

DESIGN AND
DRAWING FOR
PRODUCTION
SYLLABUS

The University of the State of New York
THE STATE EDUCATION DEPARTMENT
Albany, New York 12234

August 1989

TO:

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INTRODUCTION

Syllabus goal:

The ultimate goal to be achieved when providing instruction through Design and Drawing for Production is to equip each student with the necessary knowledge and skills needed to reach full potential as a human being. This syllabus provides experiences for the student to function as a more skillful and knowledgeable citizen in society in relationships to employment, community, environment, family and self.

Syllabus rationale:

Design and Drawing for Production, formerly entitled Mechanical Drawing and Design encourages visual problem solving using a common graphic language to describe forms in the human made environment. To enable the student to analyze, creatively design and critically evaluate these forms, the syllabus requires researching for historical precedents, cultural references, environmental impact and future vision.

This syllabus is an attempt to deviate from the conventional learning methods and application of skills through a follow up exercise to a more exciting design problem approach. It provides experiences for the student to be given a design problem and present a solution in design and drawing exercises.

This type of approach is the vehicle for worldwide industrial communication and an integral step in the process toward product design and production. Other simulation techniques such as model building help develop an ability to analyze and demonstrate an understanding of three dimensional forms in space. Application of these design and drawing activities and simulation techniques ultimately result in the manufacturing of products, design of transportation systems, generation of communication and the construction of buildings.

Syllabus content:

The style of presentation for this syllabus evolved from the way industrial, engineering and architectural firms solve their design problems and communicate their solutions. The syllabus emphasizes critical thinking, creative problem solving and the decision making processes by requiring the student to examine past solutions, learn technical drawing processes, experience design techniques and become critically active in evaluating both personal work and the work of others.

Appendix C lists potential health risks in a classroomically used by the students involved in the implementation of this syllabus. Appendix D mentions considerations for students with handicapping conditions. Appendix E mentions considerations for educating the gifted student. Appendix F provides information pertinent to the credit given to a student receiving instruction through this syllabus with regard to the Visual Arts Education or Technology Education Sequences. Appendices G, H and I provide information to the teacher as to where a course implementing this syllabus fits into the Visual Arts Education and Technology Education sequences. Appendix K lists additional ideas or suggestions for other possible Design Activity Briefs.

Syllabus Usage:

The success of a course implementing this syllabus depends on the creativity, ambitions and initiative of the teacher, in creating an atmosphere of excitement and qualitative instructional experiences.

After carefully reading the entire syllabus, refer again to Scope and Sequence (pp. 16-17) to become familiar with the six technical drawing areas to be covered in the semester course. Then refer to the initial Design Activity Brief (p. 7) and the Typical Example pages (pp. 2-31) to get a more specific idea as to how to cover the technical drawing areas by providing design and drawing experiences to your students.

Always refer to the Design/Production Process (pp. 20-21) and parallel it with the Design Activity Brief in progress. This will allow for student knowledge and awareness of his/her experiences pertinent to the real life processes experienced throughout engineering, industrial and architectural firms.

STRATEGIES FOR INSTRUCTION

Refer to the SAMPLE DESIGN ACTIVITY BRIEFS section (pp. 32-56) to view specific exercises providing the student with experiences in one or more technical drawing areas. A blank form

is available for your use when developing your Design Activity Brief.

To successfully utilize Design and Drawing for Production the teaching 8TJ ET EMC 761 Tr 11.52 0

economy of means.

8. assist teachers at the elementary level in teaching design and technical drawing.
9. recognize the duality of the program that exists in this redesign **THE DESIGN ACT AS A CREATIVE EXERCISE and THE DRAWING ACTIVITY AS COMMUNICATION .**

Design and Drawing for Production

DESIGN ACTIVITY BRIEF

TECHNICAL DRAWING AREA: Choose one of the six major technical drawing areas to be covered this year. Subgroups, such as isometric, should appear in parenthesis.

