second sentence.
[Host:] all day, it will become second nature to you to estimate weights, believe me.

I estimate that this eggplant weighs ... uh ... 2 pounds.

[Host VO: The next step is to check the capacities of the scales we have. I have these 3 scales. This one has a capacity of 10 ounces; this one, 10 pounds; and this one, 20 pounds.

Now, we need to compare our estimated weight to those capacities. The capacity of the scale should be larger than our estimate. So here that means we have to rule out

Motion Host bouncing eggplant up and down gently in hand, puts on counter next to scales. When s/he says 2 pounds, go to

Closeup and still on left 2/3s of screen. Text overlay on right 1/3 plots "Estimate".

Same still on left side. "Check capacity" plots. Arrows flash as capacities of scales are mentioned.

"Compare estimate to capacities" plots. An "X" overlays the 10-ounce scale.
April 20, 1989 - kw

Weight Measurement

Audio

Screen

Props, etc.

using the 10-ounce scale. But the capacity of these two scales is each larger than 2 pounds, so they are left.

Next, we look at the practicality of using the scales to weigh the item. Could we weigh this eggplant on each of these scales? Sure, that looks possible.

Host: Finally, we choose the best scale for the job by choosing the scale with the capacity closest to the weight we've estimated. Here, the 10-ounce scale is closest to our estimate, so we choose it. Are we ready to weigh this finally? Yes! Here goes.

I think you're ready to try choosing a scale. Let's see, just to get you started, I'll estimate this tomato weighs ... mmm ... 7 ounces.

"Practical?" plots.

Motion Host putting eggplant on 10-lb. scale. A successful weigh, showing the needle about in the middle of the scale. Then camera pulls back to include the host in the shot.

Motion Host to camera. Tomato, good size, about 6 or 7 ounces.

Picks up largish ripe tomato.
April 20, 1989 - kw

Weight Measurement

Audio

Screen

Props, etc.

Host VO: Which scale is better for weighing this tomato?

Still Tomato and three-
scales, blue-dotted, on
left two-thirds of
screen, hopefully with
their capacities showing
(else they'll be
overlaid). Tomato has
overlay label estimating
it weighs 7 ounces.
Rules remain on the
screen on the right one-
third of screen.

[Host VO: ]
Feedback (10-ounce):
Yes, that's the correct
answer. Congratulations!
Incorrect
(unanticipated): No, you
got it wrong. Good luck
next time.

Try another one. Let's
estimate this squash
weighs 4 pounds.

Still on left 2/3s with
squash replacing tomato,
again overlaid with
estimated weight.
Which of these scales

Should we rule out using
to weigh this squash?

Feedback (10-ounce):
Yes, your answer is
correct. Keep up the
good work.
Incorrect (10-lb., 20-lb.): No, that’s the wrong answer. That scale could weigh a 4-pound squash.

Which of these scales is better for weighing this squash?

Feedback (10-lb. scale):
Yes, that’s the right answer. You’re doing a good job!
Incorrect (20-lb.): No, that’s incorrect. You want to use choose the scale with the capacity closest to the weight you’ve estimated.

Host: Another situation we often run across when we’re preparing party platters for our customers is weighing out some amount of something -- say, 2 pounds of pasta salad. In this case, all we have to do to choose the right scale is the
last four steps. We don't bother estimating the weight of the salad, because we already know how much we want to measure out. So we choose the scale that is best for the weight we want to measure. This one—for 2 pounds.

Host VO: Let's say we have two scales available, our 10-pound scale and our 20-pound scale. We want 11 pounds of cheese for a party platter we're putting together. Which of the scales is better to use?

Feedback (20-lb.): Yes, your answer is correct. Keep up the good work.
Incorrect (10-lb.): No, that's incorrect. Remember the weight of the cheese has to be less than the capacity of the scale.

At "don't bother estimating," X plots over the first step, estimating.

gestures to 10-lb scale

Still of 2 scales and cheese. Blue do. question.
Host: So, now all we have left to learn about in weight measurement is reading scales and measuring out given amounts. Let's look at reading scales first.

As I said before, to read most scales you just look at the number the pointer points to.

This weighs 2 ounces.

Host VO: How many ounces does this weigh?

Feedback (9): Yes, you got it right. Good job!
Incorrect (unanticipated): No, that's incorrect. Always look carefully at the pointer and the number it's pointing to.
Incorrect

Feedback (9): Yes, you got it right. Good job!
Incorrect (unanticipated): No, that's incorrect. Always look carefully at the pointer and the number it's pointing to.
Incorrect

Host: On this scale, each whole number up to the scale's capacity is written on the face, so we just figure out what parts of the ounces are indicated by the small lines between the numbers.

Host VO: Here the scale is marked 0, 1, 2, 3, all the way up to 10. That means that each of the little lines here stands for a part of an ounce -- that is, a fraction of an ounce. To read a scale like this when the pointer is between 2 numbers is easy once you know the trick.

First, you need to find the end of the pointer. Here, it's between 5 and 6 ounces. Write down the smaller number as your

Motion Host on screen, closeup of face of 10-ounce scale. Host indicates with his finger the lines. Moves finger out of shot. To still.
[Host VO:]
whole number. Then count
the number of spaces
between the two numbers.
This is the number of
parts -- the bottom part
of your fraction. Write
that down too, with a
fraction bar above it.
Next, count the lines
between the smaller
number that you've
written down and the end
of the pointer. That's
the top of your fraction.
Write that down too.
This number is the
weight. So the weight
shown here is 5 and
three-fourths ounces.

Your turn now! What is
the weight shown by this
scale?

Feedback (14-3/4): Yes,
your answer is correct.
Keep up the good work!
Incorrect (for 15-3/4):
No, that's the wrong
answer. The smaller of
Audio

[Host VO:] the two numbers on each side of the pointer is the correct whole number for this measure. Incorrect (for 14-2/4 or 14-1/2): No, that's the wrong answer. Always count the lines between the whole number measure and the pointer for the top of your fraction.

Host VO: Do one more. What is the weight on this scale?

Feedback (3-2/4 and 3-1/2): Yes, you got it right. Good job! Incorrect (for 4-2/4 pounds): No, that's
incorrect. The smaller of the two numbers on each side of the pointer is the correct whole number for your measure. Incorrect (3-3/4 pounds): No, that's incorrect. Always count the lines between the whole number measure and the pointer for the top of your fraction.

Host VO: Sometimes the fraction part of a number can be written in a more familiar way. For instance, 2/4 would probably look more familiar to you if we wrote it 1/2. These two fractions mean the same thing, but people are likely to understand you more quickly if you say 1/2.

Host VO: There is one last relationship you should know between pounds and ounces, and this refers to parts of pounds. Sometimes, as we...
April 21, 1989 - kw

[Host VO:] just did, we weigh food in pounds and parts of pounds, instead of pounds and ounces. At the deli, people don't order 8 ounces of cheese, but a half pound of cheese. There are three fractions of pounds that are used often. They all come from the basic rule, 1 pound equals 16 ounces, but they are used so often it makes sense to memorize them.

A half-pound is the same as 8 ounces.

One-fourth of a pound is 4 ounces.

Three-fourths of a pound is 12 ounces.

Since these are important to remember it's worth practicing a bit. How many ounces equals one-half pound?

Feedback: Yes, that's
[Host VO:] the right answer. You’re doing a good job.
Incorrect: No, that’s the wrong answer.
Remember, 1 pound equals 16 ounces, so one-half pound will be one-half of 16 ounces.

How many ounces equals 1/4 pound?

Feedback: Yes, you got it right. Good job!
Incorrect: No, that’s incorrect. Remember, 1 pound equals 16 ounces, so one-fourth a pound will be one-fourth of 16 ounces.

How many ounces equals 3/4 pound?

Feedback: Yes, you got it right. Good job!
Incorrect (anticipated): No, you got it wrong. Remember, 1 pound equals 16 ounces, so three-fourths pound will be three-fourths of 16
Host VO: But, you know not all countries measure the weight of things in ounces, pounds and tons. In fact, in most places weight is measured in units of another system - the metric system. Its most common weight units are grams and kilograms. If you need to weigh something in grams or kilograms, you will use a scale which uses these units, so don't worry about changing between metric and our traditional system of weight measurement.

There are a couple of comparisons that are good to know between our system and the metric system.

First, a gram is a very light unit -- much lighter than even our ounce. In fact, it takes almost 500 grams to equal 1 pound on the other.
one pound.

[Host VO:] Kilograms -- on the other hand -- are heavier than one pound. It takes one thousand grams to equal one kilogram.

What you want to remember is that one kilogram weighs about two pounds.

About how many pounds equal 1 kilogram?

Feedback (2): Yes, that's the right answer. You're doing a good job.
Incorrect (for 5, 10): No, that's the wrong answer. Try again.
Incorrect (for 1): No, that's the wrong answer. A pound and a kilogram are not the same weight.

Graphics: Balance scale with 1000 grams on one side and 1 kilogram on the other.

Graphics: Balance scale with 2 pounds on one side and 1 kilogram on the other.

Text screen. Blue dot question. Foils are 1, 5, and 10.
April 20, 1989 - kw

Weight Measurement

Screen

Props, etc.

Host VO:
How many ounces are in a pound?

How many ounces are in 2 pounds, 14 ounces?

How many pounds and ounces are in 37 ounces?

How many pounds and ounces are in 32 ounces?

Host VO: What is the capacity of this scale?

Host VO: It is estimated this melon weighs about 3 pounds. Which of these scales would be best for weighing this melon?
April 20, 1989 - kw

Weight Measurement

Audio

Host VO: It is estimated that this cheese weighs 5 ounces. Which of these scales would be best to weigh it on?

Host VO: How much does this pineapple weigh?

How much does this pineapple weigh?

Host VO: How much does this head of lettuce weigh in pounds and parts of pounds?

Host VO: How much does this head of lettuce weigh in pounds and ounces?

About how many pounds is equal to one kilogram?

Screen

Still of scales. Blue dot question.

Still of scales. Blue dot question.

Still of scales. Blue dot question.

Still shows weight of 1-1/4 pounds. Foils are 1-1/2 pounds, 1/4 pounds. Blue dot question. Scale has every pound marked.

Same still as above. Number bar question.

April 12, 1989 - ER

TEMPERATURE SCRIPT

AUDIO

HOST: Around the restaurant we use a lot of thermometers. There are thermometers for cooking meat that tell us how hot the meat is in the center. And, there are special ones we use when we deep fat fry so we can make sure the oil doesn’t get too hot. Then there are the ones we use just to tell how warm it is inside and outside the restaurant -- like this one on the thermostat here and the one right outside the window (door). All of these -- just like the thermometer you use when you’re sick -- measure temperature in degrees Fahrenheit. That’s the scale that we still use most of the time in the United States.

SCREEN

MOTION HOST ON SCREEN: He is standing by the counter next to a kitchen carousel, which holds kitchen tools, including a deep fry thermometer. A small roast is sitting on the counter with a meat thermometer stuck in it. He pulls the deep fry thermometer out and clips it on the edge of a large pot containing hot oil (Note: This can actually be hot water with a little yellow food coloring). Then walks over to thermostat and points toward the thermometer outside the window as he mentions the outdoor thermometer.

PROPS, ETC.

PROPS: Meat thermometer (mercury), Deep fry thermometer (pointer type), Thermostat (pointer type), Outdoor thermometer (mercury).
There are several different types of thermometers. These two are pointer type thermometers. To read one of these, you just look at the end of the pointer — to the number it's aiming at. So, the thermometer on the thermostat is registering 68 degrees. (Note: This has to be a marked number. May change depending on available real thermostat on which graphic is modelled.) What temperature is the deep fry thermometer registering now?

NARRATOR: Touch the numbers on the bar to answer. When you're done, touch enter.

FEEDBACK:
FOR CORRECT RESPONSE: Yes, that's the correct answer. Congratulations!
FOR INCORRECT UNPREDICTED RESPONSE: No, you got it wrong. Good luck next time.
FOR INCORRECT PREDICTED RESPONSE: If + OR - 10 Degrees, No, that's incorrect. You're close, but the pointer is pointing directly toward a number marked on the thermometer.
Reading mercury thermometers isn't very much different. On these, you pay attention to the top of the mercury in the little glass tube. Usually, it has some color in it to make it easier to see. So, the temperature on this meat thermometer is 160 degrees. (Note: This may change depending on numbers marked on actual meat thermometer. Has to be a marked number.) What is the temperature outside?

