



MEASUREMENT

Teacher Notes



FOURTH GRADE BACKGROUND

- Little experience with measurement tools (they don't know how to use rulers).
- Fourth grade curriculum states they should be able to measure to 1/4-inch. Unfortunately, they do not know fractions at this point, so we should stick to whole number or 1/2-inch measurements.
- Students will have problems starting at 0. Check to see that they are measuring length correctly!
- Students have studied perimeter and area in math, but it is foreign to talk about these concepts in science. They can multiply to find area and add to find perimeter, but 4th graders easily confuse these.
- Students will use both inches and centimeters, but should not be expected to convert between units.

PREVIOUS LESSON REVIEW

- What did you learn last month about mass? What are the steps of the scientific method?

INTRODUCTION

The focus of this unit is to give the students experience with making length and area measurements. There are many tools used to make measurements, and the right tool must be used for each job. For example, a ruler would not be used to measure the temperature of the outside air. Measurements not only include a number, but also a unit. It would be unclear if someone told you that they were 5 tall, however 5 feet tall makes much more sense because you know what unit is being used to make the measurement.

The concepts of perimeter and area should be discussed. A good way to describe these vocabulary words is through an analogy with a back yard. The fence is the perimeter because it outlines the backyard. The space within the fence is the area of the back yard. Have students trace the perimeter of their desks and wave their hands over the area of the desktop. This tracing and hand waving of the perimeter and area can be done for the shapes that they will be dealing with in an attempt to instill these concepts into the students' minds. Use the large poster and transparencies to review perimeter and area before starting the activities.

DISCUSSION THOUGHTS

What are some tools that we use to measure things? What do these tools measure?

VOCABULARY

- **Perimeter:** The distance around an object (measure in units of length)
- **Area:** The space within an object's outline (measure in units of length squared)
- **Ruler:** A measurement tool used to determine length or distance
- **Measurement:** The numerical value of an object's property. Measurements have a number and a unit.

ACTIVITIES

- **Triangle and Square Measurement Extravaganza**
 - Students are given a set of white squares and triangles and are asked to measure the length of the sides of each shape. These measurements are used to calculate the perimeter of the square and triangle and the area of the square. The areas can be estimated by putting a piece of transparency paper (divided into square centimeter units) over the object and counting how many square centimeter blocks cover the shape. They are very familiar with counting squares from math. The students should also use multiplication to calculate the area (demonstrate this first).
 - Objective: Students learn how to measure a distance and then calculate area and perimeter.
 - Materials:
 - 30 wooden squares
 - 30 wooden triangles
 - 30 transparencies marked in square centimeters

- **Perimeter Shape-Up**
 - Each student is given one brightly colored shape (circle, hexagon, square, or triangle). They are asked to estimate which shape has the greatest perimeter. Students measure the shapes in inches. Afterwards, survey the class to determine the true perimeter of each shape. For those with circles, let them ask for a piece of string. All of the shapes have the same perimeter.
 - Objective: Students practice measuring perimeters and are exposed to making estimations.
 - Materials:
 - 30 wooden shapes (yellow triangles, black circles, green squares, and red hexagons)
 - 10 pieces of string

- **Worksheets**
 - Students complete the measurement worksheet. You can use the overhead to work together. Students can measure the shapes on the back of the worksheet at home.
 - Materials:
 - 25 Measurement Worksheets

- **Flip This House**
 - Break students into groups of three or four. Student A is the flooring and roofing specialist. Student B is the window expert. Student C is a painter. Student D is the groundskeeper. Hand out one task card to each group. Students must complete the measurement on the task card and then “buy” the right amount of material at the store from one of the volunteers. Even though each task has a specialist, students should consult with one another before “buying” materials from you. Follow the worksheet and go through each task, rotating which specialist is needed. Groups can move on to the next renovation task once they have successfully completed the measurement (with unit).
 - Objective: Students explore the practical applications of measuring.
 - Materials:
 - 5 bases, houses, and roofs
 - 25 rulers
 - 25 Measurement Experiment Worksheets

CONCLUDING THOUGHT

You need to use the right tool to make a correct measurement. Thinking about a swimming pool: what tool would you use, how would you use it, and what units would you use to measure the following? Temperature of the water? Distance/Perimeter of pool fence? Area of the solar cover? Weight of water soaked up in your used beach towel? Volume of lemonade you drank by the pool?