EDUCATING ELEMENTARY CHILDREN THROUGH ARCHITECTURE

AN INTERACTIVE ARCHITECTURE LEARNING UNIT FOR ELEMENTARY STUDENTS

UCFA
UTAH CENTER for ARCHITECTURE

LESSON 01 - SCALE/BODY

TIES TO CURRICULA (5TH GRADE - MATHEMATICS)

Standard 5.NF.5: Interpret multiplication as scaling.
Standard 5.MD.1: Convert among different-sized standard measurement units within a given measurement system.

SUMMARY

Architects and designers have to judge the relative sizes of things. This helps them to understand weight (how heavy something appears to be), strength, and scale. The size of each part of a building or city is perceived relative to the sizes of other things around it. We know how large something is by comparing it to other objects. It is important that designers create objects and buildings that are "in scale" with their desired function and purpose, altering how someone feels in and experiences a space.

MATERIALS

Classroom/Teacher:

- rulers (metric and "feet and inches")
- marker
- scissors
- pencils **

Architect/Volunteer:

- Handout 1.1 (copies for each student)
- Handout 1.2 (copies for each student) **
- 2 large pieces of paper
  - 1- 30" x 7'-0" paper with adult silhouette drawn with marker
  - 1- blank 30" x 7'-0" paper
- marker
- pipe cleaners

** optional

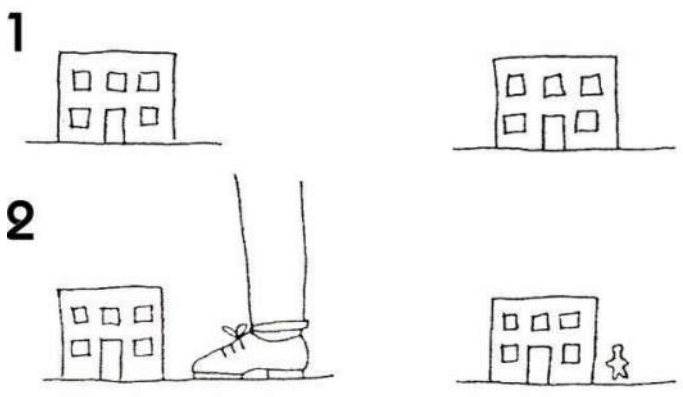
INTRODUCTION *(5 MINUTES)*

Introduce yourselves and give a brief description of Box City. Explain that they'll be learning about architecture and creating their own model cities. Their city will be joined with other classes' cities and displayed for the public. It might be helpful to show a few pictures of previous year's cities. Instruct the students that they will need to bring in boxes (cereal, oatmeal, juice boxes, etc.) in anticipation of building the Box City.

LESSON ACTIVITY 1 - HOW BIG IS THIS BUILDING? *(15 MINUTES)*

Invite the class to sit on the floor. Ask one student to stand up against a large piece of paper tacked to the wall. Trace a silhouette of his/her body. Compare the silhouette to that of an adult tacked up next to the child's. Measure how many "hands high" the silhouette is using the child's hand. Then measure the adult silhouette using the child's hand. Repeat the measurements using "feet and inches". Compare and discuss.

Have the students return to their own desk. Draw on the blackboard a simple picture of two buildings. (Image 1) Ask students, "How big are these two buildings?" Expect some disagreement and confused guesses. Then add to these drawings. (Image 2) "Now how big are these buildings?" Discuss the difference between size and scale. (Size is the physical dimension. Scale is something's size in relation to other things and requires context, similar to proportion.)



BOX CITY ACTIVITY - PIPE CLEANER PERSON *(20 MINUTES)*

The pipe cleaner person is applicable in all lessons as a reminder of scale. (Box City buildings, roads, maps, etc will all be at ¼" = 1'-0" scale)

Give students a copy of **Handout 1.1**. Have students complete the handout, drawing a figure and tree in scale with each image. It is useful to ask repeatedly, "Does it fit?" ("Could a person fit inside the door?") Discuss the idea of context, and how an object's context affects its scale.

Give each student one pipe cleaner and have them twist and cut their pipe cleaner to resemble a human figure in scale with image #2. If the class has talked about ratios, you might explain how to find the height of our pipe cleaner person with fractions and multiplication using the scale (ratio) of 1/4" = 1'-0" (at 1/4" = 12", a 6'-0" or 72" person would be 1 1/2", so their pipe cleaner person should be approximately 1 3/8"-1 5/8" tall).

Pro Tip: *You will likely need a way to store the pipe cleaner people e.g. in student cubbies, zip lock bags with student's name on them etc. Teachers and volunteers will need to coordinate.*

ACTIVITY 2 (OPTIONAL) - CHILD SCALE/ADULT SCALE *(15 MINUTES)*

Compare the size of a student's desk and chair to the student, and then compare the desk and chair to an adult. Compare the teacher's chair to the student. Ask them if they feel comfortable sitting in the chair. Discuss the relative size of furniture to an adult and a student.

Discuss the relative scale of doors and windows to an adult and then to a child. Stress the idea that a door must be tall enough to walk through, and a window must be high enough to look through. Ask the students how far the window sill comes up to them when they look out of a window.

