DOCUMENT RESUME

ED 262 493

AUTHOR Bull, Kay Sather; Land, Imogene


PUB DATE Mar 85


PUB TYPE Speeches/Conference Papers (150) -- Guides - Classroom Use - Guides (For Teachers) (052) -- Guides - Classroom Use - Materials (For Learner) (051)

EDRS PRICE MF01/PC03 Plus Postage.

DESCRIPTORS *Disabilities; Discovery Learning; *Gifted; *Learning Centers (Classroom); Rural Areas; Secondary Education; Teaching Methods

IDENTIFIERS *Blooms Taxonomy

ABSTRACT

Intended for secondary teachers in rural areas, the paper examines ways to implement a learning center approach to meet a range of students' needs, including mainstreamed special needs, students, regular students, and gifted and talented students. The first section considers B. Bloom's Taxonomy as a basis for developing learning centers. Definitions of each level of the taxonomy are presented along with examples of questions and objectives which illustrate each level (knowledge, comprehension, application, analysis, synthesis, and evaluation). Then 83 ideas for products are offered. The second section discusses the nature of giftedness and talent and covers differentiation of instruction, student contracts, and responsibilities of the regular classroom teacher to the gifted child. The final section addresses concerns for using the approach with special needs students. Suggestions in this section include ways to adjust the work time for the mainstreamed student and the use of peers in the regular classroom. The student guide entitled "Blooming for Vertical and Horizontal Expansion or Creative Obfuscations to Confuse and Bewilder Your Friends" aims to assist the student in writing learning units for other students. It contains exercises and questions related to Bloom's Taxonomy. (CL)
Developing Learning Centers
Utilizing Bloom's Taxonomy
for Secondary Students

Kay Sather Bull
Imogene Land
Oklahoma State University

Presented at the American
Council of Rural Special
Education Conference
Bellingham, Washington, 1985
Introduction

This material is prepared for the secondary teacher that will dare to try something different in the secondary classroom. Secondary teachers in rural America are faced with more responsibility as a result of the national study, "A Nation at Risk." The pressure is on to up grade the skills in the basics, especially math and science. Yet a wider range of students appear in the classes. These changes perpetuate low moral in the teaching profession. What can be done to motivate the secondary student, update the content in the classroom, serve the wide range of student abilities and yet bring some joy into the classroom for both student and teachers? Will you dare to try a non-traditional approach, allowing students to develop centers based on different levels of ability and interest? Make learning happen in a positive atmosphere in your classroom!

In order to meet the range of abilities (the mainstreamed special needs student, the so-called "regular student" plus the gifted and talented) an understanding of Bloom's Taxonomy is helpful. This is one approach that can be utilized for development of learning centers by students for students. It is assumed that all students can use some part of the taxonomy. Section one of this paper deals with Bloom's Taxonomy and development of learning centers. Section two deals with gifted and talented students. Section three deals with the mainstreaming of the special needs student.

Learning centers developed dealing with the content in any subject area will 1) keep information current on the subject; 2) reinforce basic skills in the subject matter area; 3) motivate the students; 4) allow for different levels of instruction in the classroom; 5) get the student involved and 6) even help alleviate teacher burnout!
Using Bloom's Taxonomy

Students with different levels of ability and interest will probably respond differentially when different levels of questions are presented. Gifted, bright and/or highly interested students, in a given content area, are more capable of processing and dealing with analysis, synthesis, and evaluation level questions than their less able or less interested counterparts.

Obviously all students should be expected to be able to answer basic objectives in any content area but the higher level students (in terms of ability and interest) should not be restricted to questions at this level. This is illustrated below:

- **Gifted/Highly Interested**
  - Knowledge
  - Comprehension
  - Application
  - Analysis
  - Synthesis
  - Evaluation

- **Average Ability/interest**
  - Knowledge
  - Comprehension
  - Application
  - Analysis
  - Synthesis
  - Evaluation

- **Slow/Disinterested**
  - Knowledge
  - Comprehension
  - Application

It is generally assumed that the taxonomy is hierarchical, that is the student must be able to perform at the lower level prior to proceeding to higher levels. This is true for contents where the students do not possess any knowledge, but these contents are few and far between. In most cases you can assume that more able and more interested students will have more knowledge and experience with the content than other students and therefore you can expect these students to enter the content at initially higher levels.

On the following pages definitions of each level in the taxonomy are presented, along with examples of questions and objectives which are illustrative of each level. Following this are ideas for products which students could produce which, in many cases, go beyond paper and pencil tasks.
KNOWLEDGE

Knowledge is defined as the remembering of previously learned material, the answering of questions solely by rote memory. This may involve the recall of a wide range of material, from specific facts to complete theories, but all that is required in the bringing to mind of the appropriate information. Knowledge represents the lowest level of learning outcomes in the cognitive domain.

**Verbs**

- Define
- Draw
- Repeat
- Record
- Recall
- Recite
- Recognize
- Write
- Memorize list
- Name
- Relate
- Choose
- Find
- Arrange (in learned order)
- Label
- Select
- Match
- Omit
- Underline
- Quote
- Say
- Touch
- Identify
- Hold
- Check
- Rehearse
- Affirm
- Associate
- Copy
- Group
- Indicate
- Point out
- Locate
- Pickup
- Point
- Enumerate
- Reproduce
- Distinguish
- Acquire

**Example Questions/Objectives**

- Define the term family
- Define the term family, the reproductive organs of a flower.
- What did the book say about ________.
- Can you recall what the author said about ________.
- Recite the Gettysburg Address.
- Which of these tools (hold up several) is a crescent wrench?
- List the bones in the leg.
- What is the name of this object (hold up object)?
- Who invented the ________.
- Choose between these two blocks, the one which is larger.
- Find the location of Paris on the map at the front of the room.
- Can you arrange the parts of the skeleton in the correct order?
- Can you label the parts of the diagram?
- Select the verb in this sentence.
- Underline the noun in the sentence.
- Can you quote what the book says on this matter?
- Can you say the Spanish word for work?
- Can you identify the verb in this sentence? (give sentence)
- Point out the location of your nose.
- Will you locate the 40th meridian on the globe at the front of the room?
- Can you distinguish between ________ and ________?
3. What is the capital of Kentucky?
   Name the major Indian tribes in Oklahoma in 1840.
   What two types of reasoning are used in the study of mathematics?
   What is the algebraic symbolization of the Pythagorean theorem?
   How many states are there in the United States?
   How does a plant get water?
   What are the three important rules to follow in using the comma?
   What is the proper form for writing a friendly letter?
   Who is the author of Make Way for Ducklings?
   How do you determine the miles per gallon a car is getting?
   What name is commonly given to the idea expressed by \( a + b = b + a \) in mathematics?
   List the main characters and their roles in The Hobbit?
   What is a synapse?
   What is free verse?
   What is an isotope?
   What state grows the most lettuce?
   How do you spell Mississippi?
   What steps does one follow in directing a bill through congress?
   To what classification does the silk moth belong?
   What are the three criteria by which we can assess the quality of a television program?
   What are the basic steps in organizing a term paper?

**COMPREHENSION**

Comprehension is defined as the ability to grasp the meaning of material. This may be shown by translating material from one form to another (words to numbers), by interpreting material (explaining or summarizing), and by estimating further trends (predicting consequences or effects). This type of question requires students to restate a problem in their own words, to give an example of a principle or concept, to qualify statements, to extrapolate trends into the past or future, or to point out implications or consequences. These learning outcomes go one step beyond the simple remembering of material, and represent the lowest level of understanding.

<table>
<thead>
<tr>
<th>Verbs</th>
<th>Example questions/objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classify</td>
<td>Classify these plants into broad leaf or narrow leaf varieties.</td>
</tr>
<tr>
<td>Compare</td>
<td>Compare the books (list books) and tell why they are similar and different.</td>
</tr>
<tr>
<td>Contrast</td>
<td>Contrast the meter of the poems (supply poems).</td>
</tr>
<tr>
<td>Describe</td>
<td>Describe the reaction which you get when you mix vinegar and soda.</td>
</tr>
<tr>
<td>Discuss</td>
<td>Discuss the feelings that Huck Finn had when his father lock him in the room.</td>
</tr>
<tr>
<td>Interpret</td>
<td>Interpret the results of the experiment we just performed.</td>
</tr>
<tr>
<td>Translate</td>
<td>Translate this definition (give definition) into your own words.</td>
</tr>
<tr>
<td>Change</td>
<td>Rewrite this statement (supply statement) so that it is correct.</td>
</tr>
</tbody>
</table>
Expand on the rule (supply rule) by providing 3 examples.
Transform the sentence from active to passive voice.
State in your own words.
Retell the story we just read in your own words.
Convert 16 feet 6 inches into meters.
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
What do you infer is going to happen next?
APPLICATION

Application refers to the ability to use learned material in new and concrete situations. This may include the application of such things as rules, methods, concepts, principles, laws, and theories. The knowledge must be successfully used under conditions that differ from those in which it was first learned or encountered.

VERBS

Apply
Calculate
Complete
Demonstrate
Illustrate
Practice
Solve
Use
Employ
Dramatize
Show
Operate
Exhibit
Adopt
Try
Manipulate
Mobilize
Devote
Handle
Wield
Put to use
Exploit
Put in action
Exert
Consume
Take up
Capitalize
Construct (follow diagram)
Teach
Paint
Sketch
Interview
Record
Simulate
Classify

Example Questions/Objectives

Apply the formula to this problem and tell me the correct answer.
Calculate the answer using the appropriate procedure.
Can you complete the statement?
Demonstrate how you would skin a hog.
Illustrate the neural network which is presented on the slide.

Solve the following problems.
Use formal logic in developing your answer.
Can you dramatize the interaction which took place between the two men?
Show me how to set up the microscope.
Operate the band saw, using appropriate safety techniques.

Manipulate the microscope controls to set the magnification at 100X.

