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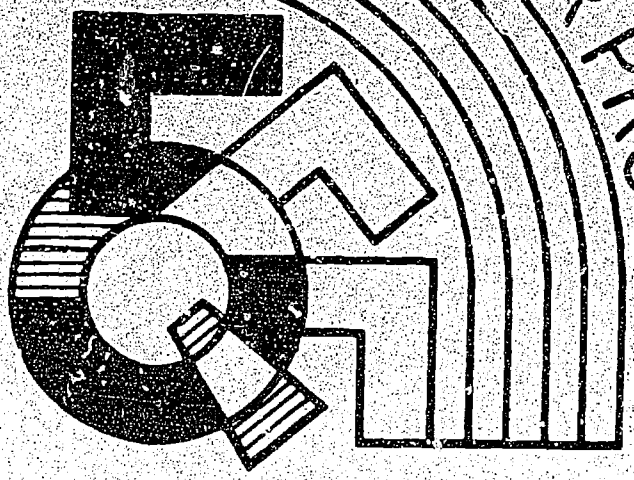
ABSTRACT

The Quinmester Visual Arts Education Curriculum, of which this is one course of study, is described in SO 007 721. In this course on kinetic sculpture, or three dimensional forms that move, students become familiar with sculpturing techniques and vocabulary, with four kinetic sculptors and their work, with correct and professional attitudes toward materials, and with procedures in an art studio. Aids to the teacher in terms of hints, studio procedures, and lists of materials, and to students in the form of work sheets on formulating an idea, selecting materials, methods of construction, surface treatment, and base design and creation are included. A vocabulary list and resource list complete the guide. (JH)

AUTHORIZED COURSE OF INSTRUCTION FOR THE QUINMESTER PROGRAM



DADE COUNTY PUBLIC SCHOOLS

ART EDUCATION

KINETIC SCULPTURE
6683.09

DIVISION OF INSTRUCTION • 1971

KINETIC SCULPTURE

(Tentative Course Outline)

6683.09

6681.08

6682.08

ART EDUCATION

Written by: Edward R. Dubocq

for the

DIVISION OF INSTRUCTION
Dade County Public Schools
Miami, Florida
1971

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PREFACE

Learning has been referred to by many contemporary educators as a noun; but it is a verb experience--full of action and involvement, doing and being. At least it should be--and that kind of involved learning is what this course of study is all about.

The Quinmester Visual Arts Education Curriculum construct is a long range developmental effort directed towards providing a general education for learners in the aesthetically related art education field. To accomplish this goal, instructional courses of study have been developed basically for teachers by teachers. Many Dade art specialists in various arts media have been recruited by the Art Office to write over 75 new and innovative courses of study in the area of art education. Educational specialists from the four corners of this land, along with aestheticians, social critics, and behavioral scientists have hailed the philosophy of the overall art curriculum construct undertaken by the Division of Instruction to be consistent with the latest national trends in art education, and to be an exemplary example of "success" oriented curricula designed to provide intense involvement in aesthetics and creative arts through group and individualized participation on the part of the learner.

All courses of study produced have been constructed with one major goal in mind: to provide a broad framework of goals and objectives; content; instructional procedures and strategies; and suggested learning activities. Many of the technically oriented courses of study list a variety of "Work Sheets" designed to assist the learner with specific and highly technical studio procedures delineated in a manner so that art specialists (teachers) can use them "as is," or utilize the source information as a basis for producing "Learning Activities Packages." The appendix may include other pertinent material needed for today's contemporary art curriculum, e.g., vocabulary, resources for both learner and teacher, etc.

Constructive criticisms or recommendations relating to this publication are invited; please send to: Art Education Office, Room 300, Lindsey Hopkins, A-1.

Charles M. King, Consultant
Art Education

I. COURSE TITLE

KINETIC SCULPTURE

II. COURSE NUMBERS

6683.09

6681.08

6682.08

III. COURSE DESCRIPTION

An exploratory course in the creation of 3-D forms that move in part or in whole. Students develop such sculptural styles as mobiles, stabiles, and other kinetic forms using a wide variety of materials such as wood, metal, plastic and glass.

IV. RATIONALE

Sculpture: "Plastic or hard materials that have been welded, carved, engraved, molded, or constructed into a primarily three-dimensional work of art."