FEEDBACK:
FOR CORRECT RESPONSE: Yes, that's the right answer. You're doing a good job.
FOR INCORRECT UNPREDICTED RESPONSE: No, that's incorrect. Keep trying.
FOR INCORRECT PREDICTED RESPONSE: If + OR - 5 Degrees and not pointing at a marked number, No, that's incorrect. You're close, but the top of the mercury is located at a number marked on the thermometer.
VO: You probably noticed on these thermometers, a small circle, that looks like a small letter "O" -- with a capital "F" period after it. This is the abbreviation for degrees fahrenheit. When you write an actual temperature you put this after the number -- like this. Notice that the degree sign isn't right on the line.

Which of these is the correct abbreviation for 75 degrees Fahrenheit?

NARRATOR: Touch the blue dot next to the correct answer.

FEEDBACK:
FOR CORRECT RESPONSE: Yes, that's the right answer. You're doing a good job.
FOR INCORRECT ANTICIPATED RESPONSE: The number goes first. Then the small circle. Finally, the capital F., period.
HOST: I really like these new digital thermometers. On this fever thermometer, the number on the display tells you exactly what the temperature is. I just bought this one to replace the old mercury one.

VO: One reason digital thermometers are becoming so popular is that it's not always that easy to tell what the temperature is when the pointer or the mercury isn't next to a marked number. Since thermometers are designed for all kinds of different purposes, some -- like this indoor thermometer -- only need to measure a fairly narrow temperature range -- from 50(?) degrees to 100(?) degrees. But this outdoor thermometer has to be able to measure temperatures all the way from 60 degrees below zero up to 120 degrees above zero.

MOTION HOST ON SCREEN: Walks over to put his new digital fever thermometer into the first aid cabinet. He holds the new one up as he mentions it. End with closeup of the digital thermometer showing the temperature clearly.

GRAPHIC: Still with mercury indoor thermometer or thermostat thermometer on right side registering 74 and outdoor thermometer on left side registering 74 degrees. Red arrows point at top and bottom numbers on both thermometers as they are mentioned and remain on the screen.

PROPS: Digital fever thermometer, First aid cabinet or box filled with miscellaneous first aid supplies.

PROPS: Outdoor thermometer and mercury indoor or thermostat thermometer
VO: Whenever there's a pretty wide range, there just isn't room to write all of the whole temperature numbers on the thermometer. Instead, there are usually little lines that stand for other temperatures. The problem most people have is figuring out exactly what each of these little marks stands for. On this outdoor thermometer, the numbers that are marked are more than one degree apart. That usually means that each of these little marks stands for a temperature that is at least one degree more than the one below. Usually the marks stand for 1, 2, or 5 degrees. To read a temperature that's not marked, you start by looking at the marked temperatures on either side of the mercury or pointer and make a good estimate of what each little mark stands for. Let's say you chose 5 here. Then, to check to see if your estimate was right, you can count by 5's from the smaller number to the larger number. If your counting matches the higher number when you come to it, you know that your estimate was correct. Let's try counting by 5's here. Starting at 60 -- since that's the nearest marked number below the top of the mercury.

SCREEN

STILL OF THE OUTDOOR MERCURY THERMOMETER ON LEFT HAND SIDE OF SCREEN FROM BEFORE REGISTERING 74 DEGREES. As the narrator speaks 1/2 screen window opens to cover other thermometer and the following plots on right hand side of screen.

If the marked numbers are more than one apart, each little line probably stands for 1, 2, or 5 degrees. Count by 1, 2, or 5 from the marked number below the actual temperature to the marked number above the temperature. If your counting matches the top number, you chose correctly. If your counting does not match the top number, choose again. When you have a match, count from the lower number to the top of the mercury or pointer -- THAT'S THE TEMPERATURE.

Arrows point to numbers on thermometer as mentioned.

PROPS, ETC.

PROPS: Outdoor mercury thermometer from above
Our counting and the higher number don't match. That means we need to choose another one of the common numbers - 1, 2, or 5. This time I’ll choose 2. 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80. It came out right this time. That means each mark stands for 2 degrees. Now all I have to do is count by 2 from the lower number to the top of the mercury. 60, 62, 64, 66, 68, 70, 72, 74, 74 -- This is the temperature.

VO: What is the temperature shown by this thermometer?

FEEDBACK:
FOR CORRECT RESPONSE: Yes, your answer is correct. Keep up the good work.
FOR INCORRECT UNPREDICTED RESPONSE: No, that’s the wrong answer. Try again.
FOR INCORRECT PREDICTED RESPONSE: If 84 degrees, No, you got it wrong. You’re counting by ones. If 100 degrees, No, you got it wrong. You’re counting by fives.
HOST: Try another one, this time with the deep fry thermometer. What is the temperature shown on the deep fry thermometer?

NARRATOR FEEDBACK:
FOR CORRECT RESPONSE: Yes, that’s the correct answer. Congratulations!
FOR INCORRECT UNPREDICTED RESPONSE: No, that’s incorrect. Keep trying.
FOR INCORRECT PREDICTED RESPONSE: If 278 degrees, No, that’s wrong. You’re counting by ones. If 281 degrees, No, that’s wrong. You’re counting by twos.

NOTE: ALL THERMOMETERS UP TO THIS POINT HAVE THEIR CELSIUS SCALES COVERED UP.
But you know, not all countries use the Fahrenheit temperature scale. Most of them measure temperature in degrees Celsius. We use it in the U.S. sometimes too, and in the future we may be using it more. So, a lot of the thermometers have both temperature scales on them, like this one. The inside is marked for Celsius. Notice the capital C after the degree sign. The outside is marked for Fahrenheit. With thermometers like this, you can read off the temperature in either Fahrenheit or Celsius degrees. As you can see, 50 degrees Fahrenheit is about the same as 10 degrees Celsius.

Of course the way that you find out what the degrees Celsius are when they aren't marked is just the same as it is for Fahrenheit. The trick is that even on the same thermometer, the little lines may stand for a different number of degrees on the two scales. So, you need to be careful, and use the same procedure to find degrees Celsius when the number isn't marked that you use to find degrees Fahrenheit.
VO: What Celsius temperature is the same as 80 degrees Fahrenheit?
(Note: This number may have to change. It should be an unmarked Celsius temperature which lines up with a marked Fahrenheit temperature.)

FEEDBACK:
FOR CORRECT RESPONSE: Yes, that's the correct answer. Congratulations!
FOR INCORRECT UNPREDICTED RESPONSE:
No, you got it wrong. Good luck next time.
FOR INCORRECT PREDICTED RESPONSE: If 34 Degrees, No, that's incorrect. You're close, but it seems you are counting each little mark as 2 degrees. If 80 (?) degrees, No, the Celsius temperature won't be the same as the Fahrenheit temperature.
If you look at this drawing, you see that on the Celsius Scale, water freezes at 0 degrees and boils at 100 degrees. But on the Fahrenheit scale water freezes at 32 degrees and boils at 212 degrees. That means that zero Celsius is the same as 32 Fahrenheit. It also means that 100 Celsius is the same as 212 Fahrenheit. The Celsius numbers are pretty easy to remember, but a lot of people have trouble remembering the freezing and boiling temperatures for Fahrenheit. Practice usually helps people remember things like this better, so sometimes I cover up one number like this and ask what the temperature would be on the other scale.

What Fahrenheit temperature is the same as 0 degrees Celsius?
April 12, 1989 - ER

AUDIO

HOST: What Fahrenheit temperature is the same as 100 degrees Celsius?

SCREEN

GRAPHIC OF ELONGATED TEMPERATURE SCALE - same as above

PROPS, ETC.

PROPS: None

FEEDBACK:
FOR CORRECT RESPONSE: Yes, that's the correct answer. Congratulations!
FOR INCORRECT UNPREDICTED RESPONSE: No, that's incorrect. Keep trying.
FOR INCORRECT PREDICTED RESPONSE: If 100 degrees, No, that's incorrect. You want the boiling point on the Fahrenheit scale.

SCRIPT FOR QUIZ VOICE:

1) NARRATOR: What is the temperature shown by this thermometer?
   STILL OF OUTDOOR MERCURY THERMOMETER on left side of screen, registering 40 degrees. NUMBER BAR INPUT.
   Outdoor yellow mercury thermometer.

2) NARRATOR: What is the temperature shown by this thermometer?
   STILL OF OUTDOOR POINTER THERMOMETER on left side of screen, registering 60 degrees. NUMBER BAR INPUT.
   Outdoor pointer thermometer.

3) NARRATOR: What is the temperature shown by this thermometer?
   STILL OF OUTDOOR MERCURY THERMOMETER on left side of screen, registering 64 degrees. NUMBER BAR INPUT.
   Outdoor mercury thermometer.

4) NARRATOR: What is the temperature shown by this thermometer?
   STILL OF OUTDOOR POINTER THERMOMETER on left side of screen, registering 52 degrees. NUMBER BAR INPUT.
   Outdoor pointer thermometer.
5) NARRATOR: What is the temperature shown by this thermometer?

6) NARRATOR: What is the temperature in degrees Celsius shown by this thermometer? (NOTE: This is the only question where both Celsius and Fahrenheit scales will show. Also, marked Fahrenheit temperature must match unmarked Celsius)

7) NARRATOR: What Fahrenheit temperature is the same as 0 degrees Celsius?

8) NARRATOR: At what temperature does water boil?
Audio

#1 - HOST: Time is very important for many jobs - especially in the restaurant business. It's more than getting to work on time. The workers here need to tell time in order to prepare the food - and to make sure everything is ready to serve our customers. A clock or watch is a kind of measuring instrument - used to measure time. Just like a ruler is used to measure length or a thermometer for temperature.

#2: I know a lot of people have the new digital watches, but I've found that...

#3: You can't beat a good old numbered watch for understanding the basics of time.

#4 - HOST VO: There are two basic units used to measure time - hours and minutes.

#5: In order to tell what time it is, you must look at the position of the hands.

#6: The shorter hand shows the hour - it's called the hour hand....

#7: ...and the longer hand shows the minutes - it's called the minute hand.

#8: The numbers on these time pieces go from 1 to 12 - and you tell the hour by looking at the number that the shorter hand is pointing to.

#9: On my watch it's pointing to the 10. When one whole hour goes by, then the shorter hand will be pointing to the 11.

Screen

#1 - MOTION: Host sitting at desk working on something; looks up and addresses camera

#2: Host starts removing analog watch from wrist

#3: Host holds watch to camera to show numbers; CU watch face in upper half of screen and square to camera

#4 - GRAPHIC: Watch face; Arabic numbers; two hands; marks along outer perimeter

#5: Arrow points to hands

#6: Arrow points to hour hand

#7: Arrow points to minute hand

#8: Sweeping arrow clockwise around watch face from 1

#9: Arrow points to hour hand at 10, then sweeping arrow one rotation around numbers and points to 11

Props, etc.

#1-3: Existing desk/table; Arabic number wall clock [cdh]; in/out boxes; papers/order forms, etc.; pencils/pens in holder; Arabic number watch [er?]

#4-34 [Computer program graphics/text]
#10 - HOST VO: You should remember that when about half an hour or more has passed, the shorter hand will be between two numbers. So, on my watch, around 10:30 - and later, the hour hand will be between the 10 and 11. When you say the time, though, you always use the number that the hour hand has just passed - here it would be 10. You can't say 11 until the hour hand is really pointing to the 11.

#11: When the hour hand has pointed to each number, then 12 hours have passed. That's half of the 24 hours in a day.

#12: And, you know that we think of the first 12 hours as morning - or A.M., and the second 12 hours as afternoon or night - or P.M.

A whole hour is made up of 60 minutes. ...

#13: Look closely at the watch and you can see tiny marks between each of the numbers. Altogether, there are 60 marks - one for each minute in an hour.

#14: You tell the minutes by looking at the mark that the longer hand is pointing to. On my watch it's pointing to the third mark - or 3 minutes. When another minute goes by, then the minute hand will be pointing to the fourth mark - or four minutes.

#15: When the minute hand has pointed to each mark, then 60 minutes have passed - or one whole hour.