Teach the concept of ______ to the class.
Paint a picture of the fruit in the bowl.
Sketch a diagram of the muscles in the human hand.
Interview your team mate on the following topic (indicate topic).
Simulate the behavior of a ______.
Classify these fossils into groups based on skeletal type.
How can you explain the fact that there is a desert region to the east of the Cascade Mountains?
How was the life of an Oklahoma Indian circa 1840, similar to the way in which people live today?
If a man drives to town at the rate of \( X \) mph and returns along the same route at \( Y \) mph, what is his average rate?
Two of the four plates on Mrs. Jones' electric stove have burned out. How will this affect the time involved in preparing a four course dinner for her dinner guests tonight?
Where should punctuation marks be placed in the following sentences?
Relate Bilbo Baggins's ambivalent feelings toward his adventure of the ring to your own feelings about the first day of class in a new school.
If Tom Sawyer can paint a fence alone in three days, how long will it take him if he has three friends to it for him, assuming each friend can work at the same speed as Tom?
Mr. Jones wishes to purchase a new carpet for his living room. The room measures 18 feet by 20 feet. How much carpet will Mr. Jones need to purchase?

**ANALYSIS**

Analysis refers to the ability to break down material into its component parts so that its organizational structure may be understood. This may include the identification of the parts, analysis of the relationships between parts, and recognition of the organizational principles involved. Finding assumptions, distinguishing facts from opinion, discovery causal relationships, finding fallacies in stories or arguments, specifying the style of a written or unusual piece, or inferring the author's purpose are items that require analysis. Learning outcomes here represent a higher intellectual level than comprehension and application because they require an understanding of both the content and the structural form of the material.

**VERBS**

<table>
<thead>
<tr>
<th>VERB</th>
<th>Example Questions/Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analyze</td>
<td>Analyze the solution in the test to be and determine its chemical composition.</td>
</tr>
<tr>
<td>Classify</td>
<td>Classify the samples of soil, using a ph test, into acid, alkaline and neutral soils.</td>
</tr>
<tr>
<td>Discuss</td>
<td>What was the author's purpose, bias, or prejudice?</td>
</tr>
<tr>
<td>Divide</td>
<td></td>
</tr>
<tr>
<td>Explain</td>
<td>What must you know for that to be true?</td>
</tr>
<tr>
<td>Infer</td>
<td>Infer which of the components is malfunctioning given the following input (give input).</td>
</tr>
<tr>
<td>Inspect</td>
<td>Inspect the food processing facility and prescribe the vermin eradication measures necessary.</td>
</tr>
<tr>
<td>Separate</td>
<td>Separate the main from the subsidiary characters in the book.</td>
</tr>
<tr>
<td>Sort</td>
<td>Sort these vegetables according to ________.</td>
</tr>
<tr>
<td>Differentiate</td>
<td>Which are facts and which are opinions?</td>
</tr>
<tr>
<td>Experiment</td>
<td></td>
</tr>
<tr>
<td>Compare</td>
<td>Compare (list similarities and differences) the two characters in ________.</td>
</tr>
<tr>
<td>Process</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>Contrast</td>
<td>Contrast (list differences) the two methods.</td>
</tr>
<tr>
<td>Scrutinize</td>
<td>Investigate the relationship between plant growth and fertilizer application.</td>
</tr>
<tr>
<td>Probe</td>
<td>Discover what is missing in this diagram.</td>
</tr>
<tr>
<td>Investigate</td>
<td>Can you detect the power shift using a _____ on this piece of equipment.</td>
</tr>
<tr>
<td>Discover</td>
<td>Examine this specimen and classify it based on its attributes.</td>
</tr>
<tr>
<td>Inquire</td>
<td>Dissect the frog and illustrate what you find.</td>
</tr>
<tr>
<td>Detect</td>
<td>Simplify this mathematical statement.</td>
</tr>
<tr>
<td>Examine</td>
<td>Breakdown the solution into its component parts using a centrifuge.</td>
</tr>
<tr>
<td>Survey</td>
<td>Categorize the stories into fiction, biography, etc.</td>
</tr>
<tr>
<td>Dissect</td>
<td>Diagnose the fault in _____ .</td>
</tr>
<tr>
<td>Simplify</td>
<td>Divide this expression into its component parts.</td>
</tr>
<tr>
<td>Search</td>
<td>Isolate the critical incident in the chapter which changed the way the character viewed the world.</td>
</tr>
<tr>
<td>Survey</td>
<td>Measure the impact of the statement on your classmates.</td>
</tr>
</tbody>
</table>

Are the author's conclusions substantiated by evidence?
How did Indian families, in Oklahoma, circa 1840, divide the daily work?
Which of the statements in the proof are not properly supported?
What is the theme that recurs throughout this musical arrangement?
Study the diagram and given information. What information is fact and what must be proved?
Which section of the orchestra essentially carried the theme in the last piece?
What have we assumed to be true if we accept these conclusions?
What generalization is the author making about the people of Western Europe?
Which of the statements in the report are irrelevant to the author's conclusions?
Which of the propaganda techniques given by the author apply to this advertisement?
How is the judge's sentence related to the defendant's wrong-doing?
From our discussion of human behavior, what are two basic assumptions we must accept regarding people?
Does the data support the hypothesis that women are not treated equally?
What do you think was the artist's reason for painting this picture?
"Some people are more equal than others." Describe the process by which the individual who voiced this phrase arrived at his conclusion.
Synthesis refers to the ability to draw together ideas or materials from different sources and to put the parts together to form a new whole. This may involve the production of a unique communication (theme or speech) a plan of operations (research proposal) or set of abstract relations (scheme for classifying information). Learning outcomes in this area stress creative behaviors, with major emphasis on the formulation of new patterns or structures which are designed to be communicated to others.

**VERBS**

Arrange (new way)
Combine
Construct
Create
Design
Develop
Generalize
Organize
Plan
Predict
Prepare
Compose
Propose
Produce
Invent
Formulate
Assemble (new way)
Build
Set up
Originate
Contrive
Concoct
Systemize
Blend
Reorganize
Make
Generate
Evolve
Constitute
Breed
Compile
Make up
Form
Imagine
Extrapolate
Hypothize

**Example Questions/Objectives**

Arrange the components into a new model.
Combine these two ideas into a metaphor.
Construct a model which illustrates the way in which the process works.
Create a story which illustrates your viewpoint or the subject.
Design the alternative method to ________.
Develop an alternative way to doing ________.
Generalize this concept (provide concept) to other situations.
Organize these ideas into a meaningful structure.
Present a plan to do ________.
Predict the outcome(s) based on the information which has been developed in ________.
Prepare a new approach to ________.
Compose a (music, art, etc.) piece.
Propose a new method by which ________.
Produce a product.
Invent something which will ________.
Formulate a new procedure which will ________.
Assemble the data, in a new way.
Build a model which represents ________.

What would you do if ________?

Systematize the information according to your own internal representatives of ________.
Reorganize the information to support your viewpoint or argument.
Make a ________ to ________.
Generate a (piece, product, etc.) using the ________.

Compile a review of the literature on ________.

If no one else knew, how could you find out?
What recommendations would you make to improve the air pollution problem in large cities?

What would an Indian family (Oklahoma; circa 1840) need to do to move?

How would you plan to teach a unit on geometric construction?

What would the world be like if we had no unique mathematical operations?

What would be the most important questions to ask in determining a solution to this problem?

How could the story have ended differently?

How many different uses of the coat hanger, other than hanging clothes, can you name?

Can you devise a set of rules for the first group of settlers on the moon?

Based on our study of the development of the African counties, what predictions can you make about the political future of Tanzania?

How might the days or seasons differ if the earth was in the shape of a pyramid with a square base? Assume that the earth revolves on its own axis and rotates around the sun.

How can you best communicate your feelings about freedom?

How can we get community support for a peer drug counseling program?

From our experiments with plants and different types of soil, what statement can we formulate regarding plant growth?

Drawing on your experiences in school, how do people view education in this country?

EVALUATION

Evaluation is concerned with the ability to judge the value, quality, or correctness of material (statement, novel, poem, research report) for a given purpose. The judgments are to be based on definite criteria. These may be internal (organization) or external criteria (relevant to the purpose) and the student may determine the criteria or be given them. Learning outcomes in this area are highest in the cognitive hierarchy because they contain elements of all of the other categories, plus conscious value judgements based on clearly defined criteria.

VERBS

Example Questions/Objectives

- Appraise
  - Appraise the value of ________

- Assess
  - Assess the viability of ________

- Critique
  - Critique the article, based on the teacher developed checklist.

- Estimate
  - Estimate the results taking the course of action.

- Evaluate
  - Evaluate the merits of ________

- Grade
  - Grade the level of quality of ________

- Judge
  - Judge, based on internal criteria, the worth of ________

- Rank
  - Rank the merits of ________

- Rate
  - Rate the products based on ________

- Recommend
  - Test, using the experimental method, the hypothesis of ________

- Test
  - Which of the books would you consider of greatest value?

- Decide
  - Conclude whether or not the hypothesis should be rejected.

- Compare
  - Select the best ________ based on internal/external criteria.

- Revise

- Judge

- Select
Which policy will result in the greatest good for the greatest number?

For what reason would you favor _____?

Determine the merits of the arguments.

Based on the criteria of effectiveness and economy of time, effort, and money, what would be the best solution to the middle east conflict?

What are the good and bad aspects of being a member of a nomadic group?

Was Rene Descartes a better philosopher than a mathematician?

Is the construction of this geometric figure an accurate representation of the given information?

Which of the three pictures has the best color combination?

What conclusion can be justified in the selection read?

Is this the most appropriate art form to depict the subject?

What best justifies the action taken by the countries presently being studied?

Was this event accurately reported by the correspondent?

Indicate in what ways this is a beautiful poem?

According to the stated situation, which is the most appropriate move that man could take?