It is important that any student of art become acquainted with varying forms of sculpture. We are constantly surrounded by various forms of sculpture in our natural environment. Technically speaking, sculpture can entail any three-dimensional form around us, from a tree to a building. Sculpture, in one way or another, affects every day of our lives, through an object that is pleasing to the eye, or the pure functionality of a unit of sculptured steel, the modern automobile.

This Quinmester Course of Study concerns itself with the area of sculpture known as "Kinetic Sculpture." Kinetic sculpture can be defined simply as sculpture that moves, through the use of electric motors, or even wind currents. Mobiles and mechanically driven sculptures are the two primary forms of kinetic sculpture

The student will be allowed to work with a wide variety of materials and construction techniques. Emphasis will be placed on the technique of artistically constructing these materials into aesthetically pleasing sculptural forms.

V. COURSE ENROLLMENT GUIDELINES

A. Elective, grades 7-12, exploratory

B. Vocational scheme

1. To introduce the student to the area of kinetic sculpture.

2. To develop in the student an awareness of kinetic sculpture and its implications to present day surroundings.

3. To prepare the student for more advanced techniques and courses in the area of Sculptural Art.

VI. BEHAVIORAL OBJECTIVES

A. The student will demonstrate the following competencies upon completion of this unit:

1. Describe the procedures for the following kinetic sculpture techniques:

a. Formulation of Idea or Theme

b. Selection of materials

c. Methods of construction

d. Surface treatment

e. Base design and creation

2. Define, in writing, related vocabulary terms as listed in this Quimester Course of Study.

3. Differentiate among a minimum of four kinetic sculptors from past and/or contemporary movements.

4. Identify sculptors in #3 by various examples of their work.

5. Manipulate and join various kinetic sculptural materials according to their specifications.

6. Compare and differentiate among various sculptural materials and their capabilities to adhere to one another.

7. Practice the correct procedures for working in a Kinetic Art Sculpting Studio.

8. Create a minimum of two examples of kinetic sculpture.

9. Compare the types of surface treatment described in Part VIII and select one or more types for application to sculptural examples.

10. Compare the types of base designs described in Part VIII and select one or more types for application to sculptural examples.

11. Demonstrate a professional artistic attitude towards materials, fellow students, and instructor during the course of this quinmester presentation.

B. The student will demonstrate competencies under the following conditions:

1. Classroom demonstration

2. Classroom discussion

3. Individual research

4. Individual studio procedures

5. Group critiques

C. Acceptable performance will be determined by the individual instructor on the basis of the following:

1. Evaluation of classroom participation

2. Empirical testing

3. Required projects turned in for grade

4. Test items based on the performance objectives

VII. COURSE CONTENT

A. First and Second Weeks

1. Movies, slides, visuals, etc., on Kinetic Sculpture appreciation/history. (Materials may be selected from lists provided in Part X.)

2. Discussion of related terms

(Minimal vocabulary list provided in Part IX.)

3. Explanation of available literature

   a. Selected reading assignments

   b. Outlines may be required

   c. Distribution of work sheets

      (See Part VIII)

4. Explanation of studio procedures

   Care of studio and materials, proper use of storage, etc. (See Part VIII for suggested list of studio procedures.)

5. Demonstration of various techniques in kinetic sculpture

   a. Selection of theme or idea

   b. Selection of materials

   c. Methods of construction

   d. Surface treatment

   e. Base design and creation

B. Third - Ninth Weeks

1. Studio experience; students work on individual assignments in studio:

   a. Student-instructor interaction on different individual problems

   b. Instructor may create informal critiques of students work progress to create student interaction.

2. Additional instruction:

   Instructor may incorporate additional instruction as needed for re-enforcement during studio time. Ex.: additional movies, guest lectures, field trips, etc.

C. End of Ninth Week

1. Students complete and turn in projects for final critique and grading.

2. Studio is thoroughly cleaned and prepared for next quinmester course.

VIII. COURSE PROCEDURES, STRATEGIES AND SUGGESTED LEARNING ACTIVITIES

A. Procedure

(Suggested instructor demonstration aid)

The general procedures that apply to all forms of sculpture will be discussed in this section. Individual procedures for specific techniques will be listed and described on the work sheets.