#10 - GRAPHIC: same watch face; solid shade right half; mottled shade up to 55 minutes; highlight lines perpendicular to 10 and 11; arrow points to hour hand

#11: sweeping arrow clockwise rotation from 12 to 12

#12: sweeping yellow arrow clockwise labeled A.M.; '12 hours' plots as first addend; repeat with blue arrow labeled P.M.; '12 hours' plots as second addend, then plus sign, line, and '24 hours = 1 day'

#13: highlight marks along edge and then sweeping arrow makes rotation clockwise from 1

#14: arrow points to minute hand; highlight third mark, then highlight fourth mark

#15: sweeping arrow makes rotation clockwise; '60 minutes = 1 hour
4/19/89 cdh

AUDIO

#16 - HOST VO: You could count each mark to find out the minutes, but that can be hard when you get to higher numbers. It's easier to start your count by fives.

#17: Here's how it works. From one number to the next number there are 5 marks - or 5 minutes. So, you can use the numbers from 1 to 12 to count by fives. When the minute hand is pointing to the 1, it's 5 minutes; at the 2, it's 10 minutes; at the 3, it's 15 minutes;...

#18: ...20 minutes;...

#19: ...25 minutes;...

#20: ...30 minutes; and on by fives until you get to the 11, which is 55 minutes.

#21: When the minute hands points to the 12, a whole hour has passed.

#22: But, you don't say 60 minutes. Instead, you just say the next hour and o'clock. So, when someone says it's 2 o'clock or 9 o'clock, you know the minute hand is pointing to the 12.

#23: On the watch, the minute hand is pointing to the 2, so that's 10 minutes. The hour hand is pointing to the 10, so the hour is 10.

#24: That means the time is 10 minutes after 10. Now it's your turn to try some examples.

SCREEN

#16 - GRAPHIC: rotating highlight of minute marks

#17: highlight 5 marks between 1 and 2;

arrow points to 1;
arrow points to 2;
arrow points to 3

#18: arrow points to 4

#19: arrow points to 5

#20: arrow points to 6
arrow points to 11

#21: arrow points to 12

#22: same watch face graphic

hands appear at 9:00; disappear, then hands at 2:00 appear

#23: hands at 10:10;
arrow points to 2;
arrows points to 10;

#24: text of time 10:10 appears

PROPS, ETC.
4/19/89  cdh

AUDIO

#25 - HOST VO: What time does the watch show now?

#25A - NARRATOR VO: Touch the blue dot next to the correct answer.

#25B - HOST VO: [CAF 7:00] Yes, that's the correct answer. Congratulations!

[AWF - 12:35] No, that's the wrong answer. You mixed up the minute and hour hands.

[AWF - 7:12] No, that's the wrong answer. You're using the 1 through 12 numbers for both hours and minutes. Count minutes by fives.

[AWF - 12:07] No, that's the wrong answer. You mixed up the minute and hour hands, and you're using the 1 through 12 numbers for both hours and minutes. Count minutes by fives.

#26 - HOST VO: What time does the watch show now?

#26A - NARRATOR VO: Touch the numbers on the bar to answer. Then touch enter.

#26B - HOST VO: [CAF 3:15] Yes, that's the right answer. You're doing a good job.


[AWF - 3:00] No, your answer is incorrect. Both hands are on the same number.

SCREEN

#25 - GRAPHIC: watch face upper third of screen; set at 7 o'clock; multiple choice:
- 7:00
- 7:12
- 12:35
- 12:07

#25A - matching directions text overlay

#25B - matching feedback text overlay

#26 - watch set at 3:15; number bar entry

#26A - matching directions text overlay

#26B - matching feedback text overlay

PROPS, ETC.
#27: What time does the watch show now?

#27A: [CAF 12:30] Yes, your answer is correct. Keep up the good work.

[AWF - 12:06] No, that's incorrect. You're using the 1 through 12 numbers for both hours and minutes. Count minutes by fives.

[AWF - 1:30] No, that's incorrect. The hour hand is between two numbers, so use the number that the hand has just passed.

[AWF - 6:03] No, that's incorrect. You mixed up the minute and hour hands, and you're using the 1 through 12 numbers for both hours and minutes. Count minutes by fives.

#28: What time does the watch show now?

#28A: [CAF 8:40] Yes, that's the right answer. Good job!

[UWF] No, that's the wrong answer. Try again.

[AWF - 9:40] No, you got it wrong. The hour hand is between two numbers, so use the number that the hand has just passed.

[AWF - 8 or 9:00] No, you got it wrong. The minute hand isn't pointing to 12.
No, you got it wrong. You're using the 1 through 12 numbers for both hours and minutes. Count minutes by fives.

No, you got it wrong. You mixed up the minute and hour hands, and you're using the 1 through 12 numbers for both hours and minutes. Count minutes by fives.

Of course the minute hand isn't always pointing to one of the numbers on the watch. But all you have to do to tell the exact minutes is count by fives until you get to the number just before the minute hand.

Then count by ones to the mark where the minute hand is.

On my watch it's ... 5, 10, 15, 20 ..., 21, 22 minutes after the hour.

Try a couple of examples on your own. Remember to use all the information you've learned so far.

What time does the watch show now?

Yes, that's the correct answer. Congratulations!

No, that's the wrong answer. You mixed up the minute and hour hands.
No, that's the wrong answer. You're using the 1 through 12 numbers for both hours and minutes. Count minutes by fives.

[AWF - 1:11] No, that's the wrong answer. You mixed up the minute and hour hands, and you're using the 1 through 12 numbers for both hours and minutes. Count minutes by fives.

#34: What time does the watch show now?

#34A: [CAF 4:44] Yes, that's the right answer. You're doing a good job!

[UWF] No, you got it wrong. Good luck next time.

[AWF - 5:44] No, your answer is incorrect. The hour hand is between two numbers, so use the number that the hand has just passed.

[AWF - 9 or 20 or 25] No, your answer is incorrect. You mixed up the minute and hour hands.

[AWF - 9:04-40-05-50] No, your answer is incorrect. You mixed up the minute and hour hands, and you're using the 1 through 12 numbers for both hours and minutes. Count minutes by fives.

[AWF - 4:09-90 or 5:09-90] No, your answer is incorrect. You're using the 1 through 12 numbers for both hours and minutes. Count minutes by fives.
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**AUDIO**

#35 - HOST: So, you can see, there are lots of things to remember in telling time - but if you use the information you've learned, you won't have any problems.

#36: There are two more - little - things I should let you in on, though.

#37: Sometimes we use the clock radio to time things in the restaurant. All you have to do is touch the digital display until it shows the correct time.

#38: My watch shows 10:35...

#39 - HOST VO: So, that's the time I want the radio to show. (pause) There! 10:35 is correct. You'll see how easy it is. Just touch the enter box to try the examples.

#40 - NARRATOR VO: Touch the boxes on the clock radio to set the time. Each touch will change the number in a box. When you're done, touch enter.

#40A- HOST VO (cont) [CAF 12:42] Yes, that's the right answer. Good job!


[AWF - 1:42] No, that's the wrong answer. The hour hand is between two numbers, so use the number that the hand has just passed.

**SCREEN**

#35 - MOTION: host sitting on edge of desk, putting watch back on wrist; addressing camera

#36: walks nearby to location of clock radio

#37: tips up radio to face camera squarely; points to display; sets radio down

#38: move to CU watch face in upper left third of screen and square to camera

#39 - GRAPHIC: watch showing 10:35 in upper left 1/3 corner and radio face square to camera in upper right 2/3 of screen; 'Set the clock radio to the correct time.' and directions on screen; automatic touches of each box until 10:35 shows

#40: new time on watch - 12:42; same radio; directions remain

#40A - GRAPHIC: matching feedback text overlay [computer program graphics/ text]

**PROPS, ETC.**

#35-38: clock radio [er] in any different location in kitchen; same Arabic number watch - on host's wrist

#39-47 [computer program graphics/ text]
#40A cont.  [AWF- 8 or 9:03] No, that's the wrong answer. You mixed up the minute and hour hands.

[AWF - 8 :12 or 01-10] No, that's the wrong answer. You mixed up the minute and hour hands, and you're using the 1 through 12 numbers for both hours and minutes. Count minutes by fives.

[AWF - 12:08-80 or 1:08-80] No, that's the wrong answer. You're using the 1 through 12 numbers for both hours and minutes. Count minutes by fives.

#41: Set the clock radio to the correct time.

#41A [CAF 9:10] Yes, your answer is correct. Keep up the good work.

[UWF] No, that's the wrong answer. Try again.

[AWF- 2:45] No, your answer is incorrect. You mixed up the minute and hour hands.

[AWF - 2:09 or 90] No, your answer is incorrect. You mixed up the minute and hour hands, and you're using the 1 through 12 numbers for both hours and minutes. Count minutes by fives.

[AWF - 9:02 or 20] No, your answer is incorrect. You're using the 1 through 12 numbers for both hours and minutes. Count minutes by fives.

#41-GRAPHIC : new time on watch - 9:10; same radio; directions remain

#41A - GRAPHIC : matching feedback text overlay [computer program]
The other thing you should know is the abbreviated way to write hour - or hours ...

...and minutes.

H-R-period, is the abbreviation for hour - the first and last letters - H-R,...

...and M-I-N-period, is the abbreviation for minutes - the first 3 letters - M-I-N.

This is pretty easy, so one example for each should be enough.

Which answer shows the correct abbreviation for hour?

[CAF 10 hr.] Yes, that's the right answer. You're doing a good job.

No, that's incorrect. Remember, it's the first and last letters.

Which answer shows the correct abbreviation for minutes?

[CAF 24 min.] Yes, that's the correct answer. Congratulations!

No, you got it wrong. Remember, it's the first three letters.

Abbreviations' appears as title; 'hour' appears on screen

'minutes' appears on screen below 'hour'

'hr.' appears to right of 'hour'

'min.' appears to right of 'minutes'

multiple choice question and directions on screen:

matching feedback text overlay

multiple choice; directions on screen:

matching feedback text overlay
Something that almost every new worker here has to learn to do is keep track of how much time it takes to finish different jobs. It's really just a different way of thinking about the work you do. But, most of all, it's a habit. That means it's something you have to practice over and over until it's an automatic thing. I've been pretty successful in helping my employees learn how to estimate their time, and I'll give you the same tips.

First, you have to get in the habit of checking the clock - or your watch - every time you begin a job.

Second, you have to check the time at some natural breaking point - like halfway - or at the end of the job.

Let me show you a simple example.

Let's say I'm just starting on breakfast prep - sorry, that's short for preparation. The job sheet tells me that one task is 4 grapefruits - peeled and carefully divided into sections.

When I start, I look at my watch for the starting time.

#2: gestures to watch (or clock)

#3 - GRAPHIC: 4 grapefruits in row; paring knife just forward

Watch showing 5:00; 3 grapefruit still in row; 1 moved forward by knife as if in a work space
Then, I peel and separate one of the grapefruits.

I look at my watch for the stopping time. It took me 5 minutes.

Now, how can I use this to figure out how long it will take me to finish the task.

The whole task uses 4 grapefruits and I know it took me 5 minutes to do one. So, I can estimate that each other grapefruit will also take me about 5 minutes.

I can add the 4 times 5 minutes, plus 5 minutes, plus 5 minutes. Or, I can multiply 5 minutes times 4 grapefruits.

Either way, my estimate is 20 minutes for the whole task.

The basic procedure is the same, and you can use it for all kinds of tasks. Just remember to determine your starting time and finishing time for some part of the whole task, and then add or multiply to find the total time.

Try some examples, now. But, remember, this is a habit, so try to practice on your own, too.
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AUDIO

#9 HOST VO: Peeling half the potatoes has taken 10 minutes. How many minutes will it take to peel all the potatoes?

#9A: [CAF 20 min] Yes, that's the correct answer. Congratulations!


[AWF - 50 or 100 min] No, your answer is incorrect. Don't count each potato. HALF the potatoes took 10 minutes.

[AWF - 10 min] No, your answer is incorrect. That's the time for peeling just HALF the potatoes.

#10: Preparing the crust for one apple pie has taken 12 minutes. How many minutes will it take to prepare crust for 5 pies?

#10A: [CAF 60 min] Yes, you got it right. Good job!