What do you think could happen if the Berlin Wall were torn down and the barriers were removed?
The following are illustrative of products which the students can be asked to develop. You should try always to have students develop some product as the result of doing a Bloom's objective.

1. a letter
2. a lesson
3. advertisement
4. annotated bibliography
5. art gallery
6. block picture story
7. collage
8. collection
9. collection w/illustration
10. chart
11. choral reading
12. comic strip
13. cooked concoction
14. crosscut diagram
15. crossword puzzle
16. debate
17. demonstration
18. detailed illustration
19. diorama
20. display
21. editorial
22. essay
23. experiment
24. fact file
25. fairy tale
26. family tree
27. filmstrip
28. flip book
29. game
30. glossary
31. graph
32. hidden picture
33. illustrated story
34. jigsaw puzzle
35. labeled diagram
36. large scale drawing
37. learning center
38. letter to the editor
39. map
40. map w/legend
41. mini-center
42. mobile
43. mural
44. museum exhibit
45. model
46. oral report
47. pamphlet
48. photo essay
49. pictures
50. pictures dictionary
51. picture story for children
52. poem
53. porta-center
54. poster
55. project cube
56. puppet
57. puppet show
58. rebus story
59. riddles
60. scavenger hunt
61. science fiction story
62. scrap
63. sculpture (clay, wire, junk)
64. seek and find
65. skit
66. small scale drawing
67. song
68. songs (collection)
69. stencil
70. story
71. street map
72. survey
73. tape
74. terrarium
75. text book
76. time line
77. transparency for an overhead projector
78. travelogue
79. TV news report
80. video tape
81. vocabulary list
82. worksheet
83. written report
Developing Learning Centers

1. Prepare directions for the students (insure that the students can function independently using the center).
   a. Make the directions clear and legible.
   b. Use terminology familiar to students.
   c. Use audio-visual aids to help students understand directions, if necessary.
   d. Include enough organizational information to enable students to work independently.
   e. Include examples of tasks to be accomplished, when appropriate.
   f. Include the objectives and/or purpose of the center.
   g. Include information about evaluation, the students should be able to correct their own answers for knowledge and comprehension levels.

2. Clearly state the objectives--help students be more purposeful, better organized, better able to determine when they have reached the objective. It is imperative that the students know what they are to do and under what conditions and standards, if conditions and standards are to be imposed.

3. Tell the students that they may choose among the objectives offered (in Bloom's units). This promotes individualization, interest, and motivation. They can do as many or as few as you will allow.

4. Centers (ala Bloom) are multi-level activities which provide information at a variety of levels which make them suitable for students at many levels of ability, interest, and age. It is well to remember that the purpose of individualization is to allow the student:
   a. choice of content based on interest.
   b. to control the rate of progress.
   c. to work at an appropriate level.

5. Provide as many manipulative/constructive activities as possible as well as paper and pencil activities. Knowledge and comprehension level items do not always have to be define and restate things.

6. Advantages of Bloom's taxonomy learning centers.
   a. All students can use the centers.
   b. Slower students will tend to choose knowledge and comprehension level objectives.
   c. Gifted students will tend to operate at the higher levels.
   d. All students can choose what they will do within the center (the level at which they will approach the material).
   e. All students will create some sort of product.
   f. Each student can proceed at his/her own best pace.
   g. Assuming that centers are curriculum related, all students will operate on the same content, although the levels will differ.
Writing Bloom's Centers

1. Centers without content (the student must create, use the library or other sources for content.
   a. Determine what the content is to be -- should be related to the scope and sequence of the area you teach (either vertical or horizontal expansion).
   b. Determine the kinds of behaviors which you wish the students to have as alternatives at each level. (See verb lists)
   c. Determine the kinds of products which the students should develop for each objective, products produced should be of a kind that are sharable with other students. (see product lists)
   d. Determine if center is to be part of a larger center or if it is to stand alone. If yes, then format according to the format of the larger center.
   e. Identify creative formats for packaging center.
      1. Determine size
      2. In a folder? More creative format, e.g., trash can, shoe, etc.
      3. A folder with pockets?
      4. Reference card?
      5. Self-checking card for knowledge and comprehension? Red acetate pocket?
      6. Bibliography? In a pocket?
      7. Task cards? On a ring? Cut in different shapes?
      8. Backboard?
      9. Are pictures available to illustrate folder or backboard?
     10. In a note book with other centers?
     11. Identifier tab, if designed for file drawer?
     12. Insure that formats are self checking and self evaluating where possible.
   f. Indicate whether or not a contract is necessary and the form that it should take, if it is required.

2. Centers developed around pictures, posters, maps, other graphics (with or without text).
   a. Items A-F from number 1.
   b. Examine graphic and isolate those things which would be focal stimuli for objectives.
   c. Read text (if any) for possible objective ideas.
   d. Determine if focal stimuli can be used for objectives at several levels.
   e. Write questions (objectives) about the entire graphic.
   f. Consider asking global questions about the graphic which are related but not necessarily drawn directly from it, e.g., a question about the time that a picture was painted or about the artist. Remember it is perfectly acceptable to have the student do research which goes beyond the visual.
   g. Determine the kinds of knowledge and comprehension questions which can be asked. Determine if you can make these self-checking.
   h. Look at creative ways of formulating the graphic
      1. Rolled and laminated
      2. On a fold up backboard
      3. On a window shade
      4. In a picture frame (multiple graphics in a poster display rack.)
      5. As a scroll
      6. On poster board
      7. On a slide (for a slide projector)
3. Centers developed around articles or other text content.
   a. Items A-F from number 1.
   b. If article has pictures A-H from number 2.
   c. Determine if the knowledge and comprehension items will be drawn from content beyond the text, e.g., define words using a dictionary.
   d. Determine format for knowledge and comprehension questions.
   e. Determine how many objectives at each level are appropriate for the amount of content.
   f. Look carefully at the relationship between text and picture so that both can be tied to questions or objectives.
   g. Determine how the article(s) will be bound
      1. Rubber tape
      2. Stapled
      3. Spiral bound
      4. Glue and edge
      5. With or without cover page
   h. Determine how article will be packaged once bound
      1. In folder
      2. In spiral or 3-ring notebook
      3. In pocket or backboard
   i. Determine packaging if article is one of several for the center.
   j. Determine how task cards or objectives how ever formatted will be related to the article(s).
Gifted and talented children are those identified by professionally qualified persons who, by virtue or outstanding abilities, are capable of high performance. These are children who require differentiated educational programs and/or services beyond those normally provided by the regular school program to realize their contribution to self and society.

Children capable of high performance include those with demonstrated achievement and/or potential ability in any of the following areas, singly or in combination:

1. General intellectual ability
2. Specific academic aptitude
3. Creative or productive thinking
4. Leadership ability
5. Visual and performing arts

Mainstreaming

Definition: The process of providing the most appropriate education for each child in the least restrictive environment (The environment which is most facilitative in terms of learning goals.) Gearhart, 1980.

Students should be mainstreamed into a class when they are operating at a different cognitive or skill level if they are provided with differentiated educational experiences and they are NOT required to perform with the group, e.g., the student works on independent study, correspondence courses, learning centers, etc., as defined in the student's educational plan.

Differentiating Instruction

Acceleration -- Going faster through the course content. Repetition is reduced; only must know and need to know information is presented. Content taught is based on student entry level from diagnostic testing. Usually used as a base for their forms of differentiation.

Vertical Expansion -- Affording opportunities to elaborate on the regular curriculum through additional allocation of working time, materials, experiences, etc. Involves the development of higher level thought processes (Bloom levels) or higher levels of skill related to regular curricular content.

Horizontal Expansion/Integration -- Providing opportunities to deal with a greater breadth of material related to the regular curriculum and/or the integration of two or more curricular areas to facilitate transfer and integration.

Parallel Track Curricula -- Exposure to a new curricular area not normally taught in school which has a coordinated scope and sequence of several years in length, e.g., philosophy, thinking skills, affective education, etc.
Interest Based Research or Independent Study -- Activities in which the student becomes an actual investigator of a real problem or topic using appropriate methods of inquiry.

Horizontal Enrichment -- Exposure to experiences, material or information which is unrelated to the regular curriculum and is not normally presented at a given grade level, to provide a broader data/experience base.

**SHOULD DISTRIUTION FOR THE GIFTED HAVE A GOAL WHICH IS RELATED TO SOME SET OF SEQUENCED EXPERIENCES?**

**Possible Options**

**YES**
- Acceleration
- Vertical Expansion
- Horizontal Expansion/Integration
- Parallel Track Curriculum

**NO**

1. Games to keep busy.
2. Isolate projects to keep them busy.
3. Isolate learning centers.
4. A constant diet of field trips.
5. Work in the school office.
6. Horizontal enrichment

**Yes or No**

Interest Based Research
RESPONSIBILITIES OF THE REGULAR CLASSROOM TEACHER TO THE GIFTED CHILD

G/T Program--Mainstreaming
1. Provide differentiated education (vertical/horizontal expansion and/or acceleration) in all areas where the child is identified as gifted.

2. Do not expect the G/T child to participate in competitive group work in gifted areas (cooperative grouping is sometimes appropriate).

3. Expect the child to spend as much time/effort as the normal child on areas where he/she is NOT gifted.

4. Expect at least grade level performance in non-gifted areas.

G/T Program--Pull out (academic areas)
1. If the child is not pulled out totally in an academic area, provide differentiated education in that area where the child is present.

2. Expect the pullout teacher to provide grading in pullout academic areas.

3. Do not expect the child to do regular classwork in pullout areas.

4. Expect the pullout teacher to provide and you to use differentiated materials in the pullout areas.

G/T Program (Pullout--special program, e.g., olympics of the mind: Philosophy, etc.)
1. Repeat 1-4 from mainstreaming.

2. Do not expect the child to spend additional time in or out of class to make up differentiated instructional time missed going to pullout program.

