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ABSTRACT

The academic needs of gifted students are qualitatively different from those of regular students. This document describes a course that is differentiated for gifted students in the areas of content, process, learning environment, and product. Emphasis is placed on higher order thinking skills through independent study dealing with real world problems that add scope, depth, and acceleration to the course. The teacher-designed and student-designed activities described are tied to curriculum objectives and various thinking and learning models. They allow for individualizing the curriculum and self-paced learning in the student's preferred learning style. (Author)

# Maximizing Your Classroom Time for Authentic Science
(Differentiating Science Curriculum
for the Gifted)

## NATIONAL SCIENCE TEACHERS ASSOCIATION

Global Summit on Science
and Science Teaching

San Francisco, December 27, 1996



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## Abstract

The academic needs of gifted students are qualitatively different from those of regular students. The course to be described is differentiated for gifted students in the areas of content, process, learning environment, and product. Emphasis is placed on higher order thinking skills through independent study dealing with real world problems and issues. These projects add scope, depth, and acceleration to the course. Time is made available for these independent projects by compacting the regular curriculum.

Teacher-designed and student-designed activities are tied to curriculum objectives and various thinking and learning models (for example Bloom's Taxonomy of Educational Objectives). They allow for individualizing the curriculum and self-paced learning in the student's preferred learning style.

Products and intended audience for each activity are agreed upon in advance, and the student must submit his/her own evaluation of each product when it is turned in.

The logistics of putting together such a course must not be a burden to the teacher, and needn't be. Conceptual resources for product ideas are readily available to the resourceful teacher.



## Acknowledgement

The course described herein was developed while I was enrolled in a graduate course on writing curriculum for the gifted, taught by Dr. Diane Montgomery at Oklahoma State University.

# CLASSROOM LOGISTICS

## Procedures

This course has been designed specifically for students with advanced skills and interests. Emphasis is put on independent projects dealing with real world problems and issues.

Each testing unit begins with a one or two day overview of the new material. Along with this compacted presentation, students answer review questions from the relevant textbook chapter(s) as homework. Worksheets and repetitive example problems are provided for test preparation, but not for a grade. A pretest, which requires application of the new material, and higher order thinking skills (not just memorization), determines student mastery of the new concepts. Students who achieve a score of 80% or better may then design or choose an independent project to complete. These projects add scope, depth, and acceleration to an otherwise regular curriculum.

Choices are available from a list of teacher-provided possible activities, each worth a given number of points depending on the amount of new learning and complexity involved. The points are earned for all projects evaluated to be satisfactory, according to written criteria. Students are encouraged to design projects, with teacher concurrence, which take advantage of the individual student's particular talents and interests.

Students who don't achieve a score of 80% on the pretest participate in a reteaching-relearning activity lasting from one to several days. Then these students also go on to independent activities. This being a science course, relevant labs a scheduled as appropriate. They are for experience, and are not graded.

A posttest is given on the last day devoted to the unit. Students who lack an 80% or better on the pretest are required to take the posttest, and earn the higher of the two grades. Others have the option to take the posttest to raise their grade.

## Independent Projects

Independent projects represent evidence to the teacher of new learning (comprehension of concepts, newly acquired skills, planning the product, concern for the needs of the intended audience, etc.) by the student. Each activity is tied to a curriculum objective., whether basic or accelerated. Each takes the student beyond what is covered in the regular course. They provide a means of individualizing the curriculum, of meeting each student where he or she is, and allowing for cognitive growth which is self-paced, gained in the student's preferred learning style, and applied in areas of student interest.

By requiring a specific product and intended audience, the student must consider not only the knowledge aspect of their topic, but also its most desirable form and its impact on and use by different groups. Products cannot be summaries of research, they must be transformations from it. Products which don't involve research will require focused creativity and/or higher level thinking, such as: logical analysis of real-world problems; solving practical, open-ended problems; creating solutions to problems of society which are related to the discipline under study; establishing criteria, and conducting evaluations of potential problem solutions and of the student's own work. Students are required to complete at least one design-it-yourself project per year, as well as at least one biography per year (but no more than three).

## Student Conducted Evaluations

Almost all independent projects must be accompanied by the student's evaluation of his or her product. This practice provides additional use of higher order thinking skills as well as encouraging both objectivity and planning. The student is required to evaluate according to teacher-provided general criteria (which apply to any type of project), and student-defined specific criteria (which apply specifically to a poster, a poem, a biography, an invention, etc., on the student's topic). These evaluations are never graded, but the teacher's constructive comments are always added there. Students are required to write criteria before beginning the project.

