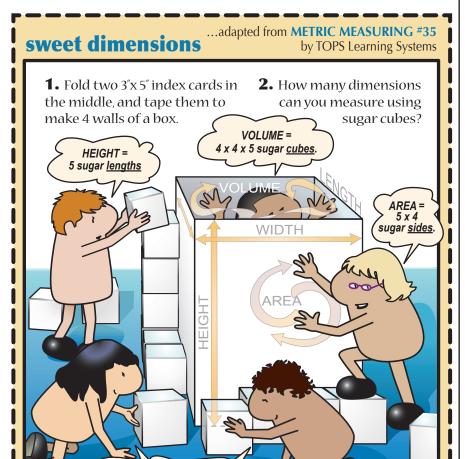
Another FREE SAMPLE LAB from TOPS LEARNING SYSTEMS!

This **TOPS** Idea is taken from an original series of black-and-white line masters, adapted to stand alone as an independent mini-lesson. Please purchase our original book to get the whole in-depth program.



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OBJECTIVE

To measure a box in 1, 2, and 3 dimensions. To calculate area and volume by multiplying lengths.

LENGTH = WIDTH = 4 sugar lengths

LAB NOTES

Introduction: Ask students to identify each dimension below as YOU act it out. Then call out dimensions for THEM to act out.

1-dimension = Width, Length, Height or Depth: Pantomime stretching out invisible string.

2-dimensions = Area: Pantomime wiping an invisible, flat surface.

3-dimensions = Volume: Move hands in all three directions to occupy 3-D space.

Step 1. Fold the cards evenly in half. Match and secure edges with tape. Prop open into a "box."

Step 3. All dimensions come out about even. Students can stack sugar cubes to find answers, or multiply the sides to find area and volume.

EVALUATION

Trim paper to 25.6 cm by 19.2 cm. Ask your students to find its area. (192 sugar squares). Also find folded areas for $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$!

ANSWERS

2. height or depth = 5 sugar "lengths" length or width = 4 sugar "lengths" area of any side = 20 sugar "squares" area of top or bottom = 16 sugar "squares" volume of box = 80 sugar "cubes"

EXTENSION

Measure a paper grocery bag in sugar cubes. Round lengths up or down to whole sugar edges. Results for a paper bag we measured:

length = 19 sugar lengths width = 11 sugar edges

bottom area = $19 \times 11 = 209$ sugar squares height = 27 sugar edges

side areas = $19 \times 27 = 513$ sugar squares, and = $11 \times 27 = 297$ sugar squares

$volume = 209 \times 27 = 5,643 \text{ sugar cubes}$ **MATERIALS**

- Two 3x5 inch index cards and clear tape.
- Sugar cubes (not bricks). Use C&H or equivalent one-teaspoon cubes, measuring 5/8 inch (16mm) on each edge. If not available in your area, you can order from TOPS.

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02 MEASURING LENGTH (gr 6-10)

03 GRAPHING (gr 6-10)

04 BALANCING (gr 6-11)

05 WEIGHING (gr 5-10)

06 METRIC MEASURE (gr 8-12)

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10 ANALYSIS (gr 5-10)

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14 KINETIC MODEL (gr 7-12)

15 HEAT (gr 8-12)

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