NOTE: In all gifted areas, instruction should be individualized. Differentiated and probably accelerated if it is to be considered appropriate according to state law and gifted educational theory.
The contract learning system is a favorite of students and teachers because:

1. It provides a student/teacher centered as opposed to teacher/centered method of learning.
2. The student and teacher know beforehand what is to be learned and completed.
3. The student and teacher plan together (negotiate as equals).
4. The teacher is free to help more students.
5. The student has more freedom to be creative through self-directed learning.
6. Record keeping is easily facilitated.

Directions to Students who are Creating a Contract

1. Explain what it is that you like to learn. (You may choose from a list given in class and/or you may suggest something else). Be sure to include some ideas of how much of it you wish to learn.
2. Try to explain what you expect to gain by learning this. What's the personal benefit to spending your time on this subject?
3. List below as many strategies (ways, methods, activities) which you might employ in order to learn what you have chose. Put a star (*) next to the ways which seem best or most pleasant to you.
4. Is there some kind of product which you can produce which might be a good way of ending your study (a paper, play, painting, poem, lesson you would teach, etc.) Could you share your learning in some way with others in the class?
5. In our school we have to give each student a grade at the end of each "Marking Period." In order to make this more fair, you can help by suggesting below some criteria (Standards) by which the teacher will be able to rate your learning. The teacher will help with this. Indicate what specific things the teacher should look for, also indicate what combination of things will earn an "A" or "B", etc.
6. Some people work best when they have a deadline, and others work best without one. Which pleases you most? If you wish a deadline, set one here. What penalties (if any) should there be if you do not meet your deadline?

Contracts might include:

- Student's name
- Date
- Contract title
- Time line
- Evaluation terms
- Day and time for conferences
- Teacher's name
- Grade level
- Objectives
- Methods of completing tasks
- Date for completing contract
- Student and teacher signature
In working with students with special needs, teachers are faced with several academic decisions in planning for the individual differences of each one:

1. Adaptive instruction refers to changes made by the teacher in materials, environment, etc. which enable a student to function more effectively in the classroom. It is generally not the intention of an adaptation to remediate or change a difficulty, but to provide the student with a means of coping with the problem in a given individual situation. The greatest percentage of changes made in classrooms are adaptations of instruction to meet individual needs as they arise.

2. Compensatory instruction refers to teaching the student ways of getting around a specific problem. The focus on compensatory instruction is to give the student a technique which can then be applied in other situations where the problem is likely to occur. For instance, if a student has difficulty remembering instruction, the compensation might be to teach the student to outline or to jot down key words to aide memory.

3. Remedial instruction refers to the re-teaching of specific concepts and/or skills which are required of the student for effective classroom performance. For instance, if a student can add, has subtraction skills but is confused about regrouping, can multiply hesitantly, and has some beginning division skills, then the program is a remedial one in that the teacher will focus on those skills which the student lacks, while working to strengthen those skills which the student has.

4. Developmental instruction is required for some students, especially those who either follow a more or less normal curriculum sequence or need an alternative curriculum from the average of their peers. The major focus here is on progress of materials and techniques at the students' levels and systematic, sequential instruction of the selected curriculum.
Section Three
Suggested Teaching Strategies for Dealing with the Mainstreaming Student

1. Adjust work time for the mainstreamed student by:
   a. giving the student longer time to complete assignments.
   b. letting the student work at reading and writing assignments for short periods of time, perhaps just ten or fifteen minutes depending on his ability to concentrate, followed by other types of activities for short periods of time.
   c. setting up a specific schedule for the student so that they know what to expect; being physically close to them if you have to change or vary their routine.
   d. keeping work periods short; gradually lengthening them as the student begins to cope.
   e. alternating quiet and active time; having short periods of each; making movement as purposeful as possible.

2. Use of peers in the regular classroom:
   a. having students drill aloud to themselves or to another student.
   b. dictating information into a recorder or another student.
   c. having another student read important information to mainstreamed student.
   d. having students read important information aloud to themselves or to another student.
   e. having students re-auditorize silently, vocalizing material inside their heads and later discuss with a peer.

3. The resource room teacher and the regular classroom teacher communicate informally a minimum of once every two weeks to discuss progress and share experiences of the mainstreamed student.

4. Schedule students into classes, where possible, that are taught by teachers who are willing to modify their requirements to meet the needs of handicapped students.

5. Demonstrate techniques that may be used for the entire class but which will specifically aid the LD student.

6. Provide tape recordings of textbooks or chapter summaries (possible an in-class small group activity, or can be done by accelerated learner or tutor).

7. Communicate with parents concerning child's strengths and weaknesses, progress or lack of progress, conflicts or problems at school. (Keep sample of students work)

8. Demonstrate new types of materials and testing equipment that would benefit the regular classroom teacher.

9. Arrange for mainstreamed students to pre-enroll in classes where they will have the best chance to succeed before regular enrollment closes those classes.
10. Establish planning sessions between student, counselor, and resource room teacher to select most likely schedule arrangements.

11. Share materials and audio-visual equipment.

12. To utilize audio-visual aides as alternative approaches to vocabulary development, etc.

13. Communicate at least one good thing about the student to the parent during the school term. This may be a conference, note, or phone call.

14. Utilize role playing as a means of affective development for all students (especially LD) in the regular classroom.

15. Provide a modified prescription for use by the regular classroom teacher in the content area. (The resource room teacher could be responsible for this.)

16. Monitor student adjustment to mainstreamed class.

17. Make arrangements for LD students to take their test from the regular classroom to the resource room where they can take it without distraction.

18. Make arrangements for resource room teachers to read tests to students who are unable to read or comprehend written questions effectively.

19. Allow students to answer test questions via alternative methods (tape recording, visual display, etc.) provided their learning disability hinders them from taking the test in the normal fashion.

20. Make special arrangements in regular class to minimize effects of distractibility, short attention span, or inability to follow verbal instructions.
Blooming for Vertical and Horizontal Expansion or Creative Obfuscations to Confuse and Bewilder your Friends

A Student Guide to Bloom's Taxonomy

Kay Sather Bull
Imogene Land
Oklahoma State University

Presented at the American Council of Rural Special Education Conference, Bellingham, Washington, 1985
Introduction

The purpose of this booklet is to assist you in writing learning units for other students in areas where you are interested. You have been selected to help create materials because (you may pick only one) 1) you are smart; 2) you are a smart mouth; 3) you are as smart as . . . ; 4) you are free this hour; 5) you are inexpensive this hour. Seriously, this booklet is designed to help you help yourself and others to examine and work with materials at a level that is higher than rote regurgitation (otherwise known as the puke-back method).

So what is this method and is it any fun? Fun, well that depends on how perverted you are! The method: Bloom's Taxonomy

```
Evaluation
Synthesis
Analysis
Application
Comprehension
Knowledge
```

The idea behind Bloom's Taxonomy is that there are very limited number of ways in which you can deal with or process information. These are represented in the pyramid as six levels; levels of complexity of process that is.

Let's define these six levels so that we can better see what we are talking about. Knowledge is defined as the remembering of previously learned material, the answering of questions solely by rote memory. This may involve the recall of a wide range of material, from specific facts to complete theories, but all that is required is the bringing to mind of the appropriate information. Knowledge represents the lowest level of learning outcome in the cognitive domain.

The student who is performing at the knowledge level does the following kinds of things: (1) Responds to classroom situation (stays awake, looks at teacher with glazed eyes); (2) Absorbs information -- looks, listens, reads; (3) Remembers (only those things taught in class, other rememberings called daydreaming); (4) Practices procedures -- drills, recites (regurgitates); (5) Covers information in books (preferably with a waterproof cover before regurgitation); (6) Recognizes information that has been covered (no matter what it is covered with.).

The second level in the Taxonomy is Comprehension: defined as the ability to grasp the meaning of material. This may be shown by translating material from one form to another (words to numbers), by interpreting material (explaining or summarizing), and by estimating further trends (predicting consequences or effects). This type of question requires the respondents to restate a problem in their own words, to give an example of a principle or concept, to qualify statements, to extrapolate trends into the past or future, or to point out implications or consequences. These learning outcomes go one step beyond the simple remembering of material, and represent the lowest level of understanding.
The student who is performing at the comprehension level can do some or all of the following: (1) Explain information rather than merely quote it (this is the level the principal is at when he shrieks, "Do you understand what I mean?"); (2) Makes simple demonstrations (rioting and cross burning are excluded); (3) Translates information into his/her own words (when caught this is known as plagiarism); (4) Extends information to new situations; (5) Interprets information from technical to familiar terms (a pedagogue is a _______).

In the following section 5 objectives are presented. To test your Knowledge and Comprehension please indicate whether the objective is at the (K) Knowledge or (C) Comprehension level or if it is at (N) Neither level. Place a check mark in the space below the correct letter. Answers are at the bottom of the page.

<table>
<thead>
<tr>
<th>Objective</th>
<th>K</th>
<th>C</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Define the term pedant.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Compare the pedant to the pedagogue.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Recite the Gettysburg Address.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Give an example of pedantry.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Manipulate the controls, of the microscope, to set the magnification at 100X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The third level in the Taxonomy Application, refers to the ability to use learned material in new and concrete situations. This may include the application of such things as rules, methods, concepts, principles, laws, and theories. The knowledge must be successfully used under conditions that differ from those in which it was first learned or encountered.

The student who is performing at the application level does some or all of the following: (1) Solves novel problems (given a tube of super glue, how can you keep the teacher from giving the test she has in her desk drawer; (2) Constructs projects, models, apparatus, etc. (Dr. Frankenstein I presume); (3) Demonstrates use of knowledge (Disrobe a ... [it better be a manikin or you are in real trouble]).

The fourth level of the Taxonomy is Analysis which refers to the ability to break down material into its component parts so that its organizational structure may be understood. This may include the identification of the parts, analysis of the relationships between parts, and recognition of the organizational principles involved. Finding assumptions, distinguishing facts from opinion, discovery causal relationships, finding fallacies in stories or arguments, specifying the style of a written or unusual piece, or inferring the author's purpose are items that require analysis. Learning outcomes here represent a higher intellectual level than comprehension and application because they require an understanding of both the content and the structural form of the material.