DESIGN ACTIVITY:

1. These statements should be made in narrative form, perhaps as a ~~sensation~~ ~~description~~ describing a need to be fulfilled.
2. Specific criteria for the successful design and drawing should be stated, offering guidance for the problem solver as well as considerations toward evaluation. To avoid complex design solutions which ~~olve~~ drawing skills exceeding the capability or experience of the students, care should be exercised in selecting and stating the design problem. The design problem should be structured to focus on and achieve the limited number of objectives identified ~~of~~ the period of instructional time by the teacher. Lack of precision in specifying criteria in stating the design problem may create a need for considerable individual instruction evolving from misinterpretation.
3. Critical thinking and creative ~~problem~~ solving skills need to be emphasized as important processes in this step.

RESEARCH AND CRITICAL ANALYSIS: The teacher and/or students should analyze the nature of the problem and its ramifications. Environmental, societal and cultural impacts ~~need~~ to be considered.

HISTORICAL REFERENCES: Historical precedents and futuring must be revealed in lecture, discussion or additional activities. Visual aids, slides, video, models, media, other print

GOALS AND OBJECTIVES

The development of this syllabus resulted from Statement of Regents Goals for Elementary and Secondary School Students 1984

STATEMENT OF REGENTS GOALS FOR ELEMENTARY AND SECONDARY -SCHOOL STUDENTS - 1984

The Regents Statement of Goals for students includes skills and characteristics which each student should acquire through education. Responsibility for education is shared by the family, schools and other organizations in each community. Action Plan to Improve Elementary and Secondary Education Results in New York focuses on the actions schools can and must take to help students meet these goals.

Our Action Plan is directed toward what children in New York should be, should know and should be able to do. Our expectations and standards set for them reflect an anticipation of the knowledge, skill and capacity they must have to meet ever more rigorous challenges for employment and economic competition for carrying their obligations in the governance of our democratic republic; for meeting their responsibilities to family, self and community; and for the perpetuation of culture and civilization in New York.

The goals, expectations and aspirations to be realized through the schools are the same for all. However, all children are not the same. They have different talents and abilities, interests and emotions, strengths and weaknesses. For each individual we desire an educational system that will both stimulate and urge the full development of potential. We must, therefore, provide considerable choice and flexibility for each student together with basic requirements. We want each child to develop self-confidence and a belief in the success in learning. We want each to develop a capacity for continued self-learning. We want each to develop self-discipline and a sense of decency and responsibility.

In order to put those objectives for self-development in the perspective of what is necessary for the individual to contribute to and succeed in society, we have the more general standards and credentials for all. These provide the societal guideposts to indicate what is necessary for the individual to contribute to and succeed in society.

4. Each student will acquire knowledge about political, economic, and social institutions and procedures in this country and other countries. Included are:
 - 4.1 Knowledge of American political, economic, and social processes and policies at national, state, and local levels.
 - 4.2 Knowledge of political, economic, and social institutions and procedures in various nations; ability to compare the operation of such institutions; and understanding of the international interdependence of political, economic, social, cultural and environmental systems.

5. Each student will respect and practice basic civic values and acquire the skills, knowledge, understanding, and attitudes necessary to participate in democratic government. Included are:
 - 5.1 Understanding and acceptance of the values of justice, honesty, discipline, due process, equality, and majority rule with respect for minority rights.
 - 5.2 Respect for self, others and property as integral to a self-governing, democratic society.
 - 5.3 Ability to apply reasoning skills and the process of democratic government to address societal problems and disputes.

6. Each student will develop the ability to understand and respect people of different race, sex, ability, cultural heritage, national origin, religion, and political, economic, and social

8. Each student will develop general career skills, attitudes, and work habits and make a self assessment of career prospects.
Students not directly pursuing postsecondary education will acquire ~~level~~ employment skills.

9. Each student will learn knowledge, skills, and attitudes which enable development of:
 - 9.1 Self-esteem.

 - 9.2 The ability to maintain physical, mental, and emotional health.

 - 9.3 Understanding of the ill effects of alcohol, tobacco, and other drugs.

10. Each student will develop a commitment to lifetime learning with the capacity for undertaking new studies, synthesizing new knowledge and experience with the known, and refining the ability to judge.

This syllabus allows for the Regents Goals to be achieved either directly or indirectly through

- o develop design and drawing skills to express personal ~~creative~~ ~~talents~~.
- o develop consumer, personal, occupational and relationship skills to enhance his/her abilities to meet ~~responsibilities~~ ~~responsibilities~~ in the home and workplace.

