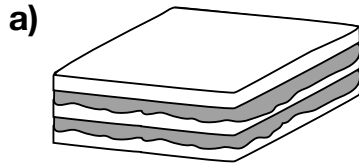# Stacking Shapes to Make Prisms
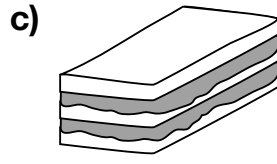
Goal   **Describe and name prisms.**

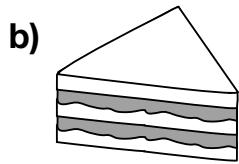**1.** Name the prism.
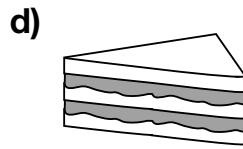
a)

square-based

prism
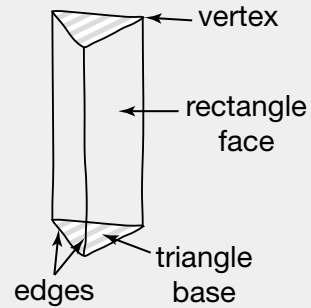
c)

rectangle-based

prism

b)

triangle-based

prism

d)

triangle-based

prism

At–Home Help

A **prism** is a 3-D shape with congruent ends called bases. The other faces are 4-sided.

vertex

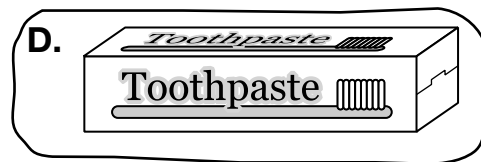rectangle face

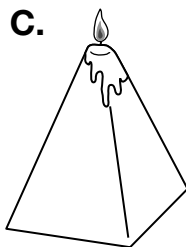triangle base

edges

triangle-based prism

2. Name the prism you could make with each base. Describe each prism by telling how many faces, edges, and vertices it has.

a)

rectangle-based

prism with 12 edges, 6 faces,

and 8 vertices

b)

pentagon-based prism

with 15 edges, 7 faces,

and 10 vertices

3. Circle the letter of the shape that is a prism.
Tell how you know that you have chosen the correct shape.

A. juice
1 serving

B.

C.

D. Toothpaste
Toothpaste
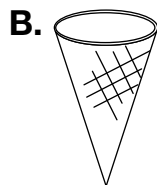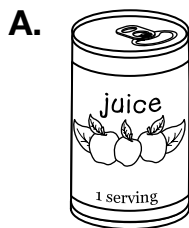
For example, D has 2 congruent bases and all the other faces have 4 sides.

2 Identifying Faces of Prisms and Pyramids

Goal **Compare and sort 3-D shapes.**

1. Name each shape. Use the names in the box.

A ____cube____

E ____rectangle-____
____based prism____

B ____triangle-____
____based prism____

F ____square-____
____based prism____

C ____square-____
____based pyramid____

G ____hexagon-____
____based pyramid____

D ____hexagon-____
____based prism____

H ____triangle-____
____based pyramid____

At–Home Help

A **pyramid** is a 3-D shape with 1 flat base. The other faces are triangles that meet at a vertex.

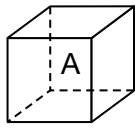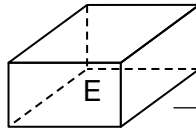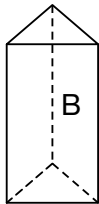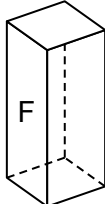**square-based pyramid**

Review the definition of prism in the At-Home Help on page 84.

> triangle-based prism
> square-based prism
> hexagon-based prism
> triangle-based pyramid
> square-based pyramid
> hexagon-based pyramid
> cube
> rectangle-based prism
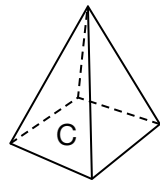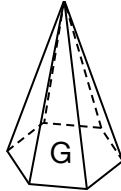
2. a) What do shapes B and H have in common? ____triangles for bases____

b) What do shapes C and G have in common? ____both pyramids and several triangle faces____

3. Write the letters of all the shapes that fit each description.

a) have at least 1 triangle face ____B, C, G, H____

b) base is square ____A, C, F____

c) all faces are triangles ____H____

d) all faces are rectangles or squares ____A, E, F____

Using Nets for Rectangle–Based Prisms

Goal **Build rectangle-based prisms from nets.**

You will need scissors, a ruler, and tape.

1. a) Trace this net.
Draw solid lines where there are solid lines.
Draw dashed lines where there are dashed lines.

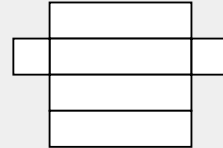**b)** Cut out the net along the solid lines.

c) Fold along the dashed lines.

d) Tape the edges.