The product is considered satisfactory, and earns the available points, if the weighted average of the teacher and student evaluations equals at least 4 on a scale of 1 to 5. Deficient products are returned to the student for improvement.

The student's share of the weighted average evaluation is intended to increase each nine weeks by a given percentage, from 80/20 to 60/40 (teacher/student). However this will be adjusted according to specific student progress in writing criteria and evaluating objectively.

Only one activity per week is accepted per student, avoiding the concentration of projects at the end of the grading period.

## Grading

Pre and posttests are collectively worth 50% of the grade, before considering nine week test results. The number of points possible per test equals the number of objectives tested times ten points each. Independent projects are also worth 50% of the grade. Each will earn a certain number of points toward the required number per nine weeks. Most activities range in value from 8 to 22 points, with 70 points required each nine weeks. An additional 10 points per semester are to be earned by keeping the required Summary Activity Form, class notes, graded tests, and completed projects in a notebook. The notebook becomes, in one respect, an alternative assessment portfolio.

After the required points are earned, additional independent project points count toward any deficiency of percentage points on chapter tests. If all chapter tests are raised to 100%, extra points are carried over from the first and third nine weeks, and used to earn a chapter test average in excess of 100% at the end of the second and fourth nine weeks. This is intended to provide incentive to the student to continue independent work after the required points are earned.

**Edmond Memorial High School**
**Honors Physical Science**
**Course Objectives**

**Unit 1:**

**In order to demonstrate an understanding of the processes and techniques involved in using the SCIENTIFIC METHOD OF PROBLEM SOLVING, the student will:**

a. problem solving
   1. demonstrate familiarity with basic terms associated with science and the scientific method (hypothesis, theory, law, experiment, chemistry, physics, variable, independent variable, dependent variable, experimental setup, control setup, observation, inference)
   (2). identify the steps of the idealized scientific method in a hypothetical problem solution

b. measurements
   1. demonstrate an understanding of the basic units and prefixes of the International System of Units (SI, or metric)
   2. solve problems using metric conversion
   (3). define the basic units (length, volume, mass) of SI measurement according to common, standard equivalents
   (4). predict (within 50% error) the metric measure (length, volume, mass) of objects provided

c. science and math skills
   1. correctly solve problems involving:
      (a) significant figures
      (b) scientific notation
      (c) dimensional analysis
   2. demonstrate the ability to display data by constructing and labeling a graph from tabular data
   3. name the basic scientific laboratory equipment
   4. demonstrate the proper use of laboratory measurement tools
   5. demonstrate proper laboratory technique for given procedures
   6. consistently follow proper laboratory safety rules and procedures
   7. establish a classification system and use observable properties to classify a group of at least ten related things
   8. Classify matter into a given four-category system
   9. distinguish between an element symbol, a chemical formula, and a chemical equation

d. properties of matter
   1. distinguish between chemical properties and physical properties
   2. distinguish between chemical changes and physical changes
   3. demonstrate an understanding of phase changes
   (4). relate the properties of a substance to its use
   5. solve three-variable problems involving density, using the four-step method

1. - required objective
(1). - expansion objective for honors class

# LEARNING MODELS

## Bloom's Taxonomy of Cognitive Educational Objectives

INCREASING COMPLEXITY ↓

| COGNITIVE LEVEL | STUDENT EXPECTED TO... | SAMPLE ACTIVITY: |
|---|---|---|
| KNOWLEDGE | learn specific facts, vocabulary, ideas, and reiterate them in similar form. | List in order the presidents who have held office since F.D.R. |
| COMPREHENSION | communicate knowledge and interpret previous learning | Using class notes, make a chart of the U.S. presidents since F.D.R. and list the major accomplishments of each. |
| APPLICATION | use learned knowledge, rules, ideas, methods in new situations | Choose any U.S. president and explain how he exercised his power as Commander in Chief of the Armed Forces. |
| ANALYSIS | take apart or break down a thing or idea into its parts and perceive the interrelationship | Design a diagram (original) to show the various responsibilities of the U.S. presidency. |
| SYNTHESIS | use elements or ideas in new and original patterns and relationships | You are working for a major political party in the U.S. The year is 2000. You are asked to "create" a presidential candidate. Describe how you do it. |
| EVALUATION | make decisions or judgments based on chosen criteria or standards | List characteristics you feel a good president should have. Using these criteria, choose the president you feel was the greatest American president. |

## Williams' Teaching Strategies for Thinking and Feeling
## Dimension 3 - Pupil Behaviors
## Four Aspects of Creative Thinking

***FLUENCY:** the ability to produce many ideas/responses

You have just finished the book The Slave Dancer by Paula Fox. There were many problems aboard the slave ship. List as many reasons as you can think of to explain why people living close together might not get along.