Objectives:

The following objectives have been developed as a framework for guidance ~~regardin~~ ~~regardin~~
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6. understand art as being bias free with respect to job ~~ability~~
7. experience the introduction and integration of computer assisted design and drawing as a means of producing desired results.

SCOPE AND SEQUENCE

The usage of Design Activity Briefs to experience all six technical drawing areas provides challenge and excitement to the student. The syllabus is planned to provide one unit of credit and encompass two semesters of instructional time. For a student to receive full h6(r)10(p)10(a)6(s232(h

There is no suggested sequence for covering the technical drawing areas. Even if the teacher intends to cover just one area there may be random ~~times~~ leading to the opportunity to experience others simultaneously.

The instructional time needs to be organized and budgeted in such a way to ensure that during the year student activity is scheduled to cover all six technical drawing areas adequately. Consequently, students will have the ability to demonstrate and utilize the basic concepts and conventions of technical drawing that would be expected at this age/grade level. Of equal importance, the student will know how to use reference books and materials to acquire more detailed information which may be needed.

The elements and principles of art are to be an integral part of the learning process. (See Appendix J) The Design Activity Brief is the mechanism to allow for coverage of the elements and principles of art in the Design Activity. Students should understand that the design process is the basis for visual organization, and a process common to the practice of fashioning images into ~~to~~ form visual communication.

The six technical drawing areas are to be considered comparable to a tool chest. ~~areas.~~ The teacher should cover each and focus on the minimum conventions inclusive of each, as needed. The

EVALUATION STRATEGIES

The following evaluation guidelines suggest ways that student progress toward the achievement of the course objectives can be assessed. The information below is suggestive of the possible categories and percentages that an instructor would use for the evaluation of students during each Design Activity Brief.

a.

7. Redesign after client rejection;
Adjust and resubmit
8. Consult with manufacturing, marketing, environmental and other design groups for additional input
9. Working drawings made
10. Prototypes developed
11. Field testing
12. Acceptance of market or adjust or reject/cancel
13. Mass production

DESIGN: Adherence to design criteria, ease of use, flexibility of assembly, use of color.

DRAWING: Arrangement of views on sheet, technical accuracy, correct representation of objects, adherence to standard drawing conventions.

Design and Drawing for Production
DESIGN ACTIVITY BRIEF

TECHNICAL DRAWING AREA: ORTHOGRAPHIC PROJECTION

DESIGN ACTIVITY: Perhaps no domestic furnishing has ~~changed~~ changed more drastically than the clock.

No longer constrained by its mechanism, the face becomes arbitrary, dependent only on the dictates of fashion, style and public acceptance. The wha8(c)6(h)10(a,)7(a(c)6(Tw 056(a)653b7e6

Design and Drawing for Production

DESIGN ACTIVITY BRIEF

TECHNICAL DRAWING AREA: PICTORIAL (oblique)

DESIGN ACTIVITY: Though more shoes are currently being designed (some even engineered) for more uses than ever before, urban pedestrians continue to walk between fashion and comfort.

Suppose you were a professional at work in a major city. What would you look for in a shoe?

Design a shoe for a male or female who works inside an office, sits 80% of his/her work day and commutes to work via mass transportation. The shoe should make a statement and offer style to suit the function.

Today's consumers are more than ever exposed to the influence of design in everyday objects. High quality design has spread to every imaginable object, from coffee makers. When people choose a finely designed clock, lamp, vase or decorative accessory, they are making a statement. A product is something to live with, not just a functional object.

RESEARCH AND CRITICAL ANALYSIS: Collect catalogs with visual displays of shoes described by stores such as: Bloomingdales, Bambergers, Berdorf/Goodman and L.L. Bean. Collect interviews from the people

LINKAGE: In order to better understand the process in production, the design for function must be dissected and planned in a pattern form so that manufacturing is feasible.

STUDENT REQUIREMENTS & CRITERIA FOR EVALUATION

DESIGN: Based on the individual student's visual description, does the design offer comfort or any other functional criteria supported by the purpose?

DRAWING: This drawing should offer communication for the purposes of production. The 3 transition should allow more understanding of the garment. Basic marker and pencil techniques should be utilized in the initial rendering.

isometric on a 12"x18" sheet of vellum. Make drawing full size or enlarge if larger drawing will make better presentation. Color drawing with pencils or markers. Dimension appropriately.

