



Interior Structure Design

Curriculum Unit 84.01.07
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This curriculum unit is about the modern and traditional house built with the influence of the Shingle Style. Most single-family houses reflect the individual's feelings and character in the design of the house in which they live. The environment in which the people live is not only reflected by the landscape outside the house, but is also landscaped into the house to continue a flow of "environmental" space. A horizontal and vertical tie of the interior spaces allow the architects to interweave the interior space with the porches and stoops attached to the exterior of the house.

The unit will be divided into four sections to aid the student into a basic design analysis and decision making program. The main objectives of the unit are:

1. The students will develop a better understanding of the concept of design.
2. The students will be able to use the proper vocabulary terms in structural design.
3. The students will be able to analyze basic plans of a modern or traditional house.
4. The students will be able to successfully reproduce a plan of a hallway.
5. The student will be able to demonstrate, with the use of a ruler, proportion in drawing their plan.
6. The students will be able to verbally explain the elements used for wall separation, windows, doors and place.
7. The students will be able to design a house plan using asymmetrical or symmetrical space.
8. The students will successfully complete an elevation drawing of their own.
9. Students will be able to create an elevation or three dimensional drawing on a flat surface.
10. The students will make a three dimensional model of an enclosed porch using the mixed media of cardboard and tissue paper.
11. The students will show their basic understanding of architectural design in their finished porch structure.

In the first section of study, the students will gain sufficient basic knowledge of the vocabulary used in structural design. The students will be instructed on Plan Analysis which includes: how to read a plan, how the structure is built, what is common space, what is private space and how it works. The aid of transparencies and slides of different plans, drawings and photographs will help the students relate the building analysis and basic design. An open discussion of the plans will help the students verbally express what they have read in the plans.

The last three sections of the curriculum will require from the students a design decision which will be shown in their final project. In the first project each student will make a floor plan of either a hallway in school or their own house. They will have to use a ruler with a pencil to draw in windows, doors, stairs and wall space. They will have to indicate private space and common space on the plan.

Once project #1 is completed, a pen and ink with watercolor elevation drawing will be made. The drawing will include a view of a side of the house or school unit that was designed in the plan of project #1. The student will now begin to relate the floor plan with the elevation drawing allowing a better understanding of the three dimensional design.

In the final project, students will be forced into a decision making process. Each student will draw a plan of an enclosed entrance porch. The student will then draw the front elevation drawing of their structural design to show what the porch will look like. To tie in their understanding of the plan and elevation drawing the student will create an actual three dimensional model out of cardboard of the proposed entrance porch.

The entire unit should take the students approximately eight weeks to complete. Upon completion of the unit, each student will have gained sufficient knowledge of total design construction.

Lesson #1 The Language of Design

Objectives:

1. The student will develop a better understanding of the concept of design.
2. The students will be able to use the proper vocabulary terms used in structural design.
3. The students will successfully be able to analyze basic plans of a modern or traditional house.

Motivation:

1. Ask the students to discuss how they might go about drawing the classroom they are now in.
2. Ask each student to draw a plan of the room on a piece of 9 x 12 drawing paper. Allow approximately 30 minutes to complete.
3. Tack all the plans up on a board. Have each student explain his plan.

4. Begin the lesson according to the procedure.

Materials:

Ditto #1 Design Vocabulary Terms

Ditto #2 Schematic Diagram and Plan

Ditto #3 A Plan

Ditto #4 Elevation drawing of Ditto #3

Transparencies: Plans and Elevations

Overhead projector

pencil Tracing paper 9 x 12

ruler White paper 9 x 12

Procedure:

(Make an outline on the blackboard for the students to follow along with to take notes.)

Distribute Ditto #1.

I. What is Space?

A. Space: An area that can establish a territory of its own. It may be small or large, temporary or permanent or it may be a house or an apartment.

B. Each area of space is usually made for a purpose. (Use example of the classroom.) Society or our culture will dictate how we should design a structure named a school, office or factory. Space will be divided up for a particular purpose inside this structure.

C. House Space is influenced by the individual's personality. It is usually a *multi - purpose* house where space is labeled bathroom, bedroom, kitchen and livingroom.