Give students **Handout 1.2.** Have each student measure each object using their own hand, metric, and imperial units, and write the results on their handout. You might consider doing one object together first. Have the children discuss or explain their results.

RESOURCES

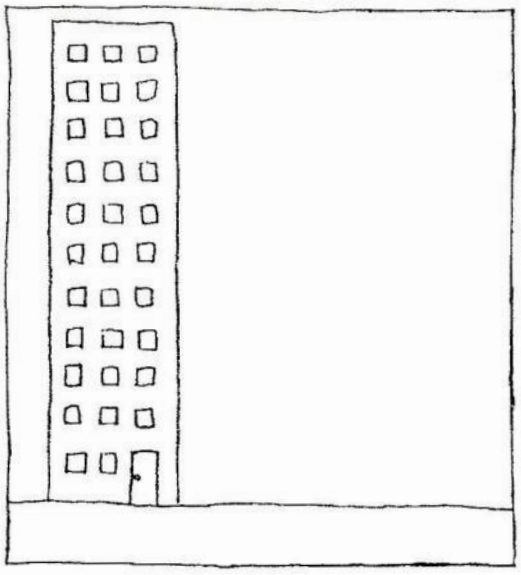
Architecture in Education: A Resource of Imaginative Ideas and Tested Activities
Foundation for Architecture, Philadelphia; Edited by Marcy Abhau with Rolaine Copeland and Greta Greenberger

HANDOUT 1.1

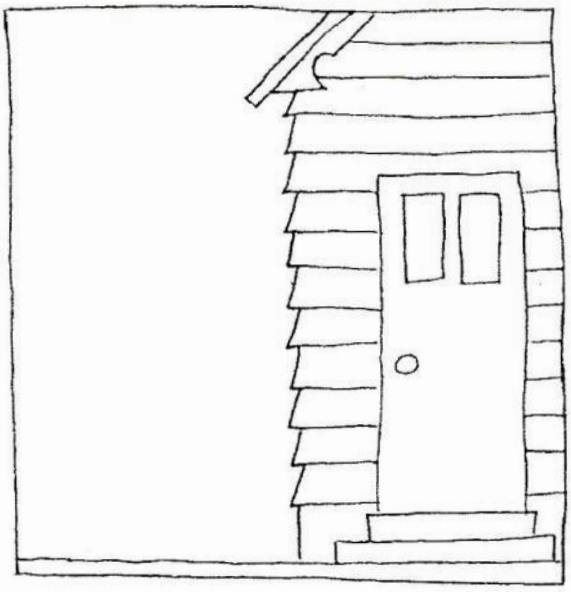
INSTRUCTIONS

1. Create a pipe cleaner person that would fit through the door of image #2.
2. Draw a figure (person) in scale with each image.
3. Draw a tree in scale with each image.

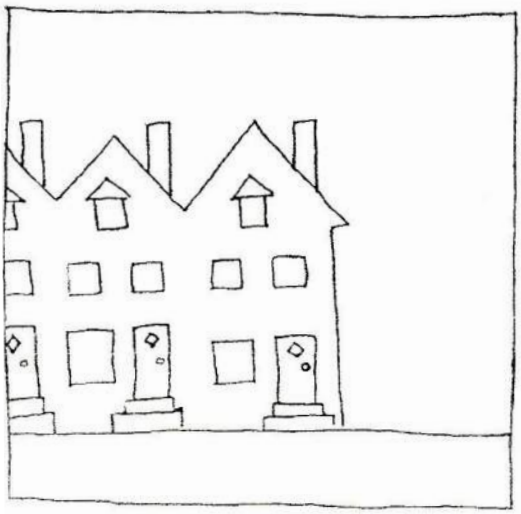
1.



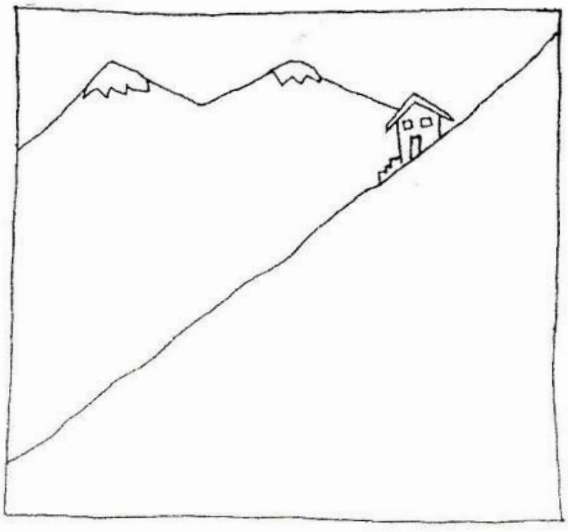
2.



3.



4.



HANDOUT 1.2

INSTRUCTIONS

Find the following objects in your classroom. Measure the objects listed using your hand, metric and "feet and inches". Write your answers in the blanks.

Student's Chair

	Height	Width	Depth
Hand			
Metric (cm)			
Feet and Inches			

Student's Desk

	Height	Width	Depth
Hand			
Metric (cm)			
Feet and Inches			

Teacher's Chair

	Height	Width	Depth
Hand			
Metric (cm)			
Feet and Inches			

Teacher's Desk

	Height	Width	Depth
Hand			
Metric (cm)			
Feet and Inches			