[UWF] No, that's the wrong answer. Try again.

[AWF - 25 min] No, that's the wrong answer. You're forgetting about the 12 minutes for each crust.

SCREEN

#9 - GRAPHIC: 10 potatoes; 5 peeled

#9A: matching feedback text overlay

#10 - 1 pie plate with crust; 4 empty pie plates; flour, rolling pin, etc.

#10A: matching feedback text overlay
#1 - HOST: After the workers get used to keeping track of how much time it takes to finish one task, they must learn how to figure out amounts of time needed to complete several jobs.

Sometimes, when the amount of time is more than 60 minutes in one hour, they have to change the minutes to hours and minutes.

They also have to be able to figure out when to start a job - based on the amount of time it takes - and, when a job will be finished.

#2: I know this sounds pretty hard, but we've come up with some rules that help in remembering what to do.

#3 - HOST VO: Rule one: Determine the amount of time you need for each task that has to be done and add the times together.

#4: For example, Eddie has to clear dirty dishes from a table, wash the table, and set it up again for the next customer.

When we're busy, it's important to prepare the tables as quickly as possible. I know about how long it should take to do this job, and I wanted Eddie to learn to work fast enough. I asked him to keep track of the time for each task, so we'd know if he was making progress.
#5 - HOST VO: Eddie reported these times. 4 minutes to clear a table for 4, 1 minute to wash it, and 3 minutes to set it up again.

You just add the numbers to figure out how long it took Jenny to do the job. There - 8 minutes altogether.

#6: Now let's take it one more step. Eddie has to keep the work station stocked, too. It took 15 minutes to fill the silverware trays, 25 minutes to get the salt and pepper shakers and the catsup and steak sauce bottles filled, and, 35 minutes to fold the napkins.

Remember, you add all the times - and it's 75 minutes altogether.

#7: Well, 75 is more than the 60 minutes in an hour. So, here's RULE TWO.

When the total time is more than 60 minutes, DIVIDE the minutes by 60. The whole number answer is the number of hours, and the remainder is the number of minutes.

#8: So, you have to divide by 60.

60 will go into 75, 1 time. And, that's 60.

Then, you just subtract to find out how many minutes are left - 15.

So, it took Eddie 1 hour and 15 minutes to prepare the work station.
If you have trouble with division, you can always use my repeated subtraction substitute. It works like this.

First, you need to remember that there are 60 minutes in 1 hour. Then, to change from minutes, to hours and minutes, you subtract 60 minutes - or 1 hour - at a time, until there aren't enough minutes left for another whole hour. The number remaining will be less than 60 minutes and it is the number of minutes left over. If you get a zero, that means there aren't any extra minutes.

Here's what we'd do to figure out Eddie's time. Start with 75 minutes. We ask - Do we have 60 minutes or more? Yes, we do, so we subtract 60 minutes.

We ask again - Do we have 60 minutes or more? No, we don't. So, this number is our remaining number of minutes.

Now, we count the number of times we subtracted 60 minutes - one time. That's 1 hour. And, we have 15 minutes remaining. 75 minutes is the same as 1 hour and 15 minutes.

Now try an example for yourself.
AUDIO

#10 - HOST VO: Lisa does breakfast prep and takes 30 minutes to set out all the ingredients, 50 minutes to prepare the biscuits and rolls, 20 minutes to prepare the grapefruit sections, and 30 minutes to make all the orange juice and coffees.

How many minutes does it take Lisa to do breakfast prep?

#10A: [CAF 130 min] Yes, you got it right. Good job!

[UWF] No, you got it wrong. Good luck next time.

#11: How much is 130 minutes in hours and minutes?

#11A: [CAF - 2 hr 10 min] Yes, you got it right. Good job!


[AWF - 1 hr 70 min] No, your answer is incorrect. 60 goes into 130 2 times.

[AWF - 2 hr 00 min] No, your answer is incorrect. You forgot that the remainder is the minutes left over.

#12: If Lisa starts her job at 4:00, will she be finished in time for the breakfast crowd at 6:30?

#12A: [CAF - yes] Yes, that's the correct answer. Congratulations!

SCREEN

#10 - GRAPHIC: numbers in column

30
20
50
30

question on screen

#10A: matching feedback text overlay

#11: number bar entry; question and directions on screen

#11A: matching feedback text overlay

#12: multiple choice; Remember, it took Lisa 2 hr. and 10 min. to complete her job.

* yes
* no

#12A: matching feedback text overlay
No, that's the wrong answer. 4:00 to 6:30 is 2 hours and 30 minutes. It took Lisa 2 hours and 10 minutes to do her job. So, the answer is "yes," she will be finished in time for the breakfast crowd.

One way to figure out how many hours and minutes there are from a starting time to a stopping time, is to begin with the start time and count 1 hour for each time the minute hand can make one complete circle until you reach the hour of the stopping time.

For example, if you started a job at 11:30 and finished at 1:00, the minute hand would make one circle to 12:30,... but it couldn't make another complete circle to 1:30 because that's beyond your stopping time. So, the job took 1 hour...

and the minutes left until the stopping time - 30 minutes. Altogether, the job took 1 hour and 30 minutes.

Now, try some examples about starting and stopping times and how long jobs take to finish.

If you started a job at 9:30 and finished at 11:15, how many hours and minutes did it take to do the task?
#14A - HOST VO cont: [CAF - 1 hr 45 min] Yes, that's the right answer. You're doing a good job.

[UWF] No, your answer is incorrect. Keep trying.

[AWF - 2 hr] No, that's the wrong answer. If you started at 9:30, you'd have to work until 11:30 to work for 2 hours. You only worked until 11:15.

#15: If you started a job at 10:50 and finished at 1:30, how many hours and minutes did it take to do the task?

#15A: [CAF - 2 hr 40 min] Yes, you got it right. Good job!

[AWF - all] No, that's incorrect. Count forward from 10:50 to 1:30 to figure out how many whole hours there are; then add on the minutes.

#16: If you start a job at 7:45 and it takes 2 hours and 10 minutes to do, at what time will you be finished?

#16A: [CAF - 9:55] Yes, your answer is correct. Keep up the good work.

[AWF - all] No, you got it wrong. Start at 7:45 and count forward 2 hours; then add on the minutes.
#17: If you need to finish a job at 4:40 and it takes 2 hours and 10 minutes to do, at what time should you start?

#17A: [CAF - 12:30] Yes, that's the right answer. You're doing a good job.

[AWF - all] No, that's the wrong answer. Start at 4:40 and count backwards 2 hours; then add on the minutes.

#18: If you need to finish a job at 5:00, and one task takes 1 hour to do and another task takes 4 hours, at what time should you start?

#18A: [CAF - 12:00] Yes, that's the correct answer. Congratulations!

[AWF - all] No, that's the wrong answer. Start at 5:00 and count backwards 1 hour; then count back 4 more hours.
QUIZ

Q1 - HOST VO: What time does the watch show now?

Q2: Baking one batch of cookies has taken 8 minutes. How many minutes will it take to bake 6 batches of cookies?

Q3: Ben has to complete 4 tasks in order to close the restaurant at night: one task takes 45 minutes, another takes 20 minutes, another takes 30 minutes, and the last one takes 55 minutes.

Q4: How many minutes does it take Ben to do his job?

Q5: How much is 150 minutes in hours and minutes?

Q6: If Ben starts his job at 11:00, will he be able to go home at 1:30?

Q7: If you need to finish a job at 11:05, and it takes 4 hours and 50 minutes, at what time will you be finished?

Q8: If you need to finish a job at 6:00, and one task takes 3 hours to do and another task takes 1 hour, at what time should you start?
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#1 - HOST: Money is pretty important in our lives, so it's smart to know a lot about it. Our money system is based on dollars and cents. We usually write money numbers with a dollar sign and a decimal point.

#2 - HOST VO: We start with the dollar sign followed by the number for whole dollars, then the decimal point, and then the number for the cents.

#3: Look at this number and touch the number of dollars.

#3A: [CAF 155] Yes, that's the correct answer. Congratulations!

[AWF- 23] No. you got it wrong. That's the cents.

Now touch the number of cents.

#3B: [CAF 23] Yes, that's the right answer. Good job!

[AWF- 155] No, your answer is incorrect. That's the dollars

#4: When we say an amount of money - or write it in words, we always read the dollar amount first followed by the word "dollars." If there are both dollars and cents, we read the decimal point as "and" followed by the word "cents."

#1 - MOTION: host sitting at desk counting money; looks up and addresses camera

#2-GRAPHIC: text at top and $20.75 in center; arrow points to each item as mentioned

#3: text at top and $155.23 in center

#4: text at top and $20.75 in center; then, twenty dollars and seventy-five cents

PROPS, ETC.

#1: existing desk/table; wall clock [cdh]; in/out boxes; papers/order forms, etc.; pencils/pens in holder; reasonable number of bills and coins; maybe cash drawer
AUDIO

#5 - HOST VO: Which answer means the same thing as 155 dollars and 23 cents?

#5A - NARRATOR VO: Touch the blue dot next to the correct answer.

#5B - HOST VO: [CAF words $155.23] Yes, your answer is correct. Keep up the good work.

[AWF- words $23.55] No, that's the wrong answer. You're reading the cents as dollars.

[AWF - words $155] No, that's the wrong answer. You forgot the cents.

[AWF - words $15.52] No, that's the wrong answer. Always look carefully at the decimal point.

#6: If there aren't any cents, we just read the dollar amount and the word "dollars."

#7: Which answer means the same thing as 97 dollars?

#7A: [CAF words $97] Yes, your answer is correct. Keep up the good work.

[AWF- words $9.70] No, you got it wrong. There aren't any cents.

[AWF - words $9700 or $.97] No, you got it wrong. Always look carefully at the decimal point.

SCREEN

#5 - GRAPHIC: question and directions on screen; multiple choice:
- one hundred fifty five dollars and twenty-three cents
- twenty three dollars and fifty-five cents
- one hundred fifty five dollars
- fifteen dollars and fifty-two cents

#6: text at top and $ 25.00 in center; then, twenty-five dollars

#7: question and directions on screen; multiple choice:
- $ 97.00
- $ 9.70
- $ 9700.00
- $ .97
#9 - HOST VO: If the amount is only cents, we can write it two ways. The first uses the dollar sign followed by the decimal point and then the cents. The second way uses a cent sign.

#9: Which answer means the same thing as 63 cents?

#9A: [CAF $ .63] Yes, that's the right answer. You're doing a good job.

[AWF - $63.00] No, your answer is incorrect. Cents come after the decimal point.

[AWF - $6.30] No, your answer is incorrect. There are no dollars - only cents.

[AWF - $ .36] No, your answer is incorrect. You reversed the numbers.

#10: Which answer means the same thing as the amount written below?

#10A: [CAF words $ .78] Yes, that's the right answer. Good job!

[AWF - words $78.00] No, that's the wrong answer. Cents come after the decimal point.

[AWF - words $7.80] No, that's the wrong answer. There are no dollars - only cents.

[AWF - words $ .87] No, that's the wrong answer. You reversed the numbers.
In our money system, the penny is the smallest coin and the dollar is the smallest bill. It takes 100 pennies to equal one dollar.

It would be hard to carry around only pennies, though. So, we have other coins. The most common ones are the nickel, the dime, and the quarter. Each of these coins is the same as a certain number of pennies. The nickel equals 5 pennies; the dime - 10 pennies; and the quarter - 25 pennies.

You try some examples now.

How many pennies equal 1 nickel?

Touch the numbers on the bar to answer. Then touch enter.

Yes, that's the correct answer. Congratulations!

No, that's incorrect. Keep trying.

How many pennies equal 1 dime?

Yes, that's the right answer. Good job!

No, your answer is incorrect. Keep trying.
#5 - HOST VO: How many pennies equal 1 quarter?

#5A: [CAF 25] Yes, that's the right answer. You're doing a good job!

[UWF] No, you got it wrong. Good luck next time.

#6: How many pennies equal 1 dollar?

#6A: [CAF 100] Yes, that's the right answer. Good job!

[UWF] No, your answer is incorrect. Keep trying.

#7: Even though we use names like nickel and quarter, when we write these coins as numbers, we write the number of pennies in each, like this. Or, sometimes like this.