Answers: 1-K, 2-C, 3-K, 4-C, 5-N
The student who is performing at the analysis level does all or some of the following: (1) Discusses information in depth (will the Alvin discussion group please meet at the forward hatch); (2) Uncovers interrelationships among ideas (now remember we said ideas, not people); (3) Discovers deeper meanings and insitutions not apparent at first (tag line on a letter of recommendation, "all of the above apply except where Mr. Jones has been drinking.") (4) Sees similarities and differences between styles (Michael Jackson and Lawrence Welk you say . . .).

Here is another practice exercise. See how many objectives you can categorizes as (K) Knowledge, (C) Comprehension, (A) Application, (AN) Analysis or (N) None of these. Check one:

1. Combine two ideas into a new metaphor. ___ ___ ___ ___ ___
2. Disect the frog and illustrate what you find. ___ ___ ___ ___ ___
3. Classify soil samples based on ph values. ___ ___ ___ ___ ___
4. Convert inches and feet into meters, when given example problems ___ ___ ___ ___ ___
5. Paint a picture of the fruit in the bowl. ___ ___ ___ ___ ___
6. Discuss the feelings that Huck Finn had when his father locked him in the room. ___ ___ ___ ___ ___
7. Find the location of Slick, OK using a map. ___ ___ ___ ___ ___
8. Find the location of the capital of the U.S.A., Washington, D.C., using a U.S. Map. ___ ___ ___ ___ ___

The fifth level of the Taxonomy is Synthesis which refers to the ability to draw together ideas or materials from different sources and to put the parts together to form a new whole. This may involve the production of a unique communication (theme or speech) a plan of operations (research proposal) or set of abstract relations (scheme for classifying information). Learning outcomes in this area stress creative behaviors, with major emphasis on the formulation of new patterns or structures which are designed to be communicated to others.

Things that a student is likely to do at the Synthesis level include (1) Produces unique communications (Gubblz ergerg zug); (2) Formulates new hypotheses based on analyzed information (If I put one drop of super glue on the frontlip of each desk drawer . . .); (3) Makes discoveries and generalizations (It takes two hands to handle a whopper . . .); (4) Proposes new ways of doing things (You are going to put your what in his where?).

ANSWERS: 1-N, 2-AN, 3-AN, 4-A, 5-A, 6-C, 7-A, 8-K.
The highest level of the Taxonomy, Evaluation, is concerned with the ability to judge the value, quality, or correctness of material (statement, novel poem, research report) for a given purpose. The judgements are to be based on definite criteria. These may be internal (organization) or external criteria (relevant to the purpose) and the student may determine the criteria or be given them. Learning outcomes in this area are highest in the cognitive hierarchy because they contain elements of all of the other categories, plus conscious value judgements based on clearly defined criteria.

Here is another set of objectives to categorize.

<table>
<thead>
<tr>
<th></th>
<th>K</th>
<th>C</th>
<th>A</th>
<th>S</th>
<th>E</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Determine whether Rene Descarte was a better philosopher than he was a mathematician.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Describe your feelings about freedom.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Given a list of sentences, select the verb in each sentence.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Write the Spanish word for work.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>State the definition of entropy in your own words.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Teach the concept of Zebec to the class.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Inspect the school cafeteria and prescribe the vermin eradication measures that are necessary.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Given a list of stories, categorize them as fiction, biography, etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Build a model which represents love.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Remember, back at the beginning of this booklet we said that you would learn to have fun and to share the things you were interested in with others. OK, now that you know Bloom's Taxonomy here is a way that you can go about it.

Using Bloom's Taxonomy

Students with different levels of ability and interest will probably respond differentially when different levels of questions are presented. Gifted, bright and/or highly interested students, in a given content area, are more capable of processing and dealing with analysis, synthesis, and evaluation level questions than their less able or less interested counterparts.
Obviously all students should be expected to be able to answer basic objectives in any content area but the higher level students (in terms of ability and interest) should not be restricted to questions at this level. This is illustrated below:

<table>
<thead>
<tr>
<th>Gifted/Highly Interested</th>
<th>Average Ability/Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Knowledge</td>
</tr>
<tr>
<td>Comprehension</td>
<td>Comprehension</td>
</tr>
<tr>
<td>Application</td>
<td>Application</td>
</tr>
<tr>
<td>Analysis</td>
<td>Analysis</td>
</tr>
<tr>
<td>Synthesis</td>
<td>Synthesis</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Evaluation</td>
</tr>
</tbody>
</table>

It is generally assumed that the taxonomy is hierarchical, that is the student must be able to perform at the lower level prior to proceeding to higher levels. This is true for contents where the students do not possess any knowledge, but these contents are few and far between. In most cases you can assume that more able and more interested students will have more knowledge and experience with the content than other students and therefore you can expect these students to enter the content at initially higher levels.

To share your interests with others, you can create Bloom's units. In Appendix 1 of this booklet, you will find a list of different objectives at each level in the Taxonomy. In some cases the objectives are stated in question form, either approach being acceptable. Appendix 1 also provides a verb list which should facilitate writing objectives. Appendix 2 provides a list of products which can be used in the creating of Bloom's units. Students should always be asked to develop a product as a result of interacting with the material, however, as you will readily recognize, writing a paper is only one option.

Appendix three contains four example learning units which have been developed based on Bloom's Taxonomy. Units 1 & 2 are centers without content. This kind of center basically presents a series of questions or objectives based on the Taxonomy. The student is free to choose within the objective set which one or ones he/she will work with. Units 3 & 4 are centers developed around an article or book or series thereof. Unit 4, The Swamp Rabbit, has the article included as an example.
Developing Learning Centers

Remember not all students read or process information as well as you do. Toward this end the following are provided as suggestions for learning center development.

Prepare directions for the students (insure that the students can function independently using the center).

a. Make the directions clear and legible.
b. Use terminology familiar to students.
c. Use audio-visual aids to help students understand directions, if necessary.
d. Include enough organizational information to enable students to work independently.
e. Include examples of tasks to be accomplished, when appropriate.
f. Include the objectives and/or purpose of the center.
   1. Clearly state the objectives—help student be more purposeful, better organized, better able to determine when they have reached the objective. It is imperative that the students know what they are to do and under what conditions and standards, if conditions and standards are to be imposed.
   2. Tell the students that they may choose among the objectives offered this promotes individualization, interest, and motivation. They can do as many or as few as you will allow.

g. Include information about evaluation, the students should be able to correct their own answers for knowledge and comprehension levels.

Writing Bloom's Centers

The following give some brief ideas for formatting/packaging in Bloom's units you have created. You should remember that the more interesting and exciting the unit looks the more likely you are to entice others to explore what you have written.

1. Centers without content
   a. Determine what the content is to be — should be related to a content taught in your school.
   b. Determine the kinds of behaviors which you wish the students to have as alternatives at each level. (See verb list)
   c. Determine the kinds of products which the students should develop for each objective, products produced should be of a kind that are sharable with other students. (See product list)
   d. Determine if center is to be part of a larger center or if it is to stand alone. If yes, then format according to the format of the larger center.
   e. Identify creative formats for packaging center.
      1. Determine size
      2. In a folder? More creative format, e.g., in a small trash can, or shoe, etc.
      3. A folder with pockets?
      4. Reference card?
      5. Self-checking card for knowledge and comprehension? Red acetate pocket?
6. Bibliography? In a pocket?
7. Task cards? On a ring? Cut in different shapes?
8. Backboard?
9. Are pictures available to illustrate folder or backboard?
10. In a notebook with other centers?
11. Identifier tab, if designed for file drawer?
12. Insure that formats are self checking and self evaluating where possible.

f. Indicate whether or not a contract is necessary and the form that it should take, if it is required.

2. Centers developed around articles or other text content.
   a. Items A-F from number 1.
   b. Determine if the knowledge and comprehension items will be drawn from content beyond the text, e.g., define words using a dictionary.
   c. Determine format for knowledge and comprehension questions.
   d. Determine how many objectives at each level are appropriate for the amount of content.
   e. Look carefully at the relationship between text and picture so that both can be tied to questions or objectives.
   f. Determine how the article(s) will be bound
      1. Rubber tape
      2. Stapled
      3. Spiral bound
      4. Glue and edge
      5. With or without cover page
   g. Determine how article will be packaged once bound
      1. In folder
      2. In spiral or 3-ring notebook
      3. In pocket or backboard
   h. Determine packaging if article is one of several for the center.
   i. Determine how task cards or objectives however formatted will be related to the article(s).
   j. If the article has pictures, posters, maps, other graphics which you wish to emphasize:
      1. Examine graphic and isolate those things which would be focal stimuli for objectives.
      2. Read text (if any) for possible objective ideas.
      3. Determine if focal stimuli can be used for objectives at several levels.
      4. Write questions (objectives) about the entire graphic.
      5. Consider asking global questions about the graphic which are related but not necessarily drawn directly from it, e.g., a question about the perfectly acceptable to have the student do research which goes beyond the visual.
      6. Determine the kinds of knowledge and comprehension questions which can be asked. Determine if you can make these self-checking.
7. Look at creative ways of formulating the graphic
   a. Rolled and laminated
   b. On a fold up backboard
   c. On a window shade
   d. In a picture frame (multiple graphics in a poster display rack.)
   e. As a scroll
   f. On poster board
   g. On a slide (for a slide projector)

3. Decorating the Center.
   a. Magazine pictures on front and back or inside
   b. Drawings on front and back or inside
   c. Cut up wrapping paper
   d. Curiosity provoking statements
   e. Color contrasts
   f. Real photos
   g. Back-board
   h. Tasks (objectives) on cards cut to illustrate the center, e.g.,
      dinosaur shaped for dinosaur center.
Appendix 1

Knowledge

Example Questions/Objectives

Define
Define the term family.