LINKAGE: Consider the type or kind of materials or combination of materials to be used in the manufacture of the lure.

Processes of manufacturing and assembly should be considered. What materials are appropriate to withstand the stress and environmental factors? What are the effects of color, noise, movement, scent, texture and materials selected on attracting and hooking bass?

STUDENT REQUIREMENTS & CRITERIA FOR EVALUATION:

DESIGN: The lure can be expected to attract and catch bass. The design should be a different concept. The company should be able to produce the lure through manufacturing. It should withstand normal use. The design should have sales appeal to fishermen.

DRAWING: The final isometric drawing should be correctly represented and dimensioned. Appropriate techniques should be utilized to draw curved surfaces. The preliminary sketches are submitted. Coloring should assist visualization.

pays, who rides, where should it be built, etc.?

STUDENT REQUIREMENTS & CRITERIA FOR EVALUATION:

DESIGN: An examination of the criteria should be revealed in the design. Could the design accommodate students? Were allegations for the year 2000 addressed? Did the student adhere to the Education Law?

DRAWING: The drawing should include an elevation plan and section view. The section view should conform to accepted standards and conventions. All work should be neat and dimensioned properly.

DESIGN: Does the design express a solution to the need of the development of a vehicle designed to alleviate the stress of urban commuting and the congestion we currently endure?

DRAWING: Does the visual communicate the materials used for the vehicle in using the section?

Design and Drawing for Production
DESIGN ACTIVITY BRIEF

TECHNICAL DRAWING AREA: SECTIONS

DESIGN ACTIVITY:

DESIGN: Interesting design, application of building materials, ease of construction.

DRAWING: Technical accuracy, neatness, line definition, materials list.

Design and Drawing for Production
DESIGN ACTIVITY BRIEF

TECHNICAL DRAWING AREA: SECTIONS

DESIGN ACTIVITY:

Modernism".

DRAWING: Technical accuracy, layout on sheet, use of pens, neatness.

Design and Drawing for Production
DESIGN ACTIVITY BRIEF

TECHNICAL DRAWING AREA: AUXILIARIES

DESIGN ACTIVITY: A medical supply company has determined that there is a need for a specialized vertical container with a lid. It must be easily recognized through its form and color.

The container must hold a minimum of 16 fl. ounces and not more than 20 fl. ounces. Its top must be truncated on a 30 degree angle. The lid should be flexible, stay secure to the body of the container, prevent leakage and allow a 1/4" tube to go through it parallel to the sides of the container. The tube should be held snugly as it goes through the lid. The container must be unbreakable, safe, light, inexpensive and resistant to corrosion. Scale is 1:1.

RESEARCH AND CRITICAL ANALYSIS: Student will collect, observe and investigate a variety of lidded containers. Research formulas for determining appropriate size of container, dependent on form used.

HISTORICAL REFERENCES: Present examples of containers past and present and how technology influences their design.

SKILLS: Consider preliminary sketches; include location and size dimensions, appropriate drawing conventions and use of felt tip markers.

LINKAGE: How will materials affect cost and practicality? What types of containers manufactured would be the most cost efficient?

STUDENT REQUIREMENTS & CRITERIA FOR EVALUATION:

DESIGN: Does the design conform with the criteria as stated? Have the needs of the client been adequately satisfied?

DRAWING: Does the drawing explain the designer's idea through appropriate drawing conventions and the technical drawing art? Does it indicate accuracy in measuring proper line weight, projection quality lettering and overall neatness?

DRAWING: Is drawing correctly executed? neat, accurate, etc.?

Design and Drawing for Production

DESIGN ACTIVITY BRIEF

TECHNICAL DRAWING AREA: REVOLUTIONS, ORTHOGRAPHIC PROJECTION

DESIGN ACTIVITY: The all nanosecond whistling choir of the First Church of Computer Scientists whose motto "Computer Over Matter" is in need of a new church "trademark" steeple. The steeple must be simple in form, symbolic of its beliefs, and rotate at its base. The choir wishes to see a proposal which will show the "trademark" steeple from many different angles.