The primary guideline applying to all forms of sculpture is good three-dimensional design. In sculpture, one must relate his design to a free standing form that will be viewed from all directions. One should keep this fact in mind when designing his sketches or models. If a sculpture has been well designed, it will be pleasing to the eye from any angle.

As in painting or collage, the basic design or idea should be developed through a series of thumbnail sketches. Develop an idea of what you want your piece to look like before you begin to sculpt. By doing a series of thumbnail sketches, one will discover certain forms that appeal to his or her artistic style.

Another factor to consider is the base or stand that will support the completed work of art. It is only too easy to make the mistake of designing a base that detracts from the visual effect of the sculpture itself. Remember that when a base is used, it becomes a part of the sculpture. It should relate to the sculpture and yet be subtle in its relationship.

Finally, in creating your sculpture, try to have the form show "movement." A piece of sculpture that seems to relate movement or action has a much greater visual impact than one that is stagnant or unmoving.

There are more specific and technical steps involved in this particular unit, and they will be covered in the individual work sheets.

B. Materials and supplies needed

Note: Due to the wide variety of materials that may be incorporated as subject matter in this unit, the following list is minimal and basic.

1. Varied assortment of the following:
    a. Wire
    b. Sheet metal
    c. Cardboard
    d. Plastic pieces
    e. Nails, tacks, screws, etc.
    f. Wood scraps
    g. Styrofoam
2. Also:
    a. Epoxy cement
    b. Glue
    c. Scissors
    d. Pliers
    e. Metal snips
    f. Brushes
    g. Paint
    h. String
    i. Rulers
    j. Pencils
    k. Sketch paper
    l. Monofilament line
    m. Swivels
    n. Plaster
    o. 1/2 gallon milk carton
    p. Hot wire cutter
    q. Pins (straight)

C. Studio procedures for students

(This list may be duplicated and distributed as a teaching aid.)

1. Students will at all times be expected to come to class on time with required materials and be expected to work.

2. At the beginning of each period, students will enter the studio and remain quietly in their seats until roll has been taken and all instructional announcements have been made.

3. Each student will be assigned an individual work and storage area for which he or she will be responsible.

4. Equipment will be distributed on a sign-out basis. Students will be expected to demonstrate correct care for and use of equipment.

5. At no time will any student be allowed to use, touch or move another students project or materials.

6. Monitors will be assigned in certain areas as aides to the instructor.

7. All students will be expected to stop work and begin cleanup promptly five minutes before the end of each period.

8. Students will, at all times, be expected to maintain a professional attitude towards their work, fellow students and instructor.

D. Hints for instructor

1. There are many visual aids available. Plan to order movies, slides, etc., well in advance.

2. Design the studio so that there is a specific storage area for all supplies. (This makes for a way of getting a quick check of materials before the end of each period.)

3. If equipment is at a premium (as is usually the case), have students sign them out. This will help solve the "disappearing" tool problem that sometimes arises.

4. If the class in general is progressing too slowly, the announcement of "progress grades" sometimes helps quicken the pace.

5. Have the assigned monitors check work areas at the end of each period.

6. As many various processes are involved in this unit, designate a separate area for each process to avoid contamination of materials.

7. Please try to promote completely free and yet safe artistic expression. (That is what good artists are made of.)

E. Work sheets

Note: The following work sheets have been designed as direct teaching aids for student use. They may be duplicated as is and distributed for student reference following instructor demonstrations.

WORK SHEET #1 - KINETIC SCULPTURE

Formulation of Idea or Theme

Although no art movement may in reality be credited to a single artist, the creations of Alexander Calder during the 1930's are noted as the recognized beginning of the kinetic sculpture era. Calder's work in the area of kinetic sculpture is massive. There are many books on his life and creations. They may be helpful to the aspiring artist as aids in formulating ideas for your design.

Kinetic sculpture may be more easily described if it is divided into two subcategories; sculpture involving powered movement such as motors, wind-up mechanisms, etc., and sculpture that is moved by natural forces such as wind, water, etc.