Draw
Draw on the chalkboard, the reproductive organs of a flower.

Repeat
What did the book say about ________.

Record
Can you recall what the author said about?

Recall
Recall the Gettysburg Address.

Recognize
Which of these tools (hold up several) is a crescent wrench?

Write
List the bones in the leg.

Memorize list
What is the name of this object (hold up object)?

Name
Who invented the ________.

Relate
Choose between these two blocks, the one which is larger.

Choose
Find the location of Paris on the map at the front of the room.

Find
Can you arrange the parts of the skeleton in the correct order?

Arrange (in learned order)
Can you label the parts of the diagram?

Label
Select the verb in this sentence.

Select
Underline the noun in the sentence.

Underline
Can you quote what the book says on this matter?

Quote
Can you say the Spanish word for work?

Say
Can you identify the verb in this sentence? (give sentence)

Touch

Identify
Point out the location of your nose.

Hold
Point out

Check
Locate

Rehearse
Pickup

Affirm
Point

Associate
Enumerate

Copy
Point

Group
Microfiche Reproduced To order microfiche, contact ERIC Clearinghouse and Library Center

Indicate
Reproduce

Point out
Distinguish

Locate
Acquire

Can you distinguish between ______and______?
Example Questions/Objectives

What is the capital of Kentucky?
Name the major Indian tribes in Oklahoma in 1840.
What two types of reasoning are used in the study of mathematics?
What is the algebraic symbolization of the pythagorean theorem?
How many states are there in the United States?
How does a plant get water?
What are the three important rules to follow in using the comma?
What is the proper form for writing a friendly letter?
Who is the author of Make Way for Ducklings?
How do you determine the miles per gallon a car is getting?
What name is commonly given to the idea expressed by \( a + b = b + a \) in mathematics?
List the main characters and their roles in The Hobbit?
What is a synapse?
What is free verse?
What is an isotope?
What state grows the most lettuce?
How do you spell Mississippi?
What steps does one follow in directing a bill through congress?
To what classification does the silk moth belong?
What are the three criteria by which we can assess the quality of a television program?
What are the basic steps in organizing a term paper?

<table>
<thead>
<tr>
<th>Verbs</th>
<th>Example Questions/Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classify</td>
<td>Classify these plants into broad leaf or narrow leaf varieties.</td>
</tr>
<tr>
<td>Compare</td>
<td>Compare the books (listbooks) and tell why they are similar and different.</td>
</tr>
<tr>
<td>Contrast</td>
<td>Contrast the meter of the poems (supply poems).</td>
</tr>
<tr>
<td>Describe</td>
<td>Describe the reaction which you get when you mix vinegar and soda.</td>
</tr>
<tr>
<td>Discuss</td>
<td>Discuss the feelings that Huck Finn had when his father locked him in the room.</td>
</tr>
<tr>
<td>Interpret</td>
<td>Interpret the results of the experiment we just performed.</td>
</tr>
<tr>
<td>Translate</td>
<td>Translate this definition (give definition) into your own words.</td>
</tr>
<tr>
<td>Change</td>
<td>Reword this statement (supply statement) so that it is correct.</td>
</tr>
<tr>
<td>Reword</td>
<td></td>
</tr>
<tr>
<td>Revise</td>
<td></td>
</tr>
<tr>
<td>Qualify</td>
<td></td>
</tr>
</tbody>
</table>
Application

Example Questions/Objectives

Apply
Apply the formula to this problem and tell me the correct answer.

Calculate
Calculate the answer using the appropriate procedure.

Complete
Can you complete the statement?

Demonstrate
Demonstrate how you would skin a hog.

Illustrate
Illustrate the neural network which is presented on the slide.

Practice
Solve the following problems.

Solve
Use formal logic in developing your answer.

Use

Employ
Can you dramatize the interaction which took place between the two men?

Dramatize
Show me how to set the microscope.

Show
Operate the band saw, using appropriate safety techniques.

Operate

Exhibit
Manipulate the microscope controls to set the magnification at 100X.

Adopt

Try

Manipulate

Mobilize

Devote

Handle

Wield

Put to use

Exploit

Put in action

Exert

Consume

Take up

Capitalize

Construct (follow diagram)

Teach
Teach the concept of ____ to the class.

Paint
Paint a picture of the fruit in the bowl.

Sketch
Sketch a diagram of the muscles in the human hand.

Interview
Interview your team mate on the following topic (indicate topic).

Record

Simulate
Simulate the behavior of a _________.

Classify
Classify these fossils into groups based on skeletal type.

Analyze
Analyze the solution in the test to be and determine its chemical composition.

Classify
Classify the samples of soil, using a pH test, into acid, alkaline and neutral soils.

Discuss
What was the author's purpose, bias, or prejudice?
<table>
<thead>
<tr>
<th>Verbs</th>
<th>Example Questions/Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divide</td>
<td>What must you know for that to be true?</td>
</tr>
<tr>
<td>Explain</td>
<td>Infer which of the components is malfunctioning given the following input (give input).</td>
</tr>
<tr>
<td>Infer</td>
<td>Inspect the food processing facility and prescribe the vermin eradication measures necessary.</td>
</tr>
<tr>
<td>Inspect</td>
<td>Separate the main from the subsidiary characters in the book.</td>
</tr>
<tr>
<td>Separate</td>
<td>Sort these vegetables according to _________.</td>
</tr>
<tr>
<td>Sort</td>
<td>Which are facts and which are opinions?</td>
</tr>
<tr>
<td>Differentiate</td>
<td>Compare (list similarities and differences) the two characters in _________.</td>
</tr>
<tr>
<td>Experiment</td>
<td>Contrast (list differences) the two methods.</td>
</tr>
<tr>
<td>Compare</td>
<td>Investigate the relationship between plant growth and fertilizer application.</td>
</tr>
<tr>
<td>Contrast</td>
<td>Discover what is missing in this diagram.</td>
</tr>
<tr>
<td>Scrutinize</td>
<td>Can you detect the power shift using a ________ on this piece of equipment.</td>
</tr>
<tr>
<td>Probe</td>
<td>Examine this specimen and classify it based on its attributes.</td>
</tr>
<tr>
<td>Investigate</td>
<td>Dissect the frog and illustrate what you find.</td>
</tr>
<tr>
<td>Discover</td>
<td>Simplify this mathematical statement.</td>
</tr>
<tr>
<td>Inquire</td>
<td>Breakdown the solution into its component parts using a centrifuge.</td>
</tr>
<tr>
<td>Detect</td>
<td>Categorize the stories into fiction, biography, etc.</td>
</tr>
<tr>
<td>Examine</td>
<td>Diagnose the fault in _________.</td>
</tr>
<tr>
<td>Survey</td>
<td>Divide this expression into its component part...</td>
</tr>
<tr>
<td>Dissect</td>
<td>Isolate the critical incident in the chapter which changed the way the character viewed world.</td>
</tr>
</tbody>
</table>
Verbs

Measure

Example Questions/Objectives

Measure the impact of the statement on your classmates.
Are the author's conclusions substantiated by evidence?
How did Indian families, in Oklahoma, circa 1840, divide the daily work?
Which of the statements in the proof are not properly supported?
What is the theme that recurs throughout this musical arrangement?
Study the diagram and given information.
What is the theme that recurs throughout this musical arrangement?
Which of the statements in the proof are not properly supported?

Arrange (new way)

Combine these two ideas into a metaphor.

Construct

Construct a model which illustrates the way in which the process works.

Create

Create a story which illustrates your viewpoint or the subject.

Design

Design the alternative method to _____.

Develop

Develop an alternative way to doing _____.

Generalize

Generalize this concept (provide concept) to other situations.

Organize

Organize these ideas into a meaningful structure.

Plan

Present a plan to do _____.

Predict

Predict the outcome(s) based on the information which has been developed in _______.

"Some people are more equal than others."
Describe the process by which the individual who voiced this phrase arrived at his conclusion.

5pki
Prepare a new approach to ________.
Compose a (music, art, etc.) piece.
Propose a new method by which ________.
Produce a product.
Invent something which will ________.
Formulate a new procedure which will ________.
Assemble the data, in a new way.
Build a model which represents ________.

What would you do if ________?

Systematize the information according to your own internal representatives of ________.

Reorganize the information to support your viewpoint or argument.

Make a ________ to ________.

Generate a (poem, product, etc.) using the ________.

Compile a review of the literature on ________.

If no one else knew, how could you find out?

What recommendations would you make to improve the air pollution problem in large cities?
What would an Indian family (Oklahoma, circa 1840) need to do to move?
How would you plan to teach a unit on geometric construction?
What would the world be like if we had no unique mathematical operations?
What would be the most important questions to ask in determining a solution to this problem?
How could the story have ended differently?
How many different uses of the coat hanger, other than hanging clothes, can you name?
Can you devise a set of rules for the first group of settlers on the moon?
Based on our study of the development of the African counties, what predictions can you make about the political future of Tanzania?
Verbs

Appraise
Assess
Critique
Estimate
Evaluate
Grade
Judge
Rank
Recommend
Test
Decide
Compare
Revise
Conclude
Select
Criticize
Measure
Prioritize
Weight
Accept
Reject
Determine
Referee
Umpire
Arbitrate
Decree
Rule on
Award

How might the days or seasons differ if the earth was in the shape of a pyramid with a square base? Assume that the earth revolves on its own axis and rotates around the sun.

How can you best communicate your feelings about freedom?

How can we get community support for a peer drug counseling program?

From our experiments with plants and different types of soil, what statement can we formulate regarding plant growth?

Drawing on your experiences in school, how do people view education in this country?