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DRAWING:

STUDENT REQUIREMENT & CRITERIA FOR EVALUATION:

DESIGN: Many designs are critiqued by panels or groups of people. Select four students who will act as design critics. These critics will divide the designs into three categories: Good, Better and Best.

DRAWING: Are the views properly done? Does the design match the color scheme?

STUDENT REQUIREMENTS & CRITERIA FOR EVALUATION:

DESIGN: The project should demonstrate the application of the reference and symmetry in an exciting design, including graphics.

DRAWING: The project should fold evenly with all tabs in place. Drawing conventions, fold lines, cut lines and center lines must be evident. The best pieces will have a great deal of detail.

STUDENT REQUIREMENTS & CRITERIA FOR EVALUATION:

DESIGN: Does the structure enclose an adequate amount of space to allow for sitting, sleeping and adequate ventilation?

DRAWING: The final product is a model which is the product of a drawing. Most drawings are a representation of the final product. In this case the final product is shown.

Design and Drawing for Production
DESIGN ACTIVITY BRIEF

TECHNICAL DRAWING AREA:

DESIGN ACTIVITY:

RESEARCH AND CRITICAL ANALYSIS:

HISTORICAL REFERENCES:

SKILLS:

LINKAGE:

STUDENT REQUIREMENTS & CRITERIA FOR EVALUATION:

DESIGN:

DRAWING:

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APPENDIX A

COMPUTER ASSISTED DESIGN AND DRAWING

A generic description of hardware and software appropriate to DDP is listed below. These materials represent systems that are the equivalent of, or comparable to, equipment currently used or being employed in the design professions.

. IBM compaAPPENDIX A

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Steel edge for cutting
Disposable blades or knives
White glue
Balsa wood 1/8" sticks
Clay - ceramic
Thin wire - 16 - 18 gauge
Needle nose and Linesman's Pliers
Graphic tapes
Glue gun
Templates
Drafting tape
Eraser and shields
Tone film sheets (zipatone)
Instant transfer lettering
Perspective or designer's grids

APPENDIX C

POTENTIAL HEALTH RISKS IN THE CLASSROOM

Design and Drawing for Production involves the use of markers, paints, inks, ~~seglies~~, clays. It is important for teachers to know what supplies consist of and be cognizant of this information.

The following information is adapted from an April 19, 1983, memo titled Chemical Use in Schools by Brian P. Walsh, Administrator for Educational Facilities and Management Services of the New York State Education Department.

During the past few years, there has been widespread publicity about the potential danger posed to students by chemicals used in schools. Consequently, ~~many officials~~ have requested guidance in deciding which chemicals should or should not be used in schools.

In response to those requests, the State Education Department has developed recommendations in the form of guidelines that school officials may ~~use~~ decide which chemicals can be used with relative safety in schools.

The State Education Department surveyed a group of school districts to determine the identity of chemicals being purchased by schools in the State. The inventory derived from ~~inventory~~ was given to the State Health Department for analysis.

Based on the analysis, the State Education Department recommends the following:

- o Any chemical that is identified as a known carcinogen should not be used on school premises.
- o Any chemical that is identified as being a known or suspected mutagen and/or suspected carcinogen may be used for instructional purposes ~~only~~ only under the close supervision of properly trained teaching personnel.

The following items, which comprise only a ~~partial~~ sampling of items commonly found in schools, may contain known or suspected carcinogens:

- | | |
|-----------------------|----------------------------|
| o Acetamide | o Electroplating solutions |
| o Asbestos | (copper, nickel) |
| o Benzene | o Indigo carmine |
| o Cadmium chloride | o Indole Butyric Acid |
| o Carbon tetrabromide | (Hormodin) |
| o Chloroform | o Isoamyl alcohol |
| o Chromium oxide | (Isopentyl) |
| o Diarsenic trioxide | o Isobutyl alcohol |
| o Lead acetate | o Nickel Sulfate |

- o Manganese chloride
- o Methyl iodide
- o Methyl methacrylate
- o Nickel
- o Phenol
- o Propanol
- o Tanric acid
- o Vinyl chloride

Some toxic substances are:

- o Ammonia (found in xerox machines)
- o Duco Cement
- o Duplicating fluids
- o Rubber cements
- o Modeling plasticine clay
- o Some markers
- o Thinner
- o Spray adhesive
- o Spray crayon