#8: We use these coins so often that it's important to know certain common equivalencies:
   - 2 nickels equal 1 dime,
   - 20 nickels equal 1 dollar,
   - 10 dimes equal 1 dollar, and
   - 4 quarters equal 1 dollar.

Your turn for some examples.

#9: How many nickels equal 1 dime?

#9A - NARRATOR VO: Touch the coin as many times as you need. When you're done, touch enter.
#9B - HOST VO: [CAF 2] Yes, that's the correct answer. Congratulations!


#10: How many nickels equal 1 dollar?

#10A: [CAF 20] Yes, that's the right answer. Good job!

[UWF] No, your answer is incorrect. Keep trying.

#11: How many dimes equal 1 dollar?

#11A: [CAF 10] Yes, that's the right answer. You're doing a good job!

[UWF] No, you got it wrong. Good luck next time.

#12: How many quarters equal 1 dollar?

#12A: [CAF 4] Yes, that's the right answer. Good job!

[UWF] No, your answer is incorrect. Keep trying.

#13: We also have 4 common bills - the dollar, 5 dollar, 10 dollar, and 20 dollar bills. The name of each bill gives away its value, so it's easy to tell how many 1 dollar are in a larger bill.

#10 - GRAPHIC: nickel and dollar; question and directions on screen; touch the object

#11: dime and dollar; question and directions on screen; touch the object

#12: quarter and dollar; question and directions on screen; touch the object

#13: amount in ones = @
There are also common equivalencies for our bills that you need to know:
- 2 fives equal 1 ten,
- 4 fives equal 1 twenty, and
- 2 tens equal 1 twenty.

Okay, you try some examples.

#15: How many 1 dollar bills equal 10 dollars?

#15A: [CAF 10] Yes, that's the right answer. You're doing a good job!

[UWF] No, that's the wrong answer. Try again.

#16: How many 5 dollar bills equal 10 dollars?

#16A: [CAF 2] Yes, that's the correct answer. Congratulations!

[UWF] No, you got it wrong. Good luck next time.

#17: How many 5 dollar bills equal 20 dollars?

#17A: [CAF 4] Yes, your answer is correct. Keep up the good work.

[UWF] No, your answer is incorrect. Keep trying.
A: How many 10 dollar bills equal 20 dollars?

A: [CAF 2] Yes, that's the right answer. Good job!

#1 - HOST: Every day we have to count the cash we have on hand at the restaurant. The easiest way to do this is to put the coins and bills in separate piles by their values. Count each pile into whole dollars. And, then count the remaining money.

#2: Let me show you a simple example. I already have a pile of nickels, and I want to know how much I have in dollars and cents. I remember that 20 nickels equal 1 dollar. So, I want to count groups of 20 nickels.

#3: [This can be fairly rapid] 1-2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18-19-20. There's one group.

#4: But, the nickels left don't look like they'll make another group. To find their value, I just count by fives, since each nickel is worth 5 pennies. So, I have the one pile I counted -- that's 1 dollar -- and 5-10-15-20-25 cents.

#5: Okay, you count the pile of dimes.

#5A - NARRATOR VO: Touch a coin to put it in a group. When you have enough coins in the group to equal $1.00, touch the dollar sign box. Keep going until you have all the one-dollar groups you want. Then touch enter.

#5B - HOST VO: [CAF 3 groups -100] Yes, that's the correct answer. Congratulations!
#5B cont - HOST VO: [UWF] No, your answer is incorrect. Keep trying.

[AWF] No, your answer is incorrect. At least one of your piles has less than one dollar in it.

[AWF] No, your answer is incorrect. At least one of your piles has more than one dollar in it.

#6: How much money is there in dollars and cents?

#6A - NARRATOR VO: Touch the numbers on the bar to answer. Then touch enter.

#6B - HOST VO: [CA: $3.70] Yes, that's the right answer. Good job!


[AWF] No, that's incorrect. You miscounted the change left in the pile.

#7: Now count the pile of quarters.

#7A - NARRATOR VO: Touch a coin to put it in a group. When you have enough coins in the group to equal $1.00, touch the dollar sign box. Keep going until you have all the one-dollar groups you want. Then touch enter.

#7B-HOST VO: [CAF 1 group: 100] Yes, that's the right answer. You're doing a good job!
Hello! Your task today is to practice counting money. You will be given a set of coins and you need to count them accurately.

Let's get started with the first set of coins.

Audio:

97B - Host VO cont: [CAF 1 group - 100] Yes, that's the right answer. You're doing a good job!

[UWF] No, you got it wrong. Good luck next time.

[AWF] No, you got it wrong. At least one of your piles has less than one dollar in it.

[AWF] No, you got it wrong. At least one of your piles has more than one dollar in it.

98: How much money is there in dollars and cents?

98A - Narrator VO: Touch the numbers on the bar to answer. Then touch enter.

98B - Host VO: [CAF $1.75] Yes, you got it right. Good job!


[AWF] No, that's incorrect. You miscounted the change left in the pile.

99 - Host: Of course you know that we don't always receive just dimes or just quarters. We have all the types of coins to count. But, finding the total amount works in the same way. I've already counted out all the one-dollar groups I can make. Now, I want to count the coins that were left over.

99 - Motion: same desk/table; host doing something with money; distinct piles of 4 quarters, 10 dimes, and 20 nickels; left over coins -- 1 quarter, 2 dimes, 1 nickel, 5 pennies -- in same area but not as distinct group; several bills in background; gestures to each group and left overs
#9 HOST cont: Watch how I do it. Count the quarters first -- they're the largest value. There's just one, so I start counting at 25 cents.

#10: A dime equals 10 cents, and I have 2 dimes. I had 25 cents, and now it's 35 cents.

#11: There's one nickel or 5 cents. I was at 45, so now it's 50 cents.

#12: And, there are 3 pennies at one cent each for 51-52-53 -- 53 cents. Altogether, in coins, I have 3 dollars and 53 cents.

Try counting a pile of coins.

#13 - NARRATOR VO: Touch a coin to put it in a group. When you have enough coins in the group to equal $1.00, touch the dollar sign box. Keep going until you have all the one-dollar groups you want. Then touch enter.

#13B - HOST VO: [CAF 2 groups - 100] Yes, your answer is correct. Keep up the good work.

[UWF] No, that's the wrong answer. Try again.

[AWF] No, your answer is incorrect. At least one of your piles has less than one dollar in it.

[AWF] No, your answer is incorrect. At least one of your piles has more than one dollar in it.

SCREEN
#9A - MOTION cont: looks up and then touches quarter -- in front of him

#10: touches each dime and slides into group with quarter

#11: touches nickel and slides into group with previous coins

#12: touches each penny and slides into group with previous coins; gestures to each one-dollar group and then to left overs now in their own group

#13 - GRAPHIC: graphics and directions on screen; new grouping entry
AUDI

#14 - HOST VO: How much money is there in dollars and cents?

#14A: [CAF $2.73] Yes, you got it right. Good job!

[UWF] No, your answer is incorrect. Keep trying.

[AWF] No, that's incorrect. You miscounted the change left in the pile.

#15: When we have bills to count with the coins, we get the total by counting the bills first and then adding that amount to what we get when we count the coins.

#16: First, count the amount of money in bills. How much money is that?

#16B: [CAF $16.00] Yes, your answer is correct. Keep up the good work.

[UWF] No, you got it wrong. Good luck next time.

#17: Now, count the amount of money in coins.

#17A - NARRATOR VO: Touch a coin to put it in a group. When you have enough coins in the group to equal $1.00, touch the dollar sign box. Keep going until you have all the one-dollar groups you want. Then touch enter.

#17B - HOST VO: [CAF 2 groups - 100] Yes, that's the right answer. You're doing a good job!
#17A - HOST VO [UWF] No, that's the wrong answer. Try again.

[AWF] No, you got it wrong. At least one of your piles has less than one dollar in it.

[AWF] No, you got it wrong. At least one of your piles has more than one dollar in it.

#18: How much money is there altogether in dollars and cents?

#18A: [CAF $18.47] Yes, that's the correct answer. Congratulations!

[UWF] No, your answer is incorrect. Keep trying.

[AWF] No, that's incorrect. You miscounted the change left in the pile.

#18 - GRAPHIC: same screen as answer for #17, except number bar replaces previous directions
#1 - HOST: Making change is something that all the waiters and waitresses have to do. And, I want them to be right every time. We don't want to cheat our customers OR ourselves.

This is a small business, and we don't have one of those cash registers that automatically shows the amount of change to give.

#2: We keep paper and pencils by our cash register so we can just subtract the amount of the bill from the amount of money a customer gives us. Like this: if a customer gave me a 10-dollar bill to pay for a 4-dollar and 65 cent bill. I'd just subtract to figure out the change due - 5 dollars and 35 cents

You try some examples now.

#3: For a bill of $1.37, how much change should you give from a 5-dollar bill?

#3A - NARRATOR VO: Touch the numbers on the bar to answer. When you're done, touch enter.

#3B - HOST VO: [CAF $3.63] Yes, that's the correct answer. Congratulations!


#4: For a bill of $ .33, what should you do to figure out the change to give from a 1-dollar bill?

#4: graphic of 1-dollar bill and written bill for $.33; multiple choice
- subtract $.33 from $1.00
- subtract $1.00 from $.33
- add $1.00 and $.33
- multiply $.33 times $1.00
#4A - NARRATOR VO: Touch the blue dot next to the correct answer.

#4B HOST VO: [CAF subtract $ .33 from $1.00] Yes, that's the right answer. Good job!

[AWF - add or multiply] No, your answer is incorrect. You will give back less money.

[AWF - subtract $1.00 from .33] No, your answer is incorrect. You want to subtract the amount of the bill from the dollar.

#5: Work this problem to find out how much change you should give.

#5A: [CAF $ .67] Yes, that's the right answer. You're doing a good job!

[LWF] No, you got it wrong. Good luck next time.

#6: When you give change, you should try to give the customer the fewest possible pieces of money. This means that you want to use the largest coins and bills you can when making change.

#7: Which picture shows the best coins to use when giving $.81 in change?

#7A: [CAF 3 quarters, 1 nickel, 1 penny] Yes, that's the right answer. Good job!

[AWF - all] No, your answer is incorrect. Remember, you want to use the fewest possible coins.
#7 HOST VO: Here's one strategy you can use to try to give the customer the fewest possible coins in change.

Always start with the largest coin that isn't more valuable than the amount of change due. That's easy to understand because the more valuable a coin is, the fewer of them you need to get to the total. Usually, this will be the quarter – 25 cents.

#8: Remember the quarter equivalencies you learned:
• 2 quarters equal 50 cents,
• 3 quarters equal 75 cents, and
• 4 quarters equal 1 dollar.

Let me show you the procedure:
After you take each coin, ask yourself if taking another of the same coin will put you over the amount of change due.

Try this example.

#9: Should you add another quarter to make the 67 cents in change? Remember, ask yourself if adding another quarter will put you over the amount of change due. If it won't, then go ahead and add it. If it will, move on to the next most valuable coin -- the dime.

#9A: [CAF yes] Yes, that's the right answer. Good job!

[AWF no] No, your answer is incorrect. Adding one more quarter will equal 50 cents -- less than the 67 cents in change needed.
#10 - HOST VO: Should you add another dime to make the 67 cents in change? Remember, ask yourself if adding another dime will put you over the amount of change due. If it won't, then go ahead and add it. If it will, move on the next most valuable coin -- the nickel.

#10A: [CAF no] Yes, your answer is correct. Keep up the good work.

[AWF yes] No, you got it wrong. Adding one more dime will equal 70 cents -- more than the 67 cents in change needed.

#11: Should you add another nickel to make the 67 cents in change?

#11A: [CAF no] Yes, you got it right. Good job!

[AWF yes] No, that's the wrong answer. Adding one more nickel will equal 70 cents -- more than the 67 cents in change needed.

#12: Should you add another penny to make the 67 cents in change?

#12A: [CAF yes] Yes, that's the correct answer. Congratulations!

[AWF no] No, that's incorrect. Adding one more penny will equal 67 cents -- the exact amount of change needed.

#13: Use the fewest possible coins to make 48 cents in change.
AUDI0

#13A - NARRATOR VO: Touch a piece of money as many times as you need. When you're done, touch enter.