***ORIGINALITY:** the ability to produce unique, unusual responses

These felt scraps were left from the puppets we made. Think of, and be ready to show, something ORIGINAL for which we could use them.

first think of many ideas

try for ideas nobody else would think of

choose the one you think is most unusual and try it

***FLEXIBILITY:** the ability to produce many different categories of responses

A pencil can be used for writing things like labels, stories, autographs. It could also be used for holding things like holding up a window, staking a plant, etc.

How many other types of uses can you think of?

***ELABORATION:** the ability to embellish upon an idea

You have learned a lot about cities in the U.S. before 1900. Pretend you are a boy or girl in a large city (your choice) in 1890. Describe a whole day in your diary. How many details can you add?

Treffinger's Self-Directed Learning Model

Provides structure needed to gradually develop in students the skills necessary to become self-directed learners, and for moving both teacher and student toward a setting in which self-directed learning can occur. Emphasizes development of products and investigations in areas of student interest.

There are four instructional areas:

1. Identifying goals and objectives
2. Assessing entering behavior
3. Implementing instruction
4. Evaluating performance

There are four levels of movement:

1. Teacher-Directed - Teacher prescribes for class or for individuals.
   - Identify student interest areas
   - Create flexible classroom setting
   - Help students learn to deal with freedom of movement
   - Help students learn to manage their own time
   - Students learn to follow tasks through to completion
   - Students learn to maintain and use simple work records
   - Students learn how specific criteria can be used in evaluation
2. Student Involvement - Teacher creates options from which students choose.
   - Assist students in selecting and implementing activities
   - Identify specific student strengths and needs (skills)
   - Help students form pairs or small groups for skill work
   - Arrange room to facilitate pair and small group activity
3. Student-Developed - Teacher involves students in creating options.
   - Individual, small group, and large group meetings for:
     - Determination of topic areas
     - Planning projects
     - Developing evaluation criteria
4. Student-Directed - Student is in control of creating and choosing options; teacher provides resources and advice.
   - Assist students in planning and conducting independent projects.
   - Application of research and inquiry skills
   - Independent utilization of creative problem-solving techniques
   - Assistance in locating and using resources
   - Facilitating access to resources
   - Guiding students in locating appropriate audiences or outlets for products

Examples of Independent Projects

Unit 1 Projects

Chapter 1 (The scientific method and skills used in science):

1. Any idea that you may have for a project that will help develop your interest in a particular area of science, or combine science with your area of interest (art, literature, music, sports, history, etc.) can be discussed and transformed into an independent study project. It will require a designated audience and product. (points to be agreed on)

8. Conduct an experiment using six cans with open tops and various size holes in the bottom. Find a mathematical relationship between the sizes of the holes and the rate of emptying of the can. Write your results in the form of a standard scientific lab report. See your teacher for the cans, or get approval for your own setup. (18 points)

11. Create a sales tool (trifold, poster, song, poem, etc.) for use in explaining the advantages of the System International (metric measurement), and which will serve as a marketing tool to the general public, or a specific audience of your choice. (20 points)

14. As an amateur historian, you've decided to write an article for *American Heritage* magazine concerning the history of the use of, and laws concerning the use of, the metric system in the United States. (18 points)

15. Should the U.S. Congress pass a law requiring that all quantities of commercial products, public records, and legal requirements (such as speed limits) be expressed in metric units? Discuss the pros and cons and give your evaluation, along with the criteria you used to make your decision. Write your product as a letter to be published in Newsweek magazine. (16 points)

Chapter 2 (Properties of matter):

23. Imagine that you are an alien from another solar system. You've never before been to earth. Your assignment on this exploratory mission is to make observations about earth, for review by your superior, back home. The first thing you notice on this new planet is something, you learn later, which earth people call a tree. It is totally new to you. Your language has no words for tree, branch, or leaf. Describe this thing for your supervisor. (8 points)