Kinetic sculpture involving motors ranges in involvement from a sculpture mounted on a revolving base, to very intricate pieces incorporating gears, levers, pulleys and other devices that cause the whole piece to move within itself. At the involved end of this spectrum the piece becomes almost as much a problem of mechanics, as artistic expression. It is for this reason that most artists tend to work towards kinetic sculpture driven by natural forces.

The most common form of nature-driven kinetic sculpture is the mobile. Calder worked primarily with mobiles and the results were very pleasing.

The final decision between a powered sculpture or nature-driven piece is up to the individual artist. Keep in mind that if you are concerned with a strong artistic approach, the nature-driven piece is more applicable.

Selection of Materials

The purpose of this sheet will be to suggest some of the many materials applicable to kinetic sculpture.

One general rule to follow in the formulation of a good piece of kinetic sculpture is to relate a feeling of lightness, or buoyancy. A mobile is constantly changing shape and moving due to the forces of air currents moving around and through it. The mobile that is created from light, delicate objects will be most active when met by these air currents. Thus, selection of light objects would be to the artist's advantage.

There are many light materials that can be utilized in kinetic sculpture, some of which are cardboard, styrofoam, toothpick forms, paper shapes, balsa wood, etc. In creating larger mobiles, some artists prefer sheet metal shapes, or pieces of fiberglass or plastic which will hold their shape when cut to large sizes. (These materials are also more applicable to outdoor pieces, which would be exposed to the elements.)

The artist need not limit himself to one basic material. Many materials work harmoniously with others, and the interaction of the two is often a desired characteristic.

Experiment with several materials, examining their strengths and weaknesses. The purpose of this sheet is to show the possibilities; the final results are obtained by the artist.

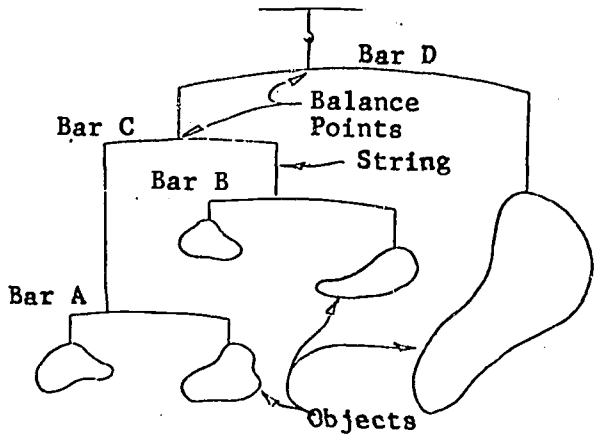
WORK SHEET #3 - KINETIC SCULPTURE

Methods of Construction

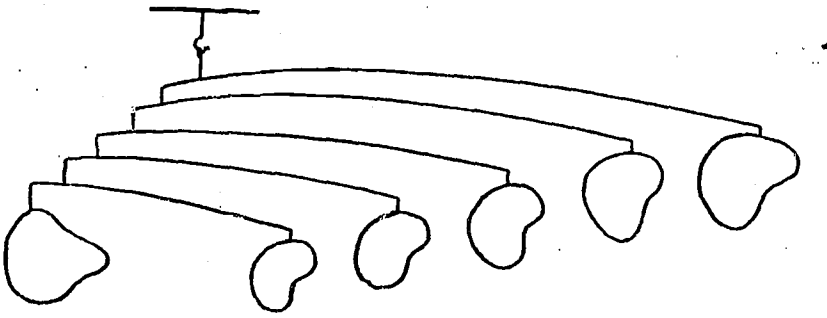
If you are using one basic material for the forms in your sculpture, there will usually be one specific joining technique for this material. However, you should not limit yourself to a single material. Try several materials in combination. For example: pieces of wood may be glued or "wired" to strips of metal. Wood and glass may be joined with epoxy resins, etc.