The teacher needs to be aware of:

- o any allergies a student may have,
- o

APPENDIX D

STUDENTS WITH HANDICAPPING CONDITIONS

The Board of Regents, through revising the Part 100 Regulations of the Commissioner and the Action Plan, has made a strong commitment to integrating the education of students with handicapping conditions into the total school program. According to Section 100.2(s), "Each student with a handicapping condition, as such term is defined in Section 200.1(ii) of this Chapter, shall have access to the full range of programs and services set forth in this Part to the extent that such programs and services are appropriate to such student's special educational needs." Districts must have policies and procedures in place to make sure that students with handicapping conditions have equal opportunities to access diploma credits, courses, and requirements.

The majority of students with disabilities have the intellectual potential to master the curricula content requirements for a high school diploma. Most students who require special education attend regular education classes in conjunction with specialized instruction and/or related services. All students must attain the same academic standards as their nonhandicapped peers in order to meet these requirements. For this reason, it is very important that at all grade levels students with handicapping conditions receive instruction in the same content areas so as to receive the same informational base that will be required for proficiency statewide testing programs and diploma requirements.

The teacher providing instruction through this syllabus/ curriculum has the opportunity to provide an educational setting which will enable the students to explore their abilities and interests. Instruction could be provided to handicapped students either by teachers certified in this subject area or by special education teachers. Teachers certified in this subject area would be providing instruction to handicapped students who are recommended by the Committee on Special Education (CSE) as being able to benefit from instruction in a regular educational setting and are appropriately placed in this setting. Special education teachers may also provide this instruction to a class of students with handicapping conditions in a special class setting.

Teachers certified to teach Design and Drawing for Production should become aware of the needs of those students with handicapping conditions participating in their classes. Instructional techniques and materials must be modified to the extent appropriate to provide students with handicapping conditions the opportunity to meet diploma requirements. Information or assistance is available through special education teachers, administrators, the Committee on Special Education or a student's IEP.

Strategies for Modifying Instructional Techniques and Materials

1. Prior to having a guest speaker or taking field trips, it may be helpful to structure the situation. Use of a checklist or a set of questions generated by the class will help students focus on relevant information. Accessibility for students with handicapping conditions should be considered when field trips are arranged.
2. The use of computer software may be appropriate for activities that require significant amounts of writing by students.
3. Students with handicapping conditions may use alternative testing techniques. The needed testing modifications must be identified in the student's Individualized Education Program. Both special and regular education teachers need to work in close cooperation so that the testing modifications can be used consistently throughout the student's program.
4. Identify, define and pre-teach key vocabulary. Many terms in this syllabus are specific and may need continuous reinforcement for some students with handicapping conditions. It would also be helpful to provide a list of these key words to the special education teacher in order to provide additional reinforcement in the special educational setting.
5. Check periodically to determine student understanding of lectures, discussions, demonstrations, etc. and how this is related to the overall topic. Encourage students to express their understanding. It may be necessary to have small group discussions or work partners to determine this.

is reviewed when the student is determined to no longer need special education services. modifications are to be used consistently throughout the student's educational program. Principals ensure that students who have been identified by CSE as educationally handicapped are provided the alternative testing techniques which have been recommended by CSE and approved by the Board of Education.

Alternative testing techniques which have been specified on student IEPs for use by a student must be used consistently in both special and regular education settings. Regular classroom teachers should be aware of possible alternative testing techniques and should be skilled in their implementation.

The coordination and cooperation of the total school program will assist in providing the opportunity for a greater number of handicapped students to meet the requirements needed to pursue a high school diploma. The integrated provision of regular education programs, special education programs, remediation, alternative testing techniques, modified teacher techniques and materials, and access to credit through alternatives will assist in enabling such students to pursue high school diplomas to a greater degree. The teacher who provides instruction through this curriculum has a unique opportunity to assist such students in their individual goals.