25. You are a research chemist for a large manufacturing corporation. You have just discovered a new substance (which you will actually make in the lab, see your teacher for the "formula"). It's not the substance you intended to invent, but your boss doesn't want your efforts wasted ("Post-It" notes came from a failed attempt to invent a new glue). She wants you to (1) describe the properties of the new substance as completely as possible so that other chemists can also brainstorm, and (2) write your recommendation for possible uses for this substance. Your product will be a report to your boss. (18 points)

Chapter 3 (Classification of matter):

30. You are a financial consultant working for an independent oil refinery and are responsible for attracting investors into the business. Seeking to create an effective communication and sales tool, you have decided to write a report to potential investors describing the physical process of separation of different components of crude oil at the refinery. The report will include a description of the uses of various of these components (gases, gasoline, oils and solid hydrocarbons). (20 points)

Unit 2 Projects

Chapter 4 (Atoms and elements):

3. As a staff writer for *Discover* magazine, you have been assigned to describe the work of the alchemists, especially noting their contributions to modern chemistry. Describe the goals, as well as the techniques and procedures of the alchemists. During what period of time were they active? Who are some of the most famous alchemists? You will also make an evaluation as to whether the alchemists were really scientists. (20 points)

5. In 1987 Congress made Yucca Mountain, Nevada, the primary potential nuclear waste site in the U.S. Yucca Mountain is a ridge of welded volcanic ash called tuff. It is located about 100 miles northwest of Las Vegas. As a consultant to the government on radioactive waste, you are aware of the articles "Radioactive Waste Disposal", and "Nuclear Waste: Twentieth Century Pandora's Box". You know that many people support nuclear power in principle, but don't want any of its effects close to them. Your job is to meet with the leadership of the State of Nevada, and the people of the Yucca Mountain area and attempt to sell them on the idea of safe nuclear waste storage at their location. Your product will be your written speech to be given to this group. Include any necessary illustrations in with your speech. (22 points)

Chapter 5 (The periodic table):

11. You are a landscape architect planning a yard for a client. Look up the fertilizer requirements for five different kinds of plants (your teacher has information available for this). Look at the price and percent composition of several commercial brands of fertilizer. Calculate which ones would be the most economical for specific plant types. Your results should be in the form of a report to your clients. (16 points)

15. Take on the role of the famous 20th century scientist, Glenn T. Seaborg. Write an autobiographical account of his contributions toward the discovery of many of the actinide elements (the transuranium elements). Explain any implications of this work to national defense, and the development of the periodic table. Be sure to include answers to at least three of the questions covered by "Requirements of Biographies". (16 points)

Chapter 7 (Compounds and bonding):

17. Some people feel that the problems of food additives can be avoided by eating only "natural" or "organic" foods. What do these two terms mean? Do they mean the same

thing? What arguments are there for and against the exclusive use of natural or organic foods? Your answers can be in the form of a letter (by you, an expert in natural and organic foods) to the local newspaper for publication in their regular column, "Your Health". (12 points)

19. You are a physical science teacher. Read the article, "The bond of life". Write a test suitable for a tenth grade honors physical science class based on the article. The test must consist of five questions which require higher order thinking skills (levels three to six on Bloom's Taxonomy). Use no questions which require only the memorization of facts. In parenthesis after each question, indicate the level of Bloom's Taxonomy of the question, and your idea of a suitable answer to the question. (20 points)

Unit 3 Projects

Chapter 8 (Chemical reactions):

7. One of the seven base units of the SI system of measurement is the mole, a measure of the amount of substance, in mass or number of particles. It's used like a dozen, except that instead of 12, the amount is $6.02 \times 10^{23}$. Atoms and molecules are very small, so a large number of particles is still a small amount of substance. A mole of iron can be held in one's hand. How big a number is $6.02 \times 10^{23}$? See your teacher to be assigned a particular type of object. Find the volume of one of these objects and then calculate the volume of a mole of them. Show all of your calculations in an organized way on your product and compare the volume with the volumes on the list below. Which volume on the list is your calculated volume closest to? There's no need to do a self-evaluation for this project, although relevant criteria still apply. (16 points)

| Object | Volume |
|---|---|
| An average house | 850 $m^2$ |
| A mountain 9000 ft high and covering 36 $mi^2$ | 10,000 $km^3$ |
| The Atlantic Ocean | $4.75 \times 10^8$ $km^3$ |
| The moon | $2.2 \times 10^{10}$ $km^3$ |
| The earth | $2.6 \times 10^{11}$ $km^3$ |
| The sun | $3.38 \times 10^{17}$ $km^3$ |