Evaluation

Example Questions/Objectives

Appraise the value of ________.
Assess the viability of ________.
Critique the article, based on the teacher checklist.
Estimate the results of taking the course of action.
Evaluate the merits of ________.
Grade the level of quality of ________.
Judge, based on internal criteria, the worth of ________.
Rank the merits of ________.
Test, using the experimental method, the hypothesis of ________.
Which of the books would you consider of greatest value?
Conclude whether or not the hypothesis should be rejected.
Select the best ________ based on internal/external criteria.
Which policy will result in the greatest good for the greatest number?
For what reason would you favor ________?
Determine the merits of the arguments.
Verbs

Censure
Settle
Edit
Adjudge
Debate
Editorialize

Example Questions/Objectives

Based on the criteria of effectiveness and economy of time, effort, and money, what would be the best solution to the middle east conflict?
What are the good and bad aspects of being a member of a nomadic group?
Was Rene Descartes a better philosopher than a mathematician?
Is the construction of this geometric figure an accurate representation of the given information?
Which of the three pictures has the best color combination?
What conclusion can be justified in the selection read?
Is this the most appropriate art form to depict the subject?
What best justifies the action taken by the countries presently being studied?
Was this event accurately reported by the correspondent?
Indicate in what ways this is a beautiful poem?
According to the stated situation, which is the most appropriate move that man could take?
What do you think could happen if the Berlin Wall were torn down and the barriers were removed?
Appendix 2
Products

The following are illustrative of products which the students can be asked to develop. You should try always to have students develop some product as the result of doing a Bloom's objective.

1. a letter
2. a lesson
3. advertisement
4. annotated bibliography
5. art gallery
6. block picture story
7. collage
8. collection
9. collection w/illustration
10. chart
11. choral reading
12. comic strip
13. cooked concoction
14. crosscut diagram
15. crossword puzzle
16. debate
17. demonstration
18. detailed illustration
19. diorama
20. display
21. editorial
22. essay
23. experiment
24. fact file
25. fairy tale
26. family tree
27. filmstrip
28. flip book
29. game
30. glossary
31. graph
32. hidden picture
33. illustrated story
34. jigsaw puzzle
35. labeled diagram
36. large scale drawing
37. learning center
38. letter to the editor
39. map
40. map w/legend
41. mini-center
42. mobile
43. mural
44. museum exhibit
45. model
46. oral report
47. pamphlet
48. photo essay
49. pictures
50. pictures dictionary
51. picture story for children
52. poem
53. porta-center
54. poster
55. project cube
56. puppet
57. puppet show
58. rebus story
59. riddles
60. scavenger hunt
61. science fiction story
62. scrap
63. sculpture (clay, wire, junk)
64. seek and find
65. skit
66. small scale drawing
67. song
68. songs (collection)
69. stencil
70. story
71. street map
72. survey
73. tape
74. terrarium
75. text book
76. time line
77. transparency for an overhead projector
78. travelogue
79. TV news report
80. video tape
81. vocabulary list
82. worksheet
83. written report
Appendix 3
Units Without Content

These units were developed by Pat Jaynes (1982) as part of an introductory course in gifted education at Oklahoma State University.

Wild Birds in Our Area

Knowledge: Make a list of birds you already know. Study the field guides so you know how to use them. Use the maps to identify birds of this region and familiarize yourself with species you will find here.

Comprehension: Explain the maps. Discuss the localities different species live in.

Application: Take several field trips with an experienced birder or with a local Audubon Society member or group. Identify as many as you can. Keep a list of those you see and be able to describe the habitat group (lakes, ponds, city parks, salt marshes, etc.)

Analysis: Write an article for the school paper or the local Audubon Society's newsletter telling about your field trip.

Synthesis: Develop a plan for making an area attractive to birds. Make a bird house for a specific species (bluebird, martin, wood duck, wren). Put it up in the most appropriate, inviting place. Do planting for wild birds. Set-up a feeding station.

Evaluation: Decide whether or not persons in the local community should increase their efforts to attract and feed birds.

Current Humor in the U.S.A.

Knowledge: Make a list of political issues (gun control, taxation, defense spending are examples) and current values (marriage, ERA, child-rearing, working women, changing sex roles, TV are examples.)

Comprehension: Discuss in a written paper or a poster the pros and cons of five issues or values you have chosen (3 of each). Present both sides of the controversial topic.

Application: Collect cartoons, political cartoons from the editorial pages of newspapers or comic strips. Arrange them to illustrate the topics you have chosen. Make them into a cartoon book or make transparencies to share with others.

Analysis: Tell what you've found about the techniques the cartoonists use (sarcasm, irony, caricature, etc.). You might have to do additional research on elements of humor. Discuss in writing, or on tape, what you think makes certain cartoons funny to you, to others.

Synthesis: Do a series of cartoons of your own to illustrate two chosen topics. Make some that illustrate both sides of the argument. Submit your favorites to your school newspaper or your local paper.

Evaluation: Make a list of criteria for judging cartoons. Judge the ones you have. Support or dispute the stand taken by the cartoonist.
Appendix 4
Units with Content: Corals and The Swamp Rabbit

Knowledge and Comprehension Questions
Exploring Australia's Coral Jungle
Work Sheet
(Developed by Kay S. Bull, 1984)


1. What is a Bommie?

2. Define the following:
   a. Gorgoneion
   b. Mollusk
   c. Aquarists
   d. Hydroids

3. Identify the greatest geographic feature on the earth built by an animal.

4. Why does the reef system end in the south at Lady Elliot Island?

5. List five habitat requirements of coral.

6. List the dangerous poisonous animals that are in the article.

7. List 5 night feeders which live in the coral reef.

8. Why is the crown of thorns starfish called a spiked scourge?

9. What is the difference between a soft coral and a regular coral?

10. Explain why you could not make a 1:1000 scale model of the Great Barrier Reef.
Exploring Australia's Coral Jungle
Answer Sheet

1. A coral head

2. a. Representing the head of a gorgon, especially medusa; something that looks like this.
   b. in invertebrate in a shell which at least partially encloses a soft unsegmented body with gills, mantle and foot.
   c. People who keep aquaria or fish tanks
   d. that form of hydrozian which is asexual and grows into branching colonies by budding.

3. The Great Barrier Reef

4. Water temperature drops below 68 degrees F.

5. 68 degrees fahrenheit water, light, salinity, nutrient and oxygen content.


7. Stingrays, mollusks, crabs, starfish, coral

8. It eats coral

9. The soft coral does not have a limestone extoskeleton

10. Because at this scale the model would cover 800 square miles.
Exploring Australia's Coral
Higher Level Questions

(AN) What was the attitude of the author toward collectors of specimens? What makes you think so? Cite specific examples.

(AP) Make a chart showing the different shapes of coral. (Provide at least 10 examples.)

(E) Why would cleaner wrasse be able to change from female to male? Make a speech about the biological necessity of this behavior.

(S) Imagine that you were a crown of thorns starfish. You have been asked to defend your kind in a public forum, a nationally televised panel show, where newsmen will question you. To prepare for this you need to have practice dealing with possible questions. Prepare your briefing book.

(AN) Compare man to fish in terms of locomotion, habitat, diet, etc.

(AN) Why did the Great Barrier Reef develop? Where did it? Develop a slide show or film strip to support your analysis.

(AP) Construct a model of a coral reef.

(E) Julie Booth lived by herself on the coral reef. Examine the pro's and con's of such an existence. Write a propagandistic speech which is designed to either have people live by themselves or vice versa.

(S) Imagine that you were a 3 inch high aquaperson who lived on a coral reef. Describe your life in a poem.

(S) Look at the various kinds of coral. Draw a montage of the various corals to show how you feel when you are happy.
1. What has reduced the range of the swamp rabbit? ________________

2. Describe how a box trap works. ________________________________

3. Define the following:
   a. Leached ________________________________
   b. Splayed ________________________________
   c. Sedge ________________________________
   d. Bramble ________________________________

4. How would male swamp rabbits mark off their territory? __________

5. Why would a swamp rabbit build its nest on the high ground? ________

6. How large does a swamp rabbit grow to be? ________________

7. How do biologists make population counts of swamp rabbits? ________

8. How can you tell the difference between the track of the swamp rabbit
   and the track of a cottontail? ________________________________

9. How long is it, approximately, from the time a swamp rabbit is born until
   it is on its own? ________________________________

10. Why is the swamp rabbit formally named sylvilagus aquaticus? ________
Swamp Rabbit
Answer Sheet

1. Dams, agriculture, the Bulldozer, man

2. Rabbit enters the box, pulls at the bait and the door shuts.

3. a. To have soluble constituents removed by percolation
   b. To spread out, expanded or extended.
   c. Any of various rushlike or grasslike plants consisting of the cyperaceous genus.
   d. Any rough prickly shrub, as the dog rose.

4. Beating the ground with their hind feet, thus creating a rapid humming noise.

5. To keep it from being flooded.

6. Six pounds

7. Look for and count number of droppings.

8. The swamp rabbit track will be larger with slightly splayed toes and large toenails.

9. About 50 days.

10. Genus-sylvilagus; species - aquaticus or water
Swamp Rabbit
Higher Level Questions

(AP) Draw a map of the swamp rabbit habitat in Oklahoma, during the 1930's.

(S) Describe being harvested with a green stick as if you were a swamp rabbit. Write a song about it.

(AP) Build a box trap capable of trapping a six pound swamp rabbit.

(S) Write a play about swamp rabbits. You may use Watership Down as a model if desired.

(A) Analyse topographical and topological maps of your area. On a country map indicate the most likely swamp rabbit habitat.

(A) Draw a set of pictures showing the differences between swamp rabbits and cottontails. Create a display of pictures and text which could be used for an informative poster session.

(E) Evaluate the remaining range of the Oklahoma swamp rabbit. Project, based on current economic predictions, the range of the swamp rabbit in 2025 A.D.
Sacrifice to Progress

SWAMP RABBITS once occupied a range in Oklahoma that reached from the fertile valleys along the Washita River in the west to the Arkansas state boundary in the east.