Additional information on alternative testing modifications is available in the manual entitled Alternative Techniques for Students with Handicapping Conditions, which can be obtained from:

New York State Education Department
Office for Education of Children with
Handicapping Conditions
Room 1071 Education Building Annex
Albany, NY 12234

Infusing Awareness of Persons with Disabilities Through Curriculum

In keeping with the concept of integration, the following subgoal of the Action Plan was

STRATEGIES FOR WORKING WITH STUDENTS WITH HANDICAPPING CONDITIONS RECEIVING INSTRUCTION THROUGH THIS SYLLABUS

1. Instructors and administrators should investigate the ~~simplicity~~ ^{availability} of computer software that is adapted to the special ~~needs~~ of some students with handicapping conditions. Such adapted software may, for example, allow students to access a program using fewer commands. Information can be obtained by calling The Special Education Software Center, a nationwide clearinghouse (800) 327-5892.

2. Some students with handicapping conditions may need special considerations regarding physical accessibility of the drawing classroom. Instructors and administrators should assure that classroom entry, classroom space and tables, ~~desks~~ ^{seats}, computer equipment, etc. can be reached and used by students with limited physical ability. Other possible modifications of instruction and materials may include:
 - o large print materials for some students with visual problems;

 - o modified ~~seating~~ for students with hearing impairments (seating which allows students to maximize their visual potential); or for students with behavior problems (seating which allows maximum independence for students who do not perform well in certain group configurations);

 - o patterns of organization of materials, tools, etc. for students who will benefit from organization and a structured environment;

 - o clear and explicit directions and warnings that will assure safety for all students in the drawing room.

3. All students with handicapping conditions should be able to participate in appropriate ~~clean~~ activities that are part of the expectations of most drawing programs.

In establishing goals, objectives, programs, and evaluations for gifted students, the art education/technology education teacher should have all possible information about a student's placement. However, before designating a student as gifted, the art education/technology education teacher should be familiar with the various categories employed by the local school district.

IDENTIFICATION

Since there is no Statewide identification procedure for identifying gifted students, each school district develops its own identification procedures. Some typically used procedures include a combination of:

- o Behavior rating scales,
- o Teacher nominations,

the School of Media Arts at the State University of New York at Buffalo.

Information about resources and/or programs can be obtained from:

The New York State Education Department
Bureau of Art, Music, and Humanities Education
Room 681 Education Building Annex
Albany, NY 12234

APPENDIX G

APPENDIX H

TECHNOLOGY EDUCATION 3 -UNIT HIGH SCHOOL SEQUENCE

1/2 Unit Introduction to Occupations* (1/2 unit)

1 Unit Foundation Courses (Choose two for 1 unit)

Materials Processing
Energy or Energy/power***
Graphic/Electronic Processes***
Electricity/Electronics
Technical Drawing or the first half unit of
Design and Drawing for Production

1/2 Unit Systems Course (Choose one)

Production
Communications
Transportation
Manufacturing***
Construction***

1 Unit Electives (Choose two)

Any Foundation and System Course not completed previously.

- * This must be the ~~two~~ required 1/4 unit modules; the elective modules of I.O. are provided within the remaining components of this sequence.
- ** This entire 1 unit course may be used to complete the elective portion of this sequence if the first half-unit was not used as a ~~F~~ foundation course.
- *** These courses are under development.

COMPONENT DESCRIPTIONS

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when they are thought of as tools for analyzing and comprehending design experiences. They are best learned by being infused into the design activity. All of the elements of art are interrelated and should not be thought of as separate entities.

APPENDIX K

Idea File - Possible Design Activity Briefs

Following is a list of suggested topics to be used when developing design activity briefs, this list is only a beginning "Idea File" to assist the ~~teacher~~ Teachers should not hesitate to develop their own creative ideas that will expand this appendix.

Device to remove cooking rack from hot oven

LOGOS

Paper napkin holder for restaurant table

Folding brush, comb, and mirror set to fit into a pocket

Portable compact disc player

Watering device to provide measured amount to plants

Easy tie, quick release device to hold shoelaces together

Automobile steering wheels or wheel cover

A product that serves as a food container for a child's size hamburger also as a child's toy

Planters for outside decks

A sidecar for a bicycle

An end table with a secret compartment to store valuables

An ice cream container that when being opened, will premeasure equal portions of ice cream

An exotic carrying cage of song birds

A telephone for the year 2050

A box for shipping one dozen fresh eggs through the postal system

A letterhead design

A three dimensional puzzle

An exterior automobile design for the twenty-first century

A carrying case for a fisherman's food and reel

A garden cart