LARGE SCALE

5th Grade
Math and Visual Art

Math Objectives:
1. TSW calculate ratio to determine how to increase the size of an everyday object.
2. TSW apply calculations to determine the length and width of the large scale object.
3. TSW use graph paper and a ruler to create a scale model of the object.

Visual Art Objectives:
1. TSW draw a scale model of an everyday object on graph paper.
2. TSW create a realistic drawing of an everyday object in large scale on drawing paper.
3. TSW complete the drawing using shading techniques to give the effect of realism.

Standards/Benchmarks

MATH – Common Core
- 5-NF-3   Interpret a fraction as a division of the numerator by the denominator (a/b = a ÷ b involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
- 5-NF-4 Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
- 5-NF-6   Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

VISUAL ART – Louisiana Standards
Creative Expression:
- Identify imagery and create visual representations
- Explore and discuss techniques
- Identify relationships among visual arts, other disciplines, and disciplines outside the arts

Aesthetic Perception:
- Identify how and why the visual arts are used in daily life

Critical Analysis:
- State feelings and interpretations about a composition

Vocabulary: ratio, scale, length, width, shading

LESSON SUMMARY

Students will be introduced to large scale sculpture by Claes Oldenburg and Cooje van Bruggen and consider how an artist creates a realistic replica of an object in large scale. Students will calculate ratios to create a model of an object of their choice. Students will then turn their scale drawing into a completed work of art in colored pencil.

DAY 1: Review fractions and introduce ratios **(45 min)**

ANTICIPATORY SET: (5 min)

TTW hold up a toy car and ask students if they know what it is. TSW discuss the size of the car and examine the details. TTW ask questions such as

- Do the tires look like the right size to you?
- Do you think this toy car is exactly like a real car only smaller?
- How do you think the toy company knew how to make it so small?

TTW show the class a reproduction of *Corridor Pin, Blue* by Oldenburg and van Bruggen as well as an actual safety pin and ask questions such as

- Does this pin look like this one?
- How do you think the artists knew how to make their sculpture so big?

TTW tell students that artists and toy makers use RATIO to calculate SCALE so that they can make replicas in exact proportion.

PROCEDURES: (15 min)

TTW review fractions ½, ¼, 1/3, 1/6, 1/8 reminding students that fractions are parts of a whole number. If students need practice with fractions, use manipulatives such as colored beads or candy (M&M's, Skittles) to create fractions and reduce. If students have mastered fractions, move on to ratios. Ratios are a comparison of how much there is of one thing to another. Ratios can compare part to part or part to whole. Ratios are written in three ways.

Ratios can express part to part
        Ex. There are 20 students and one teacher = 20:1 or 20/1 or 20 to 1
        Ex. There are 12 boys and 8 girls in the class = 12:8 or 12/8 or 12 to 8

Ratios can express part to whole
        Ex. There are 12 boys and 8 girls in the class = 12:20 or 12/20 or 12 to 20
        Ex. There are 12 boys and 8 girls in the class = 8:20 or 8/20 or 8 to 20

GUIDED PRACTICE: (5 min)

TTW ask students to express ratios that relate to the classroom (girls to boys, chairs to tables, doors to windows, etc.) TSW work in small groups or pairs to express at least three ratios.

TSW remain in groups and TTW explain that ratios can be used to scale up or down by multiplying or dividing. TTW demonstrate by calculating the ratio of the class if the class size were to double but the ratio or boys to girls remained the same (multiply both by 2).

TTW remind the class of the Corridor Pin by Oldenburg and van Bruggen and tell the class the dimensions of the sculpture. TTW tell the class that they are not going to enlarge an object that much, but that they are going to calculate how to double, triple and quadruple the size of a common object.

INDEPENDENT PRACTICE: (15 min)

TSW choose 2 different everyday objects from a selection provided (see materials list). Students may remain in small groups or work individually. TSW create a chart to show the ratio of height and width when the objects are doubled, tripled and quadrupled in size.

	Object #1	Object #2
Height: width		
2 x		
3 x		
4 x		

TSW make measurements and record their calculations on the chart.

TSW select one object and draw a scale drawing of the object on a piece of graph paper. TSW then draw the object in a ratio of 2:1 on the piece of graph paper.

CLOSURE: (5 min)

TTW ask students if their large scale drawing looks like the actual item. Are the proportions correct? Could you build a sculpture from it? TTW ask a volunteer to show their work on the board and hold up their drawing for the class.

DAY 2: Complete a realistic drawing on a larger than life scale

ANTICIPATORY SET:

TTW remind students that they have been learning about scale and show the *Corridor Pin, Blue* again. TTW tell students about the work of artist Claes Oldenburg and the early "soft sculptures" that he completed by creating large scale replicas of common objects and food out of material. TT may show other works of art by Photorealists, Oldenberg or Andy Warhol (ex. Brillo boxes, Cambell's Soup cans). TTW explain that these artist made the mundane monumental by increasing the scale and taking a close look at commonplace things.

PROCEDURES:
TSW take out their chart from the previous lesson and choose one of the two objects from which to create a colored pencil drawing. Students can use rulers or other measurement tools to complete the work. TTW tell students that they should strive for a realistic interpretation of the object and remind them to make careful observations as to where the light and shadows fall.

GUIDED PRACTICE:
TSW draw lightly in pencil to indicate the general size of the object. Students may scale the object 3 to 4 times (the width and height should be indicated on their chart). TTW demonstrate making the measurements on the drawing paper and move through the class to assist students.

INDEPENDENT PRACTICE:
TSW continue to make initial sketches and TTW assist students as needed. When students are nearing completion of the sketch, TTW remind students to use shading, cross hatching or stippling to give the appearance of depth. If necessary, a mini-lesson can be offered. TSW continue to work on the drawing adding color using colored pencils.

CLOSURE:
When all work is complete, TSW display the drawing on his or her desk and the class will take a "gallery walk," walking around the classroom to see works by other students. TTW ask if any students would like to comment on his or her own drawing. TTW ask "What is a ratio?" "How do we calculate scale?" "Why would we need to know how to calculate scale?" "What are some other instances when you have used scale?"

MATERIALS
Image of Oldenburg and van Bruggen's *Safety Pin*
Everyday objects or toys (marbles, dominos, jacks, toothbrush, safety pin, pencil, paper clip, scissors, stapler, binder clip, etc.)
Ruler
Graph paper
Pencil
Drawing paper
Colored pencils

ASSESSMENT
Following directions
Working during work time
Math calculations
Scale drawing
Completed drawing—design, shading, scale

ACCOMODATIONS
Students may move around the room
Students may work in pairs
Students may use calculators and/or rulers