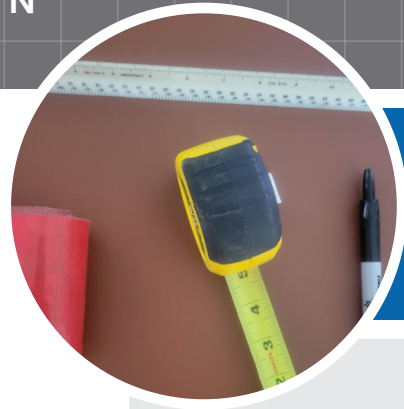


Comparing Measurements

LESSON PLAN

Comparing Measurements



GRADE LEVEL:

3-5,
6-8

OBJECTIVE:

Participants will learn to use different tools to measure distance and the varying degrees of accuracy.

INTRODUCTION:

Surveyors measure the land around them. This demonstration shows the different tools people use to take measurements.

Before you begin, place two strips of tape on the ground to measure out 10 feet in length to help with the 'pacing' portion of this demonstration.

Next, pick out the area that you will have the participants measure. This could be the length of a classroom, the distance of a hallway, or an area outside (I.E., baseball field). Plant a starting point and an end point. The length can be adjusted depending on the age level of the participants.

INSTRUCTIONS:

Ask the participants how often they take measurements. Why is it important to measure things? The height of buildings, distance from classroom A to classroom B, the square footage of a piece of property, etc. What kind of tools can you use to measure distance or length?

CHALLENGE:

Test a variety of measuring methods to find out which is the most accurate.

MATERIALS NEEDED PER GROUP:

- Tape measure
- Ruler
- Yardstick
- Tape

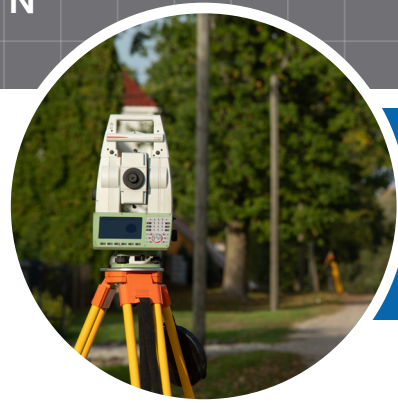
ADDITIONAL MATERIAL:

- (Optional:) Total station or other surveying instrument



Comparing Measurements

LESSON PLAN



**GRADE
LEVEL:**

3–5,
6–8

INSTRUCTIONS CONTINUED:

Depending on the time you have, you may first want to talk about surveying. Ask the participants if they know what a surveyor does. Go on to detail the scale of measurements and data that surveyors collect.

Point out the starting marker and end marker that you have set before the activity. Ask students to use their eyes to guess the distance between the two markers. Pick the most supported answer.

Ask the participants if they know what pacing is. If not, go on to explain and show them how to use their footsteps for measurement using the pacing tape you've set on the ground before the activity.

Ask for a volunteer to measure the distance between the markers using pacing or demonstrate yourself.

How close was the pacing number compared to the original guess?

After some discussion, bring out a 12-inch ruler. Inquire if it is an accurate tool for measurement. Ask a volunteer or two to measure the distance between the markers using just a single ruler.

Write down the new number. Compare the ruler length, the pacing length, and the eyeball length. Discuss the accuracy.

Next, bring out the tape measure. It's probably the most common form of measurement in most households. Why is that? Ask for another volunteer to hold the tape measure and measure the distance between the two markers.

Discuss the new length and compare to old measurements.

Optionally, use a surveying instrument (total station or other) to measure the distance between the two markers.

Discuss the importance of accuracy when it comes to public safety.

TALKING POINT:

A total station is a surveying instrument that uses electronic distance measurement (EDM) to measure distance and angles. Total stations are an extremely accurate tool for measuring distance. Most total stations can measure distances of up to 1.5 kilometers with an accuracy of 1.5 millimeters.