A. Creating a mobile

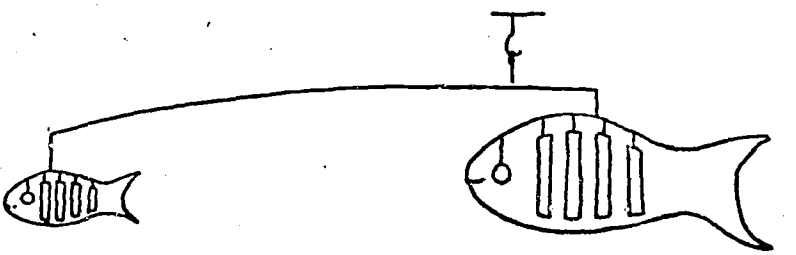
Once you have designed and created the objects for your mobile, you are ready to create the mobile itself. Following the diagram below, create bar (A) by suspending an object from each end using monofilament line. Locate the balance point on bar (A) and attach a string. Now repeat the process for bar (B). Connect the strings from bars (A) and (B) to either end of bar (C). Find the balance point of bar (C) and tie on another string at that point. Attach the other end of the string from bar (C) to one end of bar (D). Suspend a larger object from the other end of bar (D). Locate the balance point on bar (D). You may connect the balance point on bar (D) to a hook or fixture on the ceiling with a string, and you are finished.



The locations of the balance points will be determined by the weight of the objects you select. Some other designs:



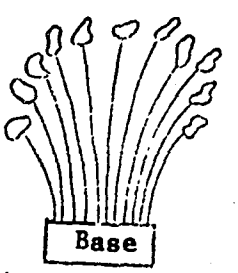
or



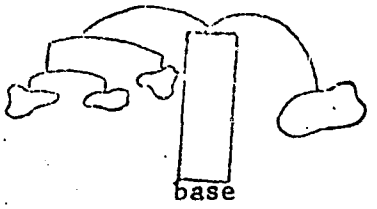
The most difficult step in creating a good mobile (other than balancing) is having all the objects swing freely without colliding. This step may be achieved only through experimentation.

Keep in mind that the cross-bars and string are secondary. They should be as delicate and hard to see as possible. The more difficult it is to see the means of support, the more effective the objects will be. The ultimate goal is to make the objects appear as if they are "floating in air."

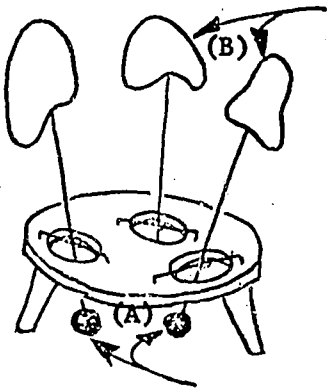
Some other examples of "nature" or wind-driven kinetic sculptures are:



Steel wires embedded vertically in a block of plaster with objects attached to the tips will sway back and forth.



A mobile that may be mounted on a base by distributing the weight below the top of the base.

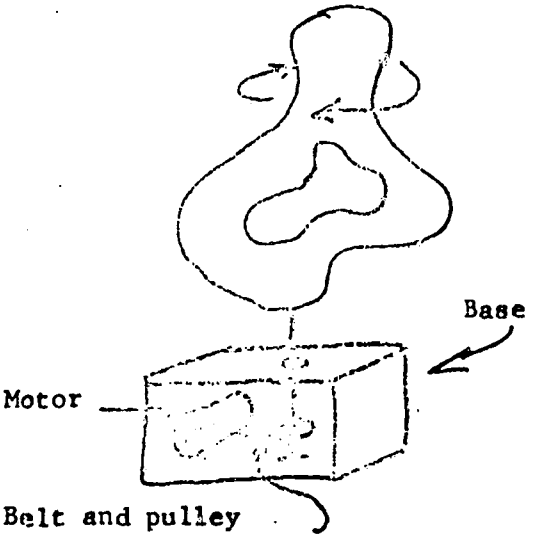


A mobile on a stand that will "rock" back and forth. (The weights below the stand (A) are heavier than those above (B).

These are only a few of the many possibilities open to the artist. Experiment and you will find many more.

B. Creating the mechanical sculpture

The most common mechanically operated kinetic sculpture is the revolving sculpture in which a solid piece revolves on a base by the use of a motor.



One of the other more common forms of motorized kinetic sculpture is the animated figurine. It is easy to see that the more you want to move mechanically, the more your system of gears, pulleys, motors, etc., is likely to become. This is why the "nature" driven sculptures such as mobiles are stressed. However, if you have a mechanically oriented mind, and the materials necessary to create a mechanically kinetic sculpture, go right ahead.