#13B - HOST VO: [CAF 1 quarter, 2 dimes, 3 pennies] Yes, that's the correct answer. Congratulations!

[UWF] No, your answer is incorrect. Keep trying.

[AWF 1 quarter, 1 dime, 2 nickels, 3 pennies or 4 dimes, 1 nickel, 3 pennies or 9 nickels, 3 pennies] No, your answer is incorrect. You want to use the fewest possible coins.

#14: When the change due is more than a dollar, then the change will include bills. The procedure is almost the same -- except you'll be using bills, too.

Always start with the largest bill that is more valuable than the amount of change due. Then you just work down through the different bills until you have the same amount as the dollars in the change you need.

Try this example:

#15: Should you use a 20-dollar bill when the change due is $17.42? Remember, ask yourself if using a 20-dollar bill will put you over the amount of dollars due. If it won't, then go ahead and use it. If it will, move on the next most valuable bill -- the 10-dollar bill.

#15A: [CAF no] Yes, that's the right answer. You're doing a good job!

SCREEN

#14 - GRAPHIC: 20, 10, 5, and 1 bills each with clear value and name label; title - "Use the fewest possible bills in giving change"

#15: graphic of all bills at top; "The change needed is $17.42. Should you use a 20-dollar bill to make the change?"; yes-no blue dot question
AUDIO

#15A HOST VO cont: [AWF yes] No, you got it wrong. 20 dollars is more than the 17 dollars in change needed.

#16: Should you use a 10-dollar bill when the change due is $17.42?

#16A: [CAF yes] Yes, your answer is correct. Keep up the good work.

[AWF no] No, your answer is incorrect. 10 dollars is the largest bill you can use that is less than the 17 dollars in change needed.

#17: Should you add another 5-dollar bill to make the $17.42 in change?

#17A: [CAF no] Yes, that's the right answer. You're doing a good job.

[AWF yes] No, that's the wrong answer. Adding 5 dollars will equal 20 dollars -- more than the 17 dollars in change needed.

#18: Should you add another 1-dollar bill to make the $17.42 in change?

#18A: [CAF yes] Yes, you got it right. Good job!

[AWF no] No, you got it wrong. Adding 1 dollar will equal 17 dollars -- the exact amount of dollars in change needed.

#19: You have all the bills you need to make $17.42 in change. Now finish the problem by figuring out the coins needed for the 42 cents in change.

SCREEN

#16 - GRAPHIC: graphic of all bills at top; "The change needed is $17.42. Should you use a 10-dollar bill to make the change?"; yes-no blue dot question

#17: graphic of all bills at top; "The change needed is $17.42. 1 $10 and 1 $5 have been counted out. Should you give another 5-dollar bill to make the change?" 1 $10 and 1 $5 graphic below question; yes-no blue dot question

#18: graphic of all bills at top; "The change needed is $17.42. 1 $10, 1 $5, and 1 $1 have been counted out. Should you give another 1-dollar bill to make the change?" 1 $10, 1 $5, and 1 $1 graphic below question; yes-no blue dot question

#19: graphic of all bills and coins at top; 1 $10, 1 $5, and 2 $1 graphics = $17.00 text; ? graphic = $ .42 text
#20: Should you use a quarter to make the 42 cents in change?

[AWF no] No, your answer is incorrect. A quarter is the largest coin you can use that is less than the 42 cents needed.

#21: Should you use a dime to make the 42 cents in change?

[AWF no] No, you got it wrong. Adding a dime will equal 35 cents -- less than the 42 cents in change needed.

#22: Should you use a nickel to make the 42 cents in change?

[AWF no] No, that's the wrong answer. Adding a nickel will equal 40 cents -- less than the 42 cents in change needed.
AUDIO

#23 - HOST VO: How many pennies are needed to make the 42 cents in change?

#23A: [CAF 2] Yes, that's the correct answer. Congratulations!

[AWF 0 or 1] No, you got it wrong. That's not enough pennies.

[AWF 3+] No, you got it wrong. That's too many pennies.

#24: Try two problems on your own.

Use the fewest possible pieces of money to make $7.83 in change.

#24A: [CAF 1 $5, 2 $1, 3 quarters, 1 nickel, 3 pennies] Yes, you got it right. Good job!

[AWF] No, that's the wrong answer. You want to use the fewest possible pieces of money.

#25: Use the fewest possible pieces of money to make $18.91 in change.

#25A: [CAF 1 $10, 1 $5, 3 $1, 3 quarters, 1 dime, 1 nickel, 1 penny] Yes, that's the correct answer. Congratulations!

[AWF] No, your answer is incorrect. You want to use the fewest possible pieces of money.

SCREEN

#23 GRAPHIC: graphic of all coins at top; 1 $10, 1 $5, and 2 $1 bills, and 1 quarter, 1 dime, and 1 nickel have been counted out and are plotted below question. question and directions on screen; touch the object

#24: graphic of all bills and coins at top; question and directions on screen; touch the object

#25: graphic of all bills and coins at top; question and directions on screen; touch the object
<table>
<thead>
<tr>
<th>AUDIO</th>
<th>SCREEN</th>
<th>PROPS, ETC.</th>
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</thead>
</table>
| #1 - NARRATOR VO: Which answer means the same thing as 125 dollars and 75 cents? | #1 - GRAPHIC: question and directions on screen; multiple choice:  
  - one hundred twenty five dollars and seventy-five cents  
  - seventy five dollars and twenty-five cents  
  - one hundred twenty five dollars  
  - twelve dollars and fifty-seven cents | mvQ1        |
| #2: How many pennies equal 1 dime?                                  | "2: penny and nickel; question and directions on screen; number bar                      | mvQ2        |
| #3: How many nickels equal 1 dollar?                                | #3: nickel and dollar; question and directions on screen; touch the object               | mvQ3        |
| #4: How many 5 dollar bills equal 20 dollars?                       | #4: five and twenty; question and directions on screen; touch the object                  | mvQ4        |
| #5: Count the pile of coins.                                       | #5: 3quarters, 7 nickels, 3 pennies($1.13) graphics and directions on screen; new grouping entry | mvQ5        |
| #6: How much money is there in dollars and cents?                  | #6: same screen as answer for #5, except number bar replaces previous directions          | mvQ6        |
| #7: Count the amount of money in bills. How much money is that?     | #7: 1 ten, 2 fives, and 3 ones and mixture of all types of coins graphics and directions on screen; number bar entry | mvQ7        |
| #8: Now, count the amount of money in coins.                        | #8: same screen as answer for #7, except new grouping entry replaces previous number bar | mvQ8        |
| #9: How much money is there altogether in dollars and cents?       | #9: same screen as answer for #8, except number bar replaces previous directions           | mvQ9        |
#10 - NARRATOR VO: Which picture shows the best coins to use when giving $0.43 in change?

#11: Should you add another penny to make the 88 cents in change?

#12: Should you use a 5-dollar bill when the change due is $14.19?

#13: Use the fewest possible pieces of money to make $8.88 in change.

#10 - GRAPHIC: small graphics of coins; multiple choice:
- 1 quarter, 1 dime, 1 nickel, 3 pennies
- 4 dimes, 3 pennies
- 3 dimes, 2 nickels, 3 pennies
- 1 quarter, 3 nickels, 3 pennies

#11: graphic of all coins at top; "The change needed is $.88. 3 quarters, 1 dime, and 1 penny have been counted out. Should you give another penny to make the change?" 3 quarters, 1 dime, and 1 penny graphic below question; yes-no blue dot question

#12: graphic of all bills at top; "The change needed is $14.19. Should you use a 5-dollar bill to make the change?"; yes-no blue dot question

#13: graphic of all bills and coins at top; question and directions on screen; touch the object
April 25, 1989

Audio

Host: Your earnings are the money you’re paid for the work you do.

Your wage is the amount you’re paid for one hour’s work.

Host VO: But often we talk about pay as a weekly or yearly amount. Eight hours a day times five days is forty hours per week. This is the standard work week for most full-time jobs.

From your hourly rate, you can easily figure your weekly rate. Just multiply your hourly rate by the number of hours you work in a week. This amount is your base pay.

[Text screen, on right of screen]

8 Hours per day x 5 Days per week
40 Hours per week

Base pay is:

dollars per hour
x hours per week
--------- dollars per week

Props

Money and checks, calendar.
Suppose you are paid $7.00 an hour, and you work 40 hours a week. Multiplying the two figures, you get $280 per week.

Now you try one. How much will you earn each week if you work 40 hours a week, and you make $6.00 per hour?

NARRATOR VO: Touch the Numbers on the Bar to answer. When you're done, touch ENTER.

Host VO (240.00): Yes, that's the right answer. You're doing a good job. Incorrect (anticipated for $24, $2400, $24000): No, that's the wrong answer. Always check your decimal places carefully. Incorrect Unanticipated.
Host VO: Once you know your weekly pay, you can figure your annual or yearly pay. Just multiply your weekly pay by the number of weeks in a year -- 52. In our example, that's $280 times 52. That's $14,560.

Host VO: Suppose you make $240.00 a week. How much would you earn in one year?

Text screen. Number bar question:

280   Dollars per week
× 52   Weeks per year
----------
$14,560  Dollars per year

Text screen. Number bar question:

$240 Weekly rate
× 52 Weeks per year
------
Annual pay

Host VO: Feedback
(12,480): Yes, that's the correct answer. Congratulations!
Incorrect (anticipated, for $124.80, $1248.00, $124,800.00): No, your answer is incorrect. Always check your decimal places carefully.
Incorrect Unanticipated
Of course, there are other things besides your hourly rate and number of work hours that affect your pay. Some of these will add money to your paycheck, and some will take money away. Let’s look at the things that add money to your paycheck first. These things include getting a raise or a bonus, and working overtime.

A raise is a permanent increase in your hourly wage. If you were making $5 an hour, and got a 45 cent raise, you’d be making $5.45 per hour for every hour you work.

A bonus is a one-time sum of money for some really outstanding work you’ve done. You might get a bonus for making an extra effort when your boss needs you to.
Host VO: The last way to make more money than your regular pay is by working overtime. There is a law in this country that workers who are paid by the hour must be paid at a higher rate if they work more than 40 hours in a week. Usually, this rate is "time-and-a-half", which means you are paid your hourly rate plus half your hourly rate for each hour you work overtime.

Let's do an example. Say you're making $7.00 an hour. To find your overtime rate, you add 7 dollars and half of 7 dollars, or $3.50 and get a new hourly rate. At 7 dollars an hour, your overtime rate would be $10.50 per hour! Overtime can really affect your pay. Not only are you working more hours, you're being paid more too!

Now you do one.
What is the overtime rate, at time-and-a-half, for a worker making $6.00 per hour?

Feedback ($9.00/hr.):  
Yes, that's the correct answer. Congratulations!  
Incorrect (anticipated, for $6.50): No. Your answer is incorrect. You should have added the base pay of $6.00 per hour plus half the base pay to find your overtime rate.  

If the overtime rate was double-time, your overtime rate would be your rate per hour plus your rate per hour again. So if you were making $7.00 per hour, you'd add $7.00 per hour to that base rate for a total of $14.00 per hour. You can see why some people ask for overtime.
What is the overtime rate, at double-time, for a worker making $6.00 per hour?

Feedback: Yes, you got it right. Good job!
Incorrect (unanticipated): No, you got it wrong. Good luck next time.

Bonuses work differently. Bonuses are often based on a percent of your earnings. To figure out how much a 10% bonus is, it is just like figuring 10% on anything else -- you just move the decimal point one place to the left.

For example, suppose your base pay for one day was $56.00, and your boss gave you a 10 percent bonus. You move the decimal one place to the left and you get the amount of $5.600. But since cents only go to two decimal places, you just drop the extra zero [pronounced 'oh'] at the end. So the amount is...
$5.60.

Suppose you worked very hard for a whole week, and your boss rewarded you with a 10% bonus on your weekly pay. If your base pay is $240.00, how much is the 10% bonus?

Feedback ($24.00): Yes, that’s the right answer. You’re doing a good job.
Incorrect ($2.40, $240.00, $2,400.00): No, that’s the wrong answer. Always check how far you move the decimal.
Incorrect (unanticipated): No, that’s incorrect. Keep trying.