D. Personality, lifestyle, location and taste are all factors in designing space.

II. Planning Space

- A. Refer to Vocabulary Ditto #1. Take each word and fully explain the meaning of it to the students. Demonstration on the blackboard may be necessary.
- B. On the blackboard make two headings *Ambiguous Space* and *Prescribed Space* . First have the students indicate the spaces available in the school that may fall under each category. Then make a separate section indicating the spaces in a home or in an apartment. (Examples: Prescribed space-bathrooms, kitchen, custodians room. Ambiguous space, classrooms, cafeteria)
- C. Talk about the student's own private spaces at home . . . their common space.

III. Plan Analysis

A. Symbols -

1. used to indicate outside walls or separating walls. Indicate by making a heavy, thick black line.
2. Two single lines indicate window space.
3. Entrance. Indicate by a heavy dark arrow.
4. Door. Indicated by a single line with a half circle at the end.
- 5 Stairway up and down.
6. Fireplace.
7. Closets.

(Figures available in print form)

B. *Open Plan* Space is organized as a continuous flowing entity. The space is not divided up into box shaped rooms. The space flows from one room to the next. Great for group activities.
 Closed *Plan* Space is divided into separate rooms, used for a specific purpose. The bedroom space is usually separated to one section of the house and the common space is in the opposite section of the house.

C. Relating a design to total surroundings.

1. A plan using open space makes a continuous flow from inside to outside. The landscape becomes part of the plan area.
2. Entrance and walkways should relate to the house so they are inviting and flow with the interior house plan.
3. Gardens and patios should be designed to flow into the particular area created for so they become part of the plan also.

D. How to read plans

1. Distribute Ditto #2.

A. *Schematic Diagram* The first step in deciding about a plan.

- 1) Using loosely drawn circles indicate.: the use of space for each circle, the connection between them and the importance of the space by the size of the circle.
- 2) Arrows will indicate the flow of path between each place.
- 3) Refer to Ditto #2, Schematic Diagram. Have an open discussion to make the students develop an understanding of the diagram.

B. A Plan (Refer to bottom of Ditto #2)

- 1) Indicate and explain all of the symbols given to the students at the beginning of this lesson.
- 2) Show the students how the schematic diagram now is interpreted into a plan.

C. Distribute Ditto #3. Use an overhead projector to show transparencies #1 and #2. In an open discussion have the students explain both the ground floor plan and then the entrance floor plan.

Homework #1 : Have students draw the plan of the house or apartment they live in. Make sure they use a ruler and place furniture in the proper space. (Allow two nights)

D. How to indicate path and place on a plan.

path place

(figure available in print form)

(Refer to transparency #2)

1) *Path* will indicate the direction you are forced to walk through in this particular room.

Doorways, lights, chairs, T.V.'s are all influential factors to path.

2) *Place* will indicate the actual amount of space in an area not interrupted by path. (Place transparency #2 over transparency #1. Explain.)

3) Have an open discussion on path and place.

Homework #2 : Hand back house plans to students done the night before. Ask them to make an

overlay indicating path and place in their apartment or house. (Give each student a sheet of tracing paper to use as an overlay.) Allow one night.

IV. Transparencies (#3,4,5,6,7,8)

Show the series of transparencies of plans and elevation drawings. Explain and fully discuss each of the transparencies. Choose a student or two to discuss one of the plans.

A. Distribute Ditto #4 (Elevation drawing).

Discussion: Elevation drawings are made to show what the house will look like from either the front, back or side views. The drawings are done in either two dimensional or three dimensional.

B. Using the overhead projector show pictures of a house and the plans for the house. Use transparencies #3,7,8.

V. Test. Ditto #5

At the end of the unit allow the students to be tested on the knowledge gained in Lesson #1.

Answer Sheet:

I. Refer to the vocabulary list.

II. A. door

B. window

C. wall

D. stairs (up and down)

E. fireplace

III.

(Figure available in print form)

IV. Path direction you are forced to walk in a room.

Place Area uninterrupted by path.

(Figure available in print form)

Draw
a
Plan
of
V. this
room.
Plans
will
vary.