8. You are an investigative reporter specializing in environmental issues. Research and write a newspaper article concerning the following topic: the amount of salt a large northern city, like Chicago, uses on its streets in a typical winter. What environmental problems result from this use of salt? What substitutes are being used for salt to melt ice and snow? (18 points)

## General Evaluation Criteria for Products

I. For all products:
   A. Content
      1. Evidence of understanding concepts and skills
      2. Elaboration
      3. Effectiveness
      4. Originality
      5. Includes student-conducted evaluation with specific criteria
   B. Presentation
      1. Creativity
      2. Overall appearance and neatness
      3. Point of view is from your highest level of maturity

II. For written products:
   A. Content
      1. Includes a bibliogrraphy for all research
      2. Includes answers to required questions for all biographies
   B. Presentation
      1. Clarity of writing
      2. Grammar, punctuation, spelling
      3. Follows proper format if reporting the results of a scientific investigation
      4. Illustrations are referred to in the text

III. For tangible products (models, inventions, etc.)
   A. Design
   B. Workmanship
   C. Adequacy of materials used

Explanation of General Evaluation Criteria

I.A. Evidence of understanding concepts and skills - (a) all statements and conclusions are accurate, (b) there are no contradictions within the product, and (c) all relevant skills are used at a reasonable level of competence

Elaboration - build onto or embellish a basic idea by adding detail to make it more interesting or complete; for written products, include enough background information to put the work in context for the reader

Effectiveness - the product produces the desired effect in the audience, whether it is to inform, persuade, entertain, etc.

Originality - the product is solely the student's effort, although he or she may have help in learning skills required to create the product

Includes student-conducted evaluation - the student will provide his or her own specific criteria (specific to this particular project) and evaluation of the final product results; each individual criteria will be evaluated on a scale of 1 to 5, and the overall product will be evaluated on the same scale; comments on individual criteria , or the entire product, or any other relevant comments are optional

B. Creativity - novel, unusual product created by use of an imaginative approach; indicates the creator's active involvement with the project

Overall appearance and neatness - should appeal to an audience based on pleasant appearance; no irregularities; orderly, clean, organized appearance

Mature point of view - perspective used in creating the product is your highest level of maturity

II.A. Includes a bibliography for all research - any references used are to be listed alphbeticlly using the reference system provided with the course resource materials, or that is acceptable to your English teacher; any product which is primarily a research product will have a minimum of three references, no more than two of which can be an encyclopedia

Includes answers to required questions for biographies - any biography must have attached to it answers to three of the five questions which indicate what benefits you have gained from researching the person's life

B. Clarity of writing - the product can be understood by the intended audience; ideas progress logically through the report

Grammar, punctuation, and spelling - the same care is taken as if this work is to be handed in to your English teacher

Follows proper format for reporting the results of a scientific investigation - format is shown below; report should be detailed enough that anyone else could read your report and exactly duplicate your experiment; an example report is in with the course resource materials

1. Introduction - including the context of the experiment and a statement of the problem

2. Methods and materials - a precise description of the materials you used (brand names, sizes, any changes to standard equipment, etc.) as well as the procedures, in sequence, that you used
3. Results - including the appropriate presentation of experimental data such as
    (a). data table
    (b). graph
    (c). diagram
4. Conclusions - what did you learn or accomplish with your study

Illustrations are referred to in the text - illustrations, graphs, pictures, and charts are not added as an afterthought, but are part of the product by being numbered and referred to in the text; examples: "See Figure 2.", or "Figure 4 shows this relationship in graphical form.".

III.A. Design - the concept behind the product is adequate to allow the device to perform its intended task on a repeated basis; the design is effective

B. Workmanship - the general appearance indicates that applied skill and care have gone into the creation of the product

C. Adequacy of materials used - the choice of materials, even if creative, should result in an effective, workable, useful product

## Specific Criteria

Criteria written by the student which indicate specifically the characteristics of a good product of that type(poster, trifold, report, etc.) and for the particular purpose in mind (education, persuasion, etc.).