Bonuses are usually given in round numbers, like 10 percent or 15 percent. Once you know how to figure 10 percent, it’s pretty easy to figure other commonly used percents.
Suppose your boss said you’ll get a five percent bonus on $280.00. A ten percent bonus would be $28.00, right? Since five is half of 10, five percent is half of 10 percent. So, the five percent bonus is half of $28.00, or $14.00.

What is a 5 percent bonus on $48.00?

Feedback ($2.40): Yes, your answer is correct. Keep up the good work.
Incorrect (anticipated): No, your answer is incorrect. Remember 5 percent is half of 10 percent.
Incorrect (unanticipated): No, your answer is incorrect. Keep trying.

Now that you know how to find 5 percent and 10 percent, it’s easy to find other percents, like 15 percent or 20 percent. To find 15 percent, just add the 10 percent, that’s $5.60 to the 5 percent, that’s $2.80.
And that's $8.40 total.

What's 20 percent of $56.00?

Feedback (11.20): Yes, that is the right answer. Keep up the good work.
Incorrect (anticipated): No, your answer is incorrect. Remember 20 percent is 10 percent plus 10 percent.
Incorrect (unanticipated): No, your answer is incorrect. Keep trying.

Host VO: To find out how much you make, you add together all the different things that go into your pay. This total is called gross pay.
Here's how you figure out your gross pay for the week. Suppose your rate is $7.00 an hour, and you worked 45 hours. So, for the first 40 hours, your rate was $7.00/hour -- making $280 for the week. The other 5 hours, at time-and-a-half, your rate was (7.00 plus 3.50). That's $10.50 an hour. Ten fifty times five is $52.50. And 280 + 52.50 is $332.50 gross.

Most workers are paid by check. There are two parts to most paychecks -- the check you deposit in the bank and the paystub that is a record of your pay. This is an example of what paystubs look like. There are spaces for the different kinds of pay workers receive.

Where is the base pay recorded on this paystub? ($280.00)
NARRATOR VO: Touch the paystub in the correct place. When you’re done, touch ENTER.

Host VO: Feedback: Yes, you got it right. Good job.
Incorrect (anticipated): No, that’s the wrong answer. Base pay is sometimes called regular pay.
Incorrect (unanticipated): No, that’s incorrect. Keep trying.

Where is overtime pay recorded on this paystub?

Feedback: Yes, that’s the right answer. You’re doing a good job.
Incorrect (anticipated): No, that’s incorrect. All information about money earned in the pay period is usually recorded in the same area.
Incorrect (unanticipated): No,
that’s the wrong answer. Try again.

Where is the gross pay recorded on this paystub?

Feedback: Yes, you got it right. Good job!
Incorrect (anticipated): No, you got it wrong.
All information about money earned in the pay period is usually recorded in the same area.
Incorrect (unanticipated): No, you got it wrong. Good luck next time.

Host VO: Now, let’s look at all the things that come out of your paycheck -- deductions. It’s important for you to understand them because they affect how much of your pay you actually receive.
There are two different kinds of deductions -- required and voluntary. Required deductions are deductions employers have to make, by law. There are three required deductions, Federal taxes, State taxes and Social Security taxes.

Taxes are based on how much you make, and how much the government needs. Federal taxes are the biggest. Among other things, they are used for running the federal government, paying for the armed forces, providing help to foreign governments, and paying for scientific research and inter-state highways.

Where is the Federal income tax recorded on this paystub?

Feedback: Yes, that's the correct answer. Congratulations!
Incorrect (anticipated): All information about taxes for the pay period is usually recorded in
the same area.
Incorrect (unanticipated): No, that’s incorrect. Keep trying.

State taxes pay for the State government and the services it provides, like State police, public clinics, and employment and training programs. Graphic of check, with just State tax deduction highlighted on paycheck.

Where is the State income tax recorded on this paystub?

Feedback: Yes, your answer is correct. Keep up the good work.
Incorrect (anticipated): All information about taxes for the pay period is usually recorded in the same area.
Incorrect (unanticipated): No, your answer is incorrect. Keep trying.

Social Security is different than the other two taxes. This is money that the government puts away for your retirement years, or sooner if you Graphic of handicapped worker and just FICA highlighted on paycheck.
Social Security is called F.I.C.A. I think of it as Funds I'll Care About when I get older.

April 25, 1989 - kw

become unable to work for health reasons.

Where is the Social Security deduction recorded on this paystub?

Feedback: Yes, that's the right answer. You're doing a good job.
Incorrect (anticipated):
All information about taxes for the pay period is usually recorded in the same area.
Incorrect (unanticipated): No, that's the wrong answer. Try again.

Those taxes are all the required deductions. Then there are voluntary deductions. These include medical insurance, life insurance, union dues, donations to charities, and money for the office coffee fund. These deductions are voluntary, because you have to "volunteer" to have your employer take the money out. They can't do it without your permission.
Box/highlight all the voluntary deductions. (health ins is $5, United Way is $2.00)

What’s left from your gross pay after all deductions is called your net pay. Another word for net pay is take-home pay. I remember "net" by thinking of what I catch in my net (most of the fish). In your net pay you get most of the money. To find net pay, you add up all the deductions, both the voluntary ones and the taxes. Then subtract the total from the gross pay.

What is the total for all the deductions recorded on this paystub?

Feedback: Yes, that’s the correct answer. Congratulations!
Incorrect (unanticipated): No, that’s incorrect. Keep trying.
April 25, 1989 - kw

Feedback: Yes, your answer is correct. Keep up the good work.
Incorrect (unanticipated): No, your answer is incorrect. Keep trying.

What should the net pay be on this paycheck? Text/graphics screen. Number bar question.
1) Suppose you worked 40 hours a week, and made $4.00 per hour. What is your base pay for one week's work?

2) What do you estimate your gross pay will be for one year, if you receive no bonuses, raises or overtime, and make $4.00 per hour?

3) If you make $4.00 per hour, what would your time-and-a-half overtime rate be?

4) How much would you earn in overtime pay, if you work 7 hours overtime and your overtime rate is $6.00 an hour?

5) What would your gross pay be, if you earn $42.00 an hour in overtime pay and $160.00 in base pay?
6) Suppose your boss gave you a 10% bonus on your week's wages of $202.00. How much would you earn in bonus pay?

7) Where is the base pay recorded on this paystub?

8) Where is the Federal income tax recorded on this paystub?

9) Where is the Social Security tax recorded on this paystub?

10) Where is the take home pay recorded on this paystub?
HOST: You know there are lots of forms that we have to deal with here. Most of them have something to do with money. Order forms, deposit slips, account statements, and checks are some of the ones we use most. They all have different purposes and look different. But they are alike because they all have to do with handling money and they are used for a specific purpose that helps the business.

VO: Because these forms have been designed for some particular purpose, they have space for just the information needed. So, the FIRST RULE when you're completing money forms is to fill in all of the spaces on the form. Don't leave anything blank just because you don't know what goes in a space. Ask for help if you need it. The SECOND RULE is that these forms are designed to be easy to complete. They are set up so that you complete them in an order that makes sense. That means that you start at the top and work down toward the bottom of the form.

HOST VO: If you keep these two rules in mind, read the forms carefully, and ask your supervisor for help when you're stuck -- you will be able to complete the money forms you work with. Let's take a careful look now at this order form that I need to complete.
VO: Order forms are used to let businesses know what you want to buy from them. Sometimes orders can be placed over the phone or even in person -- but often, I have to complete an order form and send it in the mail. Luckily, most order forms are pretty much the same and look pretty much like this one. So -- once you know how to fill out one, it's fairly easy to fill out others.

The first step in completing an order form is deciding what to order and -- of course -- how many to order. Here, I'm ordering a few hard to find hardware items to put the finishing touches on our remodelling. First, I want to order 5 more coat hooks for the coatroom.

Once you know the number you want, you enter that number in the column that's usually marked with the words "Item Quantity" or just "Quantity."

Where on the order form would you write the number of coat hooks being ordered?

NARRATOR: Touch the order form at the correct place.
Feedback:
Correct: Yes, your answer is correct. Keep up the good work.
Anticipated Incorrect: For high in another column, No, that's incorrect. Look at the words at the top of each column to make your decision. For low in the correct column, No that’s incorrect. Remember that you begin at the top of your form.
Unanticipated Incorrect: No, that’s the wrong answer. Try again.

VO: The name of the item goes in the column that is usually labelled "item description" or just "description." Where on the order form would you write the word coat hooks?

Feedback:
Correct: Yes, that’s the right answer. You’re doing a good job.
Anticipated Incorrect: For high in another column, No, that’s incorrect. Look at the words at the top of each column to make your decision. For low in the correct column, No that’s incorrect. Remember that you begin at the top of your form.
Unanticipated Incorrect: No, that’s the wrong answer. Try again.
Other information may be required such as a catalog number, a size, or a color. We don’t need this information on this form, but if we did, there would be a column for it.

It’s very important to complete all of the information on the form for each thing you’re ordering. A lot of this information is given in the catalog or other materials you use to place the order. The rest of it can be figured from this information.

The weight and price are usually given in the catalog. So, at the same time you write down the name of the item and the number you want, you can write down the price for one and the weight of one in the correct columns. Often the headings of these columns have the word "unit" in them. Here the columns are called "unit weight" and "unit price".

Some order forms may not ask for weight because they figure the shipping charges in a different way. For instance on this form, shipping charges are based on the total dollar amount of the order.
And, once in a while, shipping is actually free. So, there may be no space for weight. However, if the form asks for weight -- like this one does -- you can be sure that you will need it somewhere along the way. When weight is required, there will also be a column for you to write the total weight for each item. This column is usually labelled "Total Item Weight." Where on the order form would you write the total weight for the coat hooks?

Feedback:
Correct: Yes, you got it right. Good job.
Anticipated Incorrect: For high in another column, No, that’s incorrect. Look at the words at the top of each column to make your decision.
For low in the correct column, No that’s incorrect. Remember that you begin at the top of your form.
Unanticipated Incorrect: No, that’s the wrong answer. Try again.

To find this "Total Item Weight", you just multiply the weight for one from the weight column by the number you’ve ordered. Here, I want 5 coat hooks and each one weighs 2 pounds. What is the total weight for the coat hooks?
Feedback:
Correct: Yes, that’s the right answer. You’re doing a good job.
Anticipated incorrect: No, that’s the wrong answer. You need to multiply to get the correct answer.
Unanticipated incorrect: No, that’s the wrong answer. Try again.

VO: Of course, all order forms require that the price of each thing being ordered is on the form. The amount for one is usually written in a column which may be labelled with the words "unit price", "price each", or just "price." Just as for weight, there is also another column for you to write the total price for each thing you’re ordering. The column for this is usually labelled "total item price", but may also be called just "total price." Where on the order form would you write the total price for the coat hooks?

Feedback:
Correct: Yes, you got it right. Good job.
Anticipated Incorrect: For high in another column, No, that’s incorrect. Look at the words at the top of each column to make your decision.
For low in the correct column, No that’s incorrect. Remember that you begin at the top of your form.
Unanticipated Incorrect: No, that’s the wrong answer. Try again.
Finding the total price for the coat hooks works just the same as finding the total weight for them. Just multiply the price of one coathook by the number you want. Here I want 5 coat hooks and each one costs $7.00. What is the total price for the coat hooks?

If you want to order more than one thing, you just repeat what we did above for each thing you’re ordering -- like this.

<table>
<thead>
<tr>
<th>Item</th>
<th>Weight</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 coat hooks</td>
<td>10 pounds</td>
<td>$7.00 ea $35.00;</td>
</tr>
<tr>
<td>2 light fixtures</td>
<td>16 pounds</td>
<td>$39.50 ea $79.00;</td>
</tr>
<tr>
<td>3 plate racks</td>
<td>18 pounds</td>
<td>$20.00 ea $60.00.</td>
</tr>
</tbody>
</table>

This means that the totals for these columns which are not on this screen are:

- **44 pounds**
- **$174.00**
Once you've written down all the information for each thing you're ordering, you look down toward the lower right hand corner of the order form to find out what you have to do next. Usually, there are several things that you need to fill in down in this section of the form. The most important thing to remember is to start at the top of the block and fill in each figure before trying to go on to the one below it. Usually, the first figure asked for in this block is the "subtotal" or "merchandise total". To find the number to enter in this box, you just add up the "total item prices". These are usually right above the box for entering the subtotal, which makes it easier to do the addition. What is the total price of all the merchandise?