Erratic routes that free-flowing rivers took across the state created vast acres of prime swamp rabbit range. The behavior of these rivers could not be tolerated by some men. Means of taming them began.

In this modern civilization, man's capacity for making rapid changes in the environment is evident everywhere. Construction of dams make mild, slow-moving streams out of once free-running rivers. Fertile soils that had built up in overflow areas were reclaimed for agriculture, thus bringing about extensive changes in land use that took its toll of wildlife...especially swamp rabbits.

Here was an animal that could cope with its unrelenting natural predators and the seasonal pressure of beagles and hunters. Still, it was no match for the bulldozer. Bramble patches, sedge fields and cane breaks gave way to soybean fields and improved pastures.

This story involves a species of wildlife that is directly in the path of progress. Man's constant desire to change has started the extinction process that undoubtedly will spell the demise of one of the finest game animals ever to perplex a hunter in Oklahoma.

Back when the depression of the 1930's hovered over the state, the then-plentiful swamper played an important role. Pursuit of this rabbit by hunters became an enjoyable and inexpensive pastime. There were several methods of capture employed back then.

One involved the use of a fast "cur" dog and a forked green stick. The fast dog, most often a silent trailer, surprised the rabbit and forced him to seek the safety of the nearest burrow. Once located, the rabbit could be pulled out by means of the forked stick twisted in his fur.

Sometimes the swamp rabbit took refuge in a hollow log, and the more zealous (or famished) of his human pursuers would use a cross-cut saw to sufficiently shorten his wooden refuge. A green hickory stick made a good probe to locate the rabbit so the hunter didn't saw him in half

A young swamp rabbit emerges from his nest to start a perilous journey through life. His kind can successfully cope with hunting pressure and predators, but not with the habitat-destroying drainage ditch and bulldozer.
or cut the deadwood too far away from him.

The method that probably resulted in the harvest of more swamp rabbits than any other during the lean years was a simply constructed box trap. Baited with a food attractive to the swamper, the box trap was often placed in rabbit runs and feeding areas during the winter.

At one time, Oklahoma provided a wide variety of swamp rabbit range across its forested landscape. The range extended from the cottonwood-dominated Washita River bottoms south and eastward to the giant cypress swamps along the Mountain Fork.

The Kiamichi Mountain area in the southeast provided only limited range for the swamper, even back during the animal's prosperous years. The bottomland soils were leached poorly drained and relatively infertile. These lands were cleared and cultivated for a short period of time, then allowed to return to hardwood cover.

A large wooded section of rolling uplands extending from the Kansas state line to Texas produced prime swamper habitat along its streams. Fertile soils created havens for this animal on the north side of the winding river valleys.

A smaller range occurred in south-central Oklahoma where irregular areas of lowland hardwood afforded swamp rabbit environment. A low population of these rabbits still occupies the southern part of this range.

A network of rivers that drained the northeast created another fine area for swampers. Most of the runoff moved to the Arkansas River where wide valleys of hardwoods became the predominant vegetation. Early inhabitants found ready uses for this excellent timber, and the resulting cut-over lands further proliferated the rabbit.

The last stronghold of the swamper in Oklahoma was the coastal plain drained by the Red River. An abundance of marsh type plants were produced by the heavy clay soils, mild climate and annual rainfall of approximately 55 inches.

The swamper's range in central Oklahoma was limited to the narrow woody streams that carried rainfall from the prairie.

In his element, the swamp rabbit is like all of Nature's creatures ... a unique wonder to behold. He has his own peculiarities and standards, not the least of which is the territorial and courtship behavior.

In Spring, when the length of day increases, strange lyrics begin to ride the sound waves in swamper country. Males usually announce their ownership of territory by beating the ground with their hind feet, thus creating a rapid thumping noise.

The same stimulus that prods the male lures the female to new activities. She will join the male in making feinting dashes, high jumping and "facing off", all the while emitting a high-pitched squeaking noise.

This activity may start as early as January, although the reproduction pattern of swamp rabbits in Oklahoma does not generally conform to patterns studied in more northern ranges. In some populations in our state, reproduction has occurred throughout the year.
This does not guarantee a good population, however. When a rapid, violent change in habitat occurs, the swamper population is thrown into a prolonged stressed condition, and entire litters may be lost before they are even born.

Most studies on this mammal have revealed very few nests, but those discovered have had similar locations. Nests are constructed on railroad fills, stump mounds and naturally elevated ground. Sites probably are selected to avoid flood waters that frequently invaded the range.

The nest is usually a mound of vegetation built above ground and approximately 12 to 15 inches long. There is often a slight depression in the middle. Nest material consists of surrounding vegetation, commonly broomsedge, and the depression is lined with fur pulled from the rabbit's throat and stomach.

It is too bad that the swamper requires a habitat associated with untamed rivers, areas where the stream channel shifts and large pools of shallow water are left after each heavy rain.
As farming and ranching developed into an intensified agricultural practice, demand became heavy for the marginal lands along the capricious rivers and creeks. It is in these lands and their borders that much of our upland game, not just the swamp rabbit, is produced.

When marginal land is brought into domestic crop production, the land values and tax structures seldom allow the area to revert back to its original state.

One of these agricultural practices now being applied to our decreasing swamper range is the construction of drainage ditches. These get rid of trapped surface waters that do not drain well through the heavy clays. Once the water is controlled, timbered areas are cleared and tame pastures take over.

Out of these and other endeavors to modify the natural drainage in this country for man's food and population needs, we are surely losing one of our most unique upland game species. The swamper is the sacrifice in his own particular area.

He will most certainly be missed . . . by the grizzled hounds that he led in merry circles through the scent-covering shallows . . . by the young fellow with his first shotgun who stares in disbelief at the "giant cottontail" swimming across a channel with all the skill of a raccoon or mink.

We still have a few isolated pockets of swamp rabbits in Oklahoma, and anyone who follows the beagles is doing himself an injustice by not trying for them, just once. Hunting pressure isn't going to hurt the swamper. It's the bulldozer, drainage ditch and dam that will eventually exterminate the species.

When one becomes closely associated with a creature of interest over an extended period of time, its destiny has a great significance. The route which the swamp rabbit has been forced to take disturbs our wildlife biologists.

The encroachment of modern agricultural practices on the habitat has reached a dangerous plateau. The swamper's existence hangs in the balance.

The alarm has been sounded, but will the echo be heard?
OUR MOST FAMILIAR RABBIT, The cottontail, has a close relative we don't know quite as much about. It's the swamp rabbit (Sylvilagus aquaticus), a rodent that inhabits lowland swamps and riverbottoms from east Texas and southern Oklahoma to Georgia. In Oklahoma, swamp rabbits are most likely to be found in southeast McCurtain County and swampy areas along the Arkansas River.

The swamp rabbit is not too difficult to distinguish from the cottontail if you give it a second look. It's larger (up to six pounds), has larger ears and darker, shorter fur. The tail is white underneath, but it is slender and very different from the round puff of white that gives the cottontail its name.

Another major difference between the two species is habitat preference. Don't look for the swamper in shrubbery second growth, old fields or suburban backyards, the favorite haunts of our upland-oriented cottontail. The swamp rabbit is more likely to be found in mature woods, especially in swampy areas where patches of water are interspersed with ridges of higher ground. However, cottontails may be found in such areas as well.

One good way to tell if you are in swamp rabbit territory is to look for the droppings they characteristically leave on top of stumps, logs or other elevated spots. This habit is so predictable with swamperers that some biologists have used the number of such sites in an area to help make population estimates. Studies indicate one individual may use several specific stumps, logs, or other elevated sites regularly.

THE TRACK OF THE SWAMPER is large, and the imprint of the slightly splayed toes and large toenails are distinctive. Also, the swamp rabbit often chooses to walk rather than hop. This is almost unique among rabbits and leaves an unmistakable trail, especially notable in mud or snow.

Like all rabbits, the swamper is a vegetarian. It eats herbaceous plants, especially sedge grasses, but less grass than the cottontail. In winter the diet consists primarily of bark, twigs and the seedlings or roots of perennial herbs.

Swamp rabbits are not often found far from water, a certain indication of how their common name was derived. They are willing swimmers. Water is a favorite refuge from pursuing enemies, and may also be used to dampen the effects of the oppressive summer heat.

The swamp rabbit may use a stream for backtracking, or it may try to escape a pursuing dog by diving. Sometimes a harried swamper is discovered hiding under an overhanging bank, submerged except for eyes and nose. This bunny seems to have no eversion to getting wet, even in the coldest weather. A casual swim to a small island merely for a look around is not unusual, though it may bring a "double-take" from any person seeing it.

Swamp rabbits are much like cottontails in their behavior, except that they are more vocal. Five different calls can be heard. Either sex may "squeak" at the other. A female who is being followed persistently by a romantic male may "chirp" softly.

The "alert call" is a loud, throasy, two-syllable sound which gets the attention of every other rabbit in the vicinity. The rabbit giving it stands on his hind legs, and all rabbits hearing it pass it along in the same manner. A loud "scream" is reserved for times of utmost distress, such as when the rabbit has been grabbed by a predator. This is a sound most often reproduced by commercial predator calls for attracting foxes, bobcats and coyotes.

MATING IS PRECEDED by lively courtship behavior involving mad dashes and dispersal of scent, accompanied by assorted leaps by both doe and buck. Fights between bucks occur at this time, but usually results in little more than the loss of some fur.

Mating activity is highest in February and March, though it may continue until September. Some of the rabbits that breed late may be young does born early the same season. The young are born about 40 days after mating, usually two to four in a litter and already covered with hair. During this time, males start courting her again. After about forty-five minutes in the nest giving birth, she may mate again immediately and, if this is the case, will probably have another litter in early summer.

The female spends two or three days building her nest. During this time, males start courting her again. After about forty-five minutes in the nest giving birth, she may mate again immediately and, if this is the case, will probably have another litter in early summer.