Ditto #1

Design Vocabulary Terms

1. *Analysis* To examine an existing structure or space.
2. *Design* To prepare plans for a new structure.
3. *Path* A route along which you move.
4. *Place* A particular portion of space.
5. *Boundary* Something that indicates bound or limits. i.e. walls
6. *Entry* The point or place of entering, as a doorway.
7. *Ambiguous Space* A place available for several possible purposes.
8. *Prescribed Space* A place used for a particular reason. i.e. Kitchen, Bathroom
9. *Plan* A drawing or a diagram to show how a floor of a house, a garden or park is arranged.
10. *Elevation drawing* A two-dimensional drawing of the side, front or back of a house or building.
11. *Common Space* Space that may be used by all the people. Such as: Livingroom, kitchen and Dining room. An area of entertainment.
12. *Private Space* Space used by one person or a couple. Bedrooms, bathroom or dressing rooms are examples of private space.
13. *Plot Plan* The location where the house or building is placed on the property.

Ditto #2

(Figure available in print form)

Ditto #3

(Figure available in print form)

Ditto #4

(Figure available in print form)

Ditto #5

Name_____

I. *Vocabulary* : (3pts ea) Define the following words:

- A. Path -
- B. Place -
- C. Ambiguous Space -
- D. Prescribed Space -
- E. Plan -
- F. Elevation drawing -
- G. Common Space -
- H. Private Space -
- I. Design -
- J. Entry -

II. Indicate what each symbol represents. (5 pts. ea.)

- A. B.
- C. D.
- E.

(Figure available in print form)

III. Make a schematic diagram of the first floor of your house or apartment. (15pts.)

IV. What is the difference between path and place? Indicate the symbols used for each. (10 pts.)

V. Draw a plan for this room. Indicate doors, windows, counters, tables etc. (20 pts.)

Lesson #2 Design A Plan of A Hallway in School

Objectives:

1. The students will be able to successfully reproduce a plan of a hallway in school.
2. The students will be able to demonstrate, with the use of a ruler, proportion in drawing their plan.
3. The students will be able to verbally explain the elements used for wall separation, windows, doors and place.

Motivation:

1. Ask the students to take a few notes on a piece of paper that lists the rooms in that particular hallway.
2. Show transparency #9 of Earl Hall, Southern Conn. State University Have an open discussion with the students regarding the plan.

Materials:.

9 x 12 white paper colored pencils or crayons
9 x 12 manilla paper overhead projector
ruler transparency #9
pencil

Procedure:

1. Take the students down the intended hallway that they will be making their plan.
2. Have each student indicate doorways, room numbers, bathrooms, stairwells and so on. Have them compare the new list with the one made previously in class
3. Pass out a ruler and a piece of 9 x 12 manilla paper to each student.
4. Have the students use the symbols discussed in Plan Analysis to draw their plan. Have each student practice their drawing on the manilla paper.
5. When the student is completely satisfied with the drawing, allow them to transfer the plan onto the 9 x 12 white paper.
6. Display the drawings in class. Have a critique with the students. Call on individual students to discuss their plan.

Lesson #3 Elevation Drawing Mixed Media/ Pen and Ink with Watercolors

Objectives:

1. The students will successfully complete an elevation drawing of the hallway in school.
2. The students will be able to combine the medias of pen and ink with watercolor to finish their design.
3. Students will be able to create a two-dimensional elevation of a three-dimensional drawing on a flat surface.

Motivation:

1. Show transparencies #9 and #10 (Earl Hall). Have an open discussion describing transparency #10. Refer to transparency #9 to show how both drawings are showing the same building. You may want to show the other transparencies regarding elevations to refresh the students memories.
2. Begin the lesson according to the procedure below.

Materials:

9 x 12 manilla paper Pen/ink
9 x 12 white paper watercolors
pencil water tins
rulers paint brushes
overhead projector newspaper
transparencies #9 & #10

Procedure:

1. Each student will be making an elevation drawing of the hallway designed in lesson #1.
2. Distribute one sheet of 9 x 12 manilla paper, pencil and a ruler to each student.
3. Have each student draw their elevation on the paper. Each student must get an approval from the teacher before continuing onto the next step.
4. Handout a piece of 9 x 12 white paper to the students ready for the final step. Have the student transfer the elevation on the paper.
5. Distribute newspaper and a pen with ink to each student. Have the student go over the pencil

drawing with the pen and ink. Allow to dry.