For example, specific criteria for a biography might be:

Content:

- Maintains a balance between personal and professional life
- Discusses incidents in early life which helped mold personality/character
- Provides significant milestones in the person's life; birth, death, marriage, children, positions, awards, etc.
- Explains, in appropriate technical terms, the specific contributions made by the person
- Includes responses to at least three of the "Requirements of Biographies" questions

Presentation:

- Written in the required autobiographical form
- Includes a picture of the person
- Includes a diagram explaining the science related to the person's main accomplishment
- Typed in two-column form appropriate to a biographical encyclopedia

## Requirements of Biographies

Biographies must be written in the first person (as an autobiography). Strive to keep a balance between personal and professional information.

In addition to the above, your product must include a separate section in which you answer at least three of following questions using complete thoughts.

* What were (are) the personal traits which contributed most to this person's success, and what is the evidence for this?

* What have you learned from the life of this person that will help you in living your life? Explain your answer.

* What question would you like most to ask this person, and why?

* What one incident in the person's life would you like to have shared with this person, and why?

* What would you most like to tell this person, if it were possible, and why?

Responses to these questions require more than one or two sentence answers. Think about them as you research your person.

## Independent Project Self-Evaluation

Name_____ Date Submitted_____
Project_____ Number of points_____

Individual Criteria Evaluation
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Your Specific Criteria:
Content:

Presentation:

Teacher's General Criteria (those that apply):
Content:

Presentation:

Comments (optional):

Overall Evaluation (1 to 5):

Instructions for Completing Self-Evaluation Form

The proper time to set standards for your product is before you begin work on it.

I. List the appropriate general criteria for your product (by content and presentation) from the outline you received from your teacher. Some may not apply.

List your specific criteria for evaluation of the product (by content and presentation). These criteria should set standards for those qualities which are unique (specific) to your type of product. For example, for a poster: "The poster should contain not more than five concepts or messages, in order to avoid clutter." Try for three to five specific criteria.

When your project is completed, evaluate how well you satisfied each individual criterion.

II. Evaluate how well you succeeded in meeting both the specific and general criteria. You may do this with a 1 to 5 grade following each criterion, or with a paragraph of explanation.

Assign an overall grade to the product at the bottom of the form. It should reflect the average of the individual evaluations.

## Independent Project Proposal

Your name:

Date:

Hour:

Describe the proposed activity:

What will be your product?

Who will be your audience?

Number of points requested: _____ points

## Activity Record 1996-1997 Honors Physical Science

**Student's Name:**

| Independent Activity | Completed Sat. | Completed Unsat. | Sat. | Points | Chap. | Design Your Own | Biog. |
|---|---|---|---|---|---|---|---|
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## Activity Record 1996-1997 Honors Physical Science

**Your Name:**

| Independent Project | Points |
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Resources Available for Compiling Independent Projects

(Resources are selected to correlate with a specific content objective and take advantage of a particular learning model.)

I. Use available materials for teacher-defined activities:

* Textbooks - activity ideas from teacher's edition

* Professional society literature - for example NEA or the society in your particular content area

* Current events - newspapers and magazines for issues and dilemmas affecting society

* Your own ideas or those borrowed from other teachers
  9 Week or Semester project activities
  Topics and activities which won't fit into the regular curriculum
  Culminating activities from OBE classes

II. Emphasize student-defined projects. In these cases the student will provide the idea, or modify one of your suggested ideas.

## Products

1. a letter
2. a lesson
3. advertisement
4. annotated bibliography
5. art gallery
6. block picture story
7. collage
8. collection
9. collection with 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. map
39. letter to the editor
40. map with legend
41. mini-center
42. mobile
43. mural
44. museum exhibit
45. newspaper story
46. model
47. oral report
48. pamphlet
49. photo essay
50. pictures
51. picture dictionary
52. picture story for children
53. poem
54. porta-center
55. poster
56. project cube
57. puppet
58. puppet show
59. rebus story
60. riddles
61. scavenger hunt
62. science fiction story
63. scrapbook
64. sculpture (clay, wire, junk)
65. seek and find
66. skit
67. small scale drawing
68. song
69. songs (collection)
70. stencil
71. story
72. street map
73. survey
74. tape
75. terrarium
76. text book
77. time line
78. transparency for overhead projector
79. travelogue
80. TV news report
81. video tape
82. vocabulary list
83. worksheet
84. written report

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