Using Ratios and Scale with House Plans (Review Unit)

Sequence of Activities:

Day 1

Pre-Assessment Introduction to ratios and ratio expressions Writing ratios in simplest form Using rates and proportions to solve for an unknown value.

Day 2

In teams, create a scale drawing of an assigned area.

Day 3

Explore home plans at <u>http://www.houseplans.com</u> Students will select a single story home and determine the scale of the drawing. Begin development of their plan ideas.

Day 4

Students will use <u>http://www.gliffy.com</u> to draw their house, bookcase or other construction trades related item to scale.

Assessments: Pre-Assessment:

You have determined the following ratios. Find the unknown value.

1.
$$\frac{.25}{1} = \frac{7}{n}$$
 2. $\frac{.25}{4} = \frac{7}{n}$ 3. $\frac{1.25}{n} = \frac{5}{24}$

- 4. A garage measures 2 inches on the blueprint and is 26 feet wide. What is the scale?
- 5. Use the following simple house plan to determine the actual dimensions of the kitchen? Note the following drawing has been resized to fit in the lesson plan.



Scale Drawings

Ratios, Rates & Proportions Practice

1. Find the ratio, as a fraction in simplest form, of the number of board feet of cedar to board feet of ash.

Board Feet of Wood at a Lumber Store			
Pine	Ash	Oak	Cedar
20,000	18,000	10,000	12,000

2. The cost of building a patio cover was \$250 for labor and \$350 for materials. What is the ratio, as a fraction in simplest form, of the cost of materials to the total cost of the project?

3. A decorator bought one box of ceramic floor tile for \$21 and a box of wood flooring for \$33. What is the ratio of wood flooring cost to the total cost?

4. A painter estimates that 5 gallons of paint will cover 1200 ft² of wall service. How many gallons are required to cover 1680 ft²?

5. The lighting for a billboard is provided by solar energy. If three panels generate 10 watts of power, how many panels are needed to provide 600 watts of power?

6. The length of a living room is 16 feet and the width is 12 feet. Find the ratio of length to width in simplest terms.

7. The current (A) in an electric circuit is inversely proportional to the resistance (R) in the circuit. When the resistance is 3 ohms, the current is 2 amperes. Find the resistance if the current is 5 amperes.

8. To conserve energy and still allow for as much natural light as possible, an architect suggests that the ratio of the area of a window to the area of the total wall surface be 5:12. Using this ratio, determine the recommended area of a new window to be installed in a wall that measures 8 feet by 12 feet.

9. An air conditioning specialist recommends 2 air vents for every 300 ft² of floor space. At this rate, how many air vents are required for an office building of 21,000 ft²?

10. The scale on a building plan is 1 inch to 3 feet. Find the length and width of a room that measures 5 inches by 8 inches on the drawing.

11. Solve.
a.
$$\frac{n}{11} = \frac{32}{4}$$
 b. $\frac{18}{11} = \frac{16}{n}$

c.
$$\frac{n}{21} = \frac{-15}{7}$$
 d. $\frac{5}{12} = \frac{60}{w}$

12. If y varies **inversely** as x, and y = 8 when x = 2, find y when x = 4.

13. If t varies inversely as q and t = 240 when q = 0.01, then find the value of t when q = 8.

14. The time to complete a project is inversely proportional to number of people who are working on the project. The remodeling project can be completed by 5 workers in 24 days. In order to finish the project sooner, the company plans to hire additional workers. How many workers are needed to finish the project in 15 days?

15. If w is directly proportional to m and w = 42 when m = 6, then find the value of m when w = 140

Create a scale drawing of your assigned area.

Instructions: Work together as a team to accurately measure your designated area. Once you have all the measurements, including placement of windows and doors return to class and create a scale drawing using $\frac{1}{4}$ " to 4'. Hint: As you're taking measurements sketch the area below, it will serve as your notes for the scale drawing.

- Group 1: Measure & Draw to scale the Math Room
- Group 2: Measure & Draw to scale the REMC Teacher Work Room
- Group 3: Measure & Draw to scale Main Entrance Area by the Front Office
- Group 4: Measure & Draw to scale the Commons Area

Group 5: Measure & Draw to scale the hall from the Math Room down to the Main Entrance Area