WORK SHEET #4 - KINETIC SCULPTURE

Surface Treatment

This is just a short work sheet; its primary purpose is promoting experimentation. Everybody knows the easiest thing to do when decorating posterboard is to paint it. However, is the easiest means of decoration always the most effective? Not by any means. What would happen if you sprinkled the posterboard with pieces of cork or metal flakes before painting? You may be quite happily surprised with the results.

The world of art today is exploding with new effects achieved by experimentation, and sometimes even by mistake! There is a whole world of new synthetic materials available to the artist. Get into these materials. Try to create a visual effect that has not been done before. It is hard to do, but the results are more than worth it.

Does that tempera paint on posterboard still seem so great now???

WORK SHEET #5 - KINETIC SCULPTURE

Base Design and Creation

Most mobiles will not need a base. That is to say, they will merely be suspended by string from a hook in the ceiling. However, there are some types of kinetic sculpture that do require bases. If your sculpture comes under this second category, here are some guidelines that may be of help to you:

A. Design

A base should be designed to complement the sculpture for which it is made. Most mobiles and other forms of kinetic sculpture are light and spacial in appearance. A large, heavy base would not be suitable for this type of piece.

Some sculptors have a base in mind as early as when they are still creating the piece. Keep this fact in mind.

Simplicity and harmony are the key words in good base design.

B. Media Compatibility

Basically, it is a matter of individual taste as to which material should be used in the base. Color and texture are automatically supplied with the material you select. In some instances, you may wish to alter the texture by sanding or finishing, or change the color by painting. Just remember to keep the visual impact of the base less than that of the sculpture. When a person observes the finished piece, his eyes should go to the sculpture before they go to the base.

IX. VOCABULARY LIST *

1. Armature - a framework built as a support for objects during construction.

2. Bench clamp - an adjustable, "C" shaped clamp used in securing objects to a table or bench.

3. Closed form - a form being solid in appearance; having no holes or cavities. A form that encloses space.

4. Galvanize - a protective secondary coating of metal applied to prevent corrosion.

5. Hot wire cutter - a device used to cut styrofoam.

6. Media - any substance used in the construction of sculpture.

7. Open form - a form containing hollow areas, cavities or holes (as opposed to "closed form.")

8. Patina - the surface color of an object (usually metallic.)

9. Plate - metal that is thicker than 1/8 inch.

10. Sculptor - one who sculpts or creates sculpture.

11. Sculpture - plastic or hard materials that have been welded, carved, engraved, molded, or constructed into a primarily three-dimensional work of art.

12. Sheet - metal that is less than 1/8 inch in thickness.

13. Studio - any area designed for, or in which artistic creation takes place.

14. Texture - the structure of the surface of an object.

15. Thumbnail sketch - a single (or series) of small sketches used in developing ideas on form, movement, etc.

16. Tooling - the process by which the surface of an object is scratched, hammered, etc., to achieve a desired texture.

* Definitions, in some instances, composed with the aid of the American College Dictionary, Random House, 1967 edition.

X. RESOURCES

A. For pupils

Note: It is suggested that resources marked with an asterisk be kept on hand in the classroom for student reference.

Baldwin, J. Contemporary Sculpture Techniques. New York: Reinhold Pub. Co.

* Brett, G. Kinetic Art: The Language of Movement. New York: Van Nostrand-Reinhold.

* Calder, A. Calder: An Autobiography with Pictures. New York: Pantheon Books, Random House.

Gruber, S. Metal and Wire Sculpture. New York: Sterling.

Lynch, John. How to Make Mobiles. New York: Viking Press.

Mills, John W. The Technique of Sculpture. New York: Reinhold, 1967.

* Moorey, A. & C. Making Mobiles. New York: Watson-Gupthill.

Rasmunsen, H. & Grant. Sculpture from Junk. New York: Van Nostrand-Reinhold.

* Reed, Sir Herbert. Form Space and Vision. New York: Graham Collier, 1967.

* Williams, G. R. Making Mobiles. New York: Emerson Books.

B. For instructors

Movies, slides (Available through Dade County School Board - Instructional Materials Division.)

Discovering Texture			
17'C	EJS	FAC	1-11659
20th Century Sculpture			
C	JST		1-20159

Textbooks - Those texts marked with an asterisk above are also effective as instructor resource texts.