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CSI: MATHEMATICS
Curriculum Support Information

A mathematics resource for parents, teachers, and students

GEORGIA DEPARTMENT OF EDUCATION
Kathy Cox, State Superintendent of Schools

Super Solid Figures

Students will: **Fifth Grade 5 of 5**

- Describe three-dimensional figures by faces, edges, and vertices
- Determine formulas for finding the volume of cubes and other rectangular prisms
- Estimate and determine the volume of rectangular prisms
- Distinguish between volume and capacity
- Convert capacity measurements within a single system of measurement (customary, metric)

Classroom Cases:

1. Complete the conversions below:

a. 3 cups = _____ pts.
b. 2 qts. = _____ cups
c. 3 c. = _____ fl.oz.
d. 3 qts. =_____ pts.
e. ½ gal. = _____ cups
f. 40 fl. oz. = _____ pts

Case Closed - Evidence:

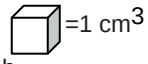
a. 3 cups = 1 ½ pts.
b. 2 qts. = 8 cups
c. 3 c. = 24 fl.oz.
d. 3 qts. = 6 pts.
e. ½ gal. = 8 cups
f. 40 fl. oz. = 2 ½ pts.

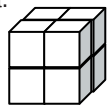
2. Jamie plans to serve each guest 300 mL of punch. If 12 guests are coming to the party, how many liters of punch will Jamie need?

Case Closed - Evidence:

12 guests will need 12 x 300 mL= 3600mL, and 3600 mL x 1L/1000mL= 3.6L
Jamie will need 3.6 L of punch. If punch is sold by the liter, she will have to buy four bottles.

3. For each of the figures below, identify the shape, state its dimensions, and determine the volume.



a.


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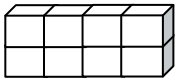
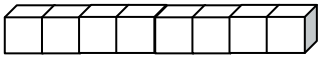


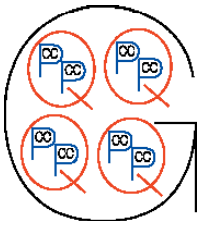
c.


Case Closed - Evidence:

a. This is a cube. Its dimensions are 2 cm x 2 cm x 2 cm and its volume is 8 cm^3.
b. This is a rectangular prism. Its dimensions are 4 cm x 1 cm x 2 cm and its volume is 8 cm^3.
c. This is a rectangular prism. Its dimensions are 8 cm x 1 cm x 1 cm and its volume is also 8 cm^3.

Clues:

- Faces are sometimes called “surfaces”.
- Vertices are sometimes called “points”.
- This graphic is a quick reference for cups, pints, quarts, and gallons.



Book ‘em:

Pigs in the Pantry, by Amy Axelrod
The Hershey’s Milk Chocolate Weights and Measures, by Jerry Pallotta

Further investigations:

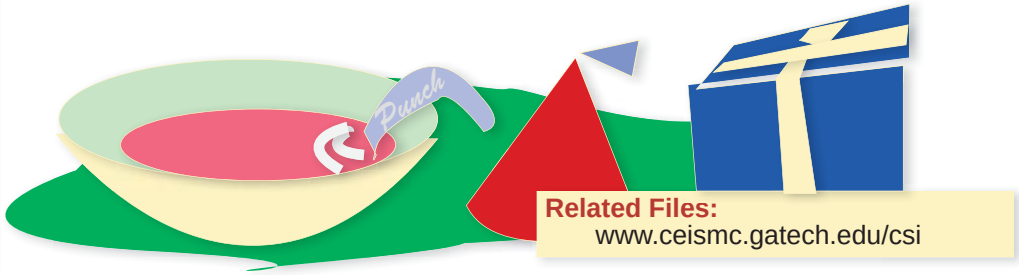
Challenge your child to find objects at home that have volumes of 1 cm^3, 1 m^3, 1 in^3, 1 ft^3, and 1 yd^3. See if your child can find at least two objects for each measurement.

Invite your child to the kitchen to see how many cups it takes to fill up a large container, such as a pitcher. How many ounces is this? How many pints is this? How many quarts is this? How many gallons is this? Encourage your child to create a chart to show his results.

Ask your child to explain how area and volume are alike and different.

Terminology:

Capacity: The amount a container can hold
Cube: A solid shape that has 6 square faces all equal in size, 8 vertices, and 12 equal edges
Cubic centimeter (cm^3): Metric unit for measuring volume; each dimension is measured in centimeters
Cubic meter (m^3): A metric unit for measuring volume; each dimension is measured in meters
Cubic foot (ft^3): Customary unit for measuring volume; each dimension is measured in feet
Cubic inch (in^3): Customary unit for measuring volume; each dimension is measured in inches
Cubic yard (yd^3): customary unit for measuring volume; each dimension is measured in yards
Cup (c.): Customary unit for measuring capacity (2 cups = 1 pint)
Edge: Where two surfaces of a three-dimensional shape intersect
Face: Flat surface of a three-dimensional shape
Fluid ounce (fl. oz.): Customary unit for measuring capacity = (8 fl. oz. = 1 pint)
Gallon (gal.): Customary unit for measuring capacity (4 quarts = 1 gallon)
Liter (L): Metric unit for measuring capacity (1L = 1000 mL)
Milliliter (mL): Metric unit for measuring capacity
Pint (pt.): Customary unit for measuring capacity (2 cups = 1 pint)
Quart (qt.): Customary unit for measuring capacity (2 pints = 1quart)
Rectangular prism: A 3-dimensional object with two identical, rectangular bases
Vertex: Point where faces of a 3-dimensional shape meet; also known as a “corner”
Volume: Amount of space occupied by an object



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