Narrator: Touch the numbers on the bar to answer. When you're done, touch enter.

Feedback:
Correct: Yes, you got it right. Good job!
Incorrect Anticipated: For 62, No, you got it wrong. The total item prices are directly above the box for the subtotal or merchandise total.
Incorrect Unanticipated: No, that's incorrect. Keep trying.
Once you have a subtotal, you look at the box right below it. Here it's the box for the sales tax. Sales tax rates vary from place to place and -- if you're dealing with sales tax -- you'll learn the tax rate for your area. It's not often that you actually have to calculate sales tax. Usually, you will be working with a cash register which computes sales tax or you will have a tax chart like this one.

Although there are a lot of numbers on a tax chart reading one isn't too hard -- once you know how. You locate the amount of your merchandise total in one of the columns -- and then look at the number right next to it. That's the sales tax. Of course, not every amount of money appears on the chart. Usually there are two larger dollar amounts separated by a dash and then right next to them a smaller amount of money. This smaller amount is the tax for any amount of money between the lower and higher numbers. So here, three dollars and seventy cents ($3.70) is the tax for any amount in between seventy-three dollars and eighty-one cents and seventy-four dollars.

Most tax charts only go up to one hundred dollars, but you can still use them to find tax on larger amounts. Our total for merchandise in the subtotal box is one hundred and seventy-four dollars ($174.00). We already know that the tax on seventy-four dollars is three dollars and seventy cents. Now all we have to do is locate the tax for one hundred dollars. That's five dollars even. Then we just add the two tax amounts together to get our total tax. What is the total sales tax for the order?
Feedback:
Correct: Yes, that’s the right answer. You’re doing a good job.
Incorrect Anticipated: For $5.00 or $3.70, No, that’s incorrect. You should have added the sales tax for one hundred dollars and the sales tax for seventy-four dollars together.
Incorrect Unanticipated: No, your answer is incorrect. Keep trying.

VO: When we look below the sales tax space to see what we need to do next, we see a box for shipping charges. Up above, we had to fill in the weight for one of each item and a total item weight for each thing we ordered. Because of that, we can be sure that the shipping charges are based on weight. Since we’ve already figured out the total item weights, all we have to do now to get the total weight for the order is to add them up. What is the total weight for the order?

Feedback:
Correct: Yes, your answer is correct. Keep up the good work.
Incorrect Anticipated: For 10, 16, or 18, No, that’s incorrect. You should have added the three weights in the total item weight column.
Incorrect Unanticipated: No, your answer is incorrect. Keep trying.
VO: As you can see, there's a special place right at the bottom of the Total Item Weight column for this total order weight. This weight can't go in the total block because that block is only for money values.

Once we know the total weight of the order, we need to look at a shipping chart to figure out the shipping charges. A shipping chart is usually included with the packet of materials the company sends out to its customers.

Shipping charts can be a little confusing because shipping charges are based on two things -- the weight of the order and how far away you are from the shipping location. So, you may need to ask someone at work to explain more about the charts you need to use.

To read a chart like this one, you need to know what zone you're in. That depends on how far you are from the shipping location. You will probably need to ask your supervisor for the zone. Here, I know I'm in Zone 1 for this company. So, I just look down the Zone 1 column until I come to the correct weight in the weight column right next to it. Like on the tax chart a weight range is given. Since forty-four pounds is between forty-two and fifty-three pounds, I look at the amount right next to it in the Zone 1 column. What are the total shipping charges for the order?
Feedback:
Correct: Yes, your answer is correct. Keep up the good work.
Incorrect Anticipated: For dollar amounts in the immediate vicinity on the shipping chart, No, that's incorrect. You should have looked in the Zone 1 column right next to the weight range for 44 pounds.
Incorrect Unanticipated: No, your answer is incorrect. Keep trying.

VO: There's only one thing left to do now -- that is find the total or grand total, as it's sometimes called. This is the total amount that you will be paying for your order -- including tax and shipping charges. To find it, you just add everything in the total block together. What is the grand total for this order?

Feedback:
Correct: Yes, that's the correct answer. Congratulations.
Incorrect Anticipated: For any individual amount in the total block, No, that's incorrect. To find a grand total, you need to add together the subtotal, sales tax, and shipping charges.
Incorrect Unanticipated: No, your answer is incorrect. Keep trying.
April 12, 1989 - ER

HOST: I think that order forms are one of the hardest kinds of forms to fill out. Fortunately, some of the others we use aren’t quite as complicated. Like this deposit slip. A deposit slip is just a form to record the amount of money that you’re depositing in a bank account.

VO: As you can see, there aren’t nearly as many spaces on a deposit slip as there are on an order form. Usually the account number is preprinted on the deposit slip. So, you don’t have to worry about writing that in. In fact, there are only 5 things that you need to enter on most deposit slips. Starting at the top again, the first thing is the date you’re depositing the money in the bank.

Second, there is a space for currency. Currency is just another word for bills. So, in the space right next to the word currency, you write the total amount in bills that you’re depositing. I have forty-eight dollars ($48.00) in bills to deposit. Where should you write the total of all the bills being deposited?

Feedback:
Correct: Yes, that’s the right answer. You’re doing a good job.
Incorrect Anticipated: For touch in closeby area, No, that’s incorrect. Another word for bills is currency.
Incorrect Unanticipated: No, your answer is incorrect. Keep trying.
VO: Third - next to the space labelled "coin" you write the total of all the coins you're depositing. I have sixty-three dollars and twenty-two cents in coin to deposit. Where should you write the total of all the coins being deposited?

Feedback:
Correct: Yes, you got it right. Good job.
Incorrect Anticipated: For touch in closeby area, No, that’s incorrect. You should have touched in the area right next to the word coin.
Incorrect Unanticipated: No, your answer is incorrect. Keep trying.

VO: Fourth, look down the deposit slip and you see the word checks. But this time, right after it there are several unlabelled spaces. That’s so you can list each of the checks that you’re depositing separately. You list the amount of each check in the spaces right below the spaces for amounts of coin and currency. In the spaces to the left you write some kind of identification for the check -- like a bank number, a check number, or the name of the company or person who wrote the check. So, for this check from Mr. Martinez, I write Martinez and then $30.00. Where should you record the amount of another check for $15.00.
Audio

Feedback:
Correct: Yes, you got it right. Good job.
Incorrect Anticipated: For touch in correct column but too low, No, that's incorrect. Always work from top to bottom. Don't skip spaces. For touch in identifier column, No, that's incorrect. That's the column where you write something to describe the check -- like the name of the company or person it came from.
Incorrect Unanticipated: No, your answer is incorrect. Keep trying.

VO: Where should you record the name of the person who wrote this second check?

Feedback:
Correct: Yes, that's the right answer. You're doing a good job.
Incorrect Anticipated: For touch in correct column but too low, No, that's incorrect. Always work from top to bottom. Don't skip spaces. For touch in amount column, No, that's incorrect. That's the column where you write the amount of the check.
Incorrect Unanticipated: No, your answer is incorrect. Keep trying.
April 12, 1989 - ER

AUDIO

VO: The only thing left to do now is to add up all of the things you're depositing and write the total in the total box. What is the total amount being deposited?

Feedback:
Correct: Yes, that's the correct answer.
Congratulations.
Unanticipated incorrect. No, you got it wrong.
Good luck next time.

SCREEN

GRAPHIC OF DEPOSIT SLIP just like on assessment disk.
Everything filled in except total. Number bar input.

PROPS, ETC.

PROPS: None
Another form we use quite a bit here at the restaurant is the account statement. Many of our regular customers have a running account with us. That means they don’t pay every time they come in. Instead, we keep a separate record for each customer to keep track of how much they spend and how much they pay. About once a month, most customers send us money. Here’s Mr. Lee’s account statement. Let’s look at it carefully. The first entry has 4 columns filled in: The date column where we write the date each time he comes in to eat; The purchase column where we write the meal that he purchased; The purchase amount column where we put the amount charged for each meal purchased; And finally, there’s the balance due column. We figure this balance due every time a customer makes a purchase or a payment. It’s the amount that they owe on that date. Of course, it changes depending on the purchases and payments the customer makes. So, the last entry at the bottom of the balance due column is the amount that the customer owes right now.

To figure the balance due when the customer makes a purchase, we just add the amount of the purchase to the balance due on the line above. For instance, on April 15th, Mr. Martinez purchased lunch for $17.00. To figure his balance due on that day I added the $17.00 to the balance due on the line right above -- $20.00. So, his balance due then was $37.00. What was the balance due on May 16th?

GRAPHIC OF STATEMENT with entries through May 16th excluding the balance due on May 16th. Things pointed out by arrows and/or yellow boxes as mentioned. Line drawn from purchase to previous balance due with + sign next to it. Number bar entry.
Feedback:
Correct: Yes, that's the correct answer.
Congratulations.
Incorrect Anticipated: For $39, $41, $20, No, you got it wrong. To find the current balance after a purchase, you add the most recent purchase to the balance due from the line above.
Unanticipated incorrect: No, you got it wrong. Good luck next time.

VO: To figure the balance due when the customer makes a payment, we just subtract the amount of the payment from the balance due on the line above. For instance on April 20th, Mr. Martinez paid $35.00. So, to figure his balance due on that day I subtracted $35.00 from the balance due on the line right above -- $37.00. So, his balance due then was just $2.00. What was his balance due on May 19th?

Feedback:
Correct: Yes, that's the correct answer.
Congratulations.
Incorrect Anticipated: For $61, $50, No, that's the wrong answer. To find the current balance, you subtract the most recent purchase from the balance due on the line above.
1) Suppose you wanted to order 15 cabinet knobs. Where on the order form would you begin writing?

2) What is the total item price for the cabinet knobs?

3) What is the total cost for all the items being ordered?

4) What is the sales tax on this order?
5) What is the total weight of the order?

6) If you are in Zone 1, what are the shipping charges for this order?

7) What is the grand total price for the order?

8) Suppose you were making a bank deposit for your employer. Where on this deposit slip would you write the total of all the bills being deposited?

9) Where on this deposit slip would you record the amount of the first check?

10) What is the total amount being deposited?
April 25, 1989 - er

11) Mr. Miller had dinner for 6 on April 14th. What was his balance due after the dinner?

12) Mr. Miller made a payment of $20.00 on April 18th. What was the balance due after he made the payment?
APPENDIX E
Pilot Test Observation and Rating Sheet
Working with Math
A Math Skills Assessment Program
Observation and Rating Sheet for Pilot Test

DIRECTIONS: Observe and interview an individual student who is using the IVD/computer software program, Working with Math. Follow instructions given for each section.

Date ________
Student ID ________
Observer ________

1. Sex M F
2. Age ________ [or range: 20-24 25-29 30-34 35-39 40-44 45-49 50-54]

3. Are you working? N Y If yes: Where or what type of work? ___________________________
How long? __________________________

4. Background information from RCF __________________________

After testing session is completed, engage the student in a brief conversation that allows you to rate the following statements by marking a √ or X in the applicable box:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Student reports enjoying using IVD/computer software.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Student reports wants to use this program again.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Student reports IVD/computer testing is better way to be tested.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Based on your observation and notes, rate the following statements by marking a √ or X in the applicable box:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. Student able to use program by him/herself for content.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. Student able to use program by him/herself for interaction.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Student attends to task.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Student completes each test in one sitting.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mark a √ or X in the applicable box to give a general overall rating for each of the following:

<table>
<thead>
<tr>
<th>Statement</th>
<th>Good</th>
<th>Acceptable</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. Testing atmosphere conducive to testing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Suitability of the IVD/computer materials [5,9,10]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Ease of use of the IVD/computer materials [10,12]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Student attitude during testing session [5,6,7,8,11]</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

E-1

662
Use this side to record observations regarding: behaviors, interactions with the system, interruptions, disruptions, student comments, nature of requests for assistance, etc.

<table>
<thead>
<tr>
<th>Number of requests for assistance</th>
<th>LM</th>
<th>GM</th>
<th>CM</th>
<th>WM</th>
<th>PM</th>
<th>TM</th>
<th>MV</th>
<th>ME</th>
<th>MF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Brief descriptions of requests:

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