6. To add color to bricks, windows, grass and shrubs, the student will then use watercolor.

Handout paint tins, water, brushes and watercolors

7. Display all finished elevations next to the plan drawing done in class previous to this assignment.

Lesson #4 Cardboard Porch Model

Objectives:

1. The students will make a three-dimensional model of an enclosed porch using the mixed media of cardboard and tissue paper.
2. The students will show their basic understanding of architectural design in their finished porch structure.
3. The students will be able to design a house plan using asymmetrical or symmetrical space.

Motivation:

Bring in a sample, made by the teacher or a previous student, of an enclosed porch. Discuss how the plan should be drawn first and an elevation drawing second to indicate what the porch will look like. Start with procedure.

Material:

Cardboard	Pencils
Tissue paper	Rulers
Scissors	Mat knife
Glue	Magic Markers
Masking Tape	9 x 12 manilla paper
	9 x 12 white paper

Procedure:

A. Draw A Plan for a porch.

1. Distribute a piece of 9 x 12 manilla paper, pencil, and ruler to each student. Have them draw a plan for the porch. i.e. It could be square, rectangular, octagon in shape.

(Figure available in print form)

2. Once the plan is approved by the teacher, have the student transfer the drawing to the 9 x 12 white paper as the first part of their finished project. The finished project may be done in pencil or the use of magic markers may be used to indicate lines.

B. Elevation

1. Pass out a piece of 9 x 12 manilla paper to each student. Have each student draw an elevation (side, front, or both) of the porch. (Students may want to complete all of their preliminary drawings first before completing the final drawings on their white paper. This may save the student from re-doing their drawings if a correction must be made.)

2. Once the student is satisfied with both the plan drawing and the elevation drawing, he/she may put them on 9 x 12 white paper as part of their final project.

C. Cardboard Model Design

1. Pass out a piece of manilla paper to each student. The student will make a pattern on this paper for their porch design. Each pattern piece should be measured with a ruler to make sure the pieces fit.

(Figure available in print form)

2. Cut out the pattern pieces. Bend or tape the pieces together to make sure they fit into each other.

3. Transfer the pattern pieces onto a piece of cardboard. Using a scissor or mat knife, cut out design.

4. Using a pencil and ruler mark in the windows and doors. Put a frame around both.

5 Using the mat knife, cut out windows. Insert tissue paper to fit into the open space. Glue in place.

6. Doors may be drawn in pencil and details may be filled in with magic marker.

7. Fill in the details of the roof using pencil, magic marker and if sky lights are used, cut an opening and use tissue paper. All details should be done before shaping into the final steps.

Demonstrate this in class. Example:

8. Bend and mold the cardboard into the porch design. Masking tape may be used to hold the porch together.

9. Mount the porch on either a piece of cardboard, designed to look like a side of the house, or a floor mount to allow the design to become a free-standing object.

D. Display all porch designs in class with the plan and elevation drawings next to it. Have each student verbally describe what he/she has designed. The student should be able to combine all three parts into his/her critique to show the understanding of the knowledge gained in this unit.

Transparencies

1. A Plan: Ditto #3. Entrance floor shows the main living quarters. Each room is labeled, given the size of the room, the doors and windows are indicated in each of the rooms.
2. Overlay showing *path* and *place* for transparency #1.
3. A Plan: Three Room Round House.
4. A Plan: Two story Chalet.
5. A Plan: Two level Home.
6. A Plan: A Log Cabin. Main floor show an open floor plan for living room and dining room. Second level has a large room loft area which can be used for common space.
7. Elevation drawing of Ditto #3 Front.
8. Elevation drawing of Ditto #3 side
9. A Plan: Earl Hall, Southern Conn. State University. The plan shows the main hallway as you enter Earl Hall.
10. Front Elevation drawing Earl Hall. This gives the front view of the building shown in the plan on transparency #9.

Bibliography for Teachers and Students

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