Inclinometer Construction Guide

Purpose: This guide explains how to build a simple inclinometer using classroom materials. The inclinometer allows you to measure angles of elevation, which can be used to calculate the height of tall objects using trigonometry.

Materials Needed:

- 1 plastic protractor
- 1 plastic straw (cut in half)
- 1 piece of string (approx. 30 cm)
- 1 small weight (washer or metal nut)
- Tape or glue
- Scissors (to cut straw/string)
- Optional: Ruler and smartphone (for testing accuracy)

Step-by-Step Instructions:

1. **Attach the straw:** Tape the straw along the flat edge of the protractor, centering it across the straight side. This will serve as your sight tube.
2. **Add the string:** Tie one end of the string through the hole at the protractor's center point (usually at the 90° mark on the curve).
3. **Add a weight:** Tie the washer/nut to the free end of the string to act as a plumb line.
4. **Test it:** Hold the inclinometer and tilt it while looking through the straw at the top of a tall object. Let the string hang down freely.
5. **Read the angle:** Where the string crosses the protractor's degree markings is your angle of elevation.
6. **Use math to calculate height:** If you're standing a known distance (in meters) from the object's base, you can calculate its height with: height = tan(angle) × distance

Tips for Students:

- Decorate your inclinometer using ancient geometry symbols (e.g., Egyptian, Mayan, Greek patterns).
- Always measure from eye-level; if needed, add your eye-level height to the final result.
- Test the inclinometer by measuring objects of known height.

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