e) Name the 3-D shape you built. _____ rectangle-based prism _____
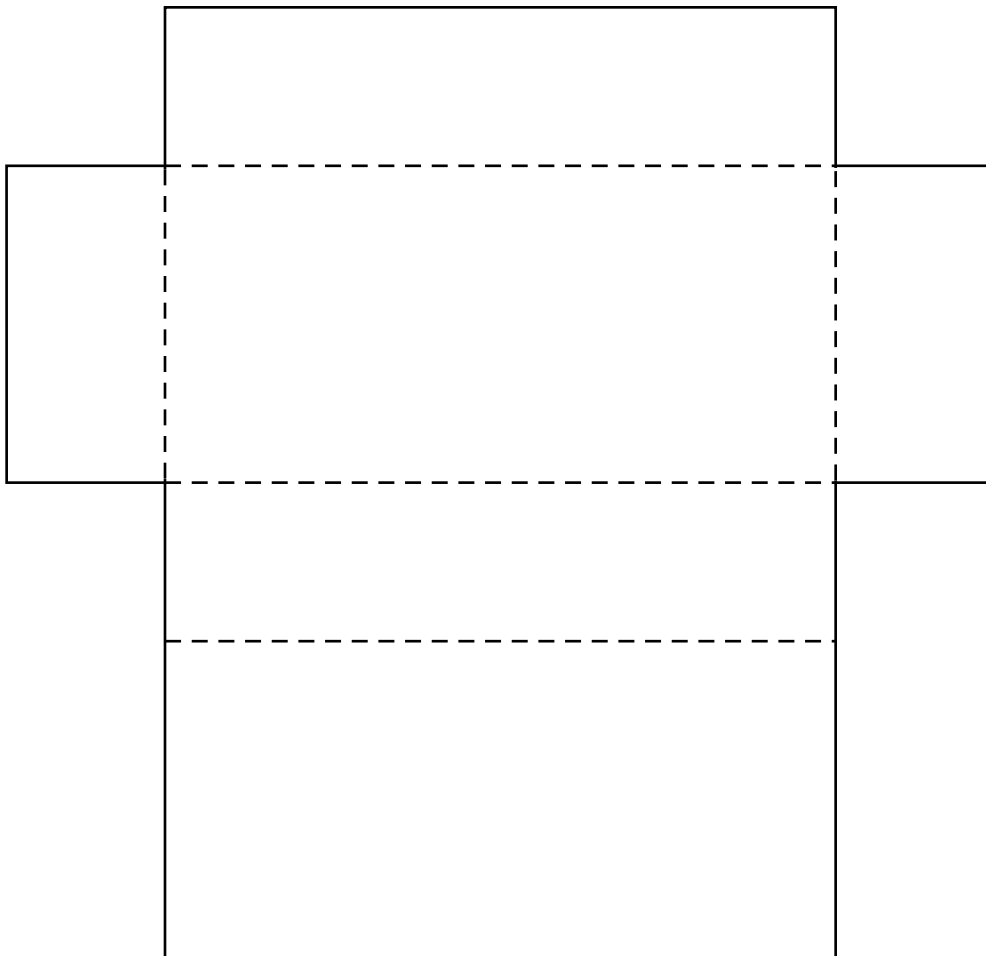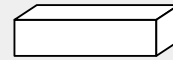
Building with 3-D Shapes

Goal **Build a structure with 3-D shapes.**

You will need boxes, cans, scissors, and tape.

1. a) Find 3-D shapes that you could
use to build a structure.

b) Plan a structure that you can build with
some of the 3-D shapes you found.

c) Build your structure. Use tape if necessary.

d) Sketch your structure on the right side of this page.

e) Describe your structure using math language.

Answers will vary.

f) Explain how you built your structure.

Answers will vary.

5 Estimating and Measuring Capacity

Goal **Estimate and measure the amounts containers can hold.**

You will need water, a measuring cup marked in millilitres and empty containers of different sizes.

1. Which unit would you use to measure the capacity of each container: litres or millilitres?

a) swimming pool ____litres____

b) pop can ____millilitres____

c) watering can ____litres____

d) spoon ____millilitres____

2. Find a measuring cup marked in millilitres.

How much does it hold? ____Answers will vary.____

3. a) Find 5 different sizes of empty containers such as bowls, glasses, and pots. Record the containers in the chart below.

b) Compare each container to your measuring cup and estimate the capacity of the container. Record your estimate in the chart below.

c) Check your estimates. Pour water from the measuring cup into each container to fill it. Keep track of how many measuring cups you use. Record your measurement.

> **At-Home Help**
>
> **Capacity** is the amount a container will hold.
>
> Capacity is measured in millilitres (mL) and litres (L).
>
> 1000 mL = 1 L

Container	My estimate	Measurement
cereal bowl	400 mL	500 mL
Answers will vary.		

6 Solve Problems About Combinations

Goal **Solve problems using a table to record combinations.**

Show your work.

1. Julia has 3 different ice cream scoops: 200 mL, 100 mL, and 50 mL.

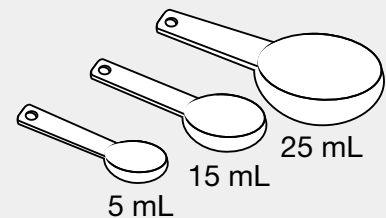   a) What possible amounts of ice cream can be measured without refilling the scoops?

Combination	Measure
1 scoop 200 mL	200 mL
1 scoop 100 mL	100 mL
1 scoop 50 mL	50 mL
2 scoops 200 mL + 100 mL	300 mL
2 scoops 200 mL + 50 mL	250 mL
2 scoops 100 mL + 50 mL	150 mL
3 scoops 200 mL + 100 mL + 50 mL	350 mL

Combination	Measure
spoon alone 5 mL	5 mL
spoon alone 15 mL	15 mL
spoon alone 25 mL	25 mL
2 spoons 5 mL + 15 mL	20 mL
2 spoons 5 mL + 25 mL	30 mL
2 spoons 15 mL + 25 mL	40 mL
3 spoons 5 mL + 15 mL + 25 mL	45 mL

   b) What possible sizes of ice-cream cones can be made if there are 2 scoops in each cone? You can refill scoops.

Combination	Measure
2 scoops same 200 mL + 200 mL	400 mL
2 scoops same 100 mL + 100 mL	200 mL
2 scoops same 50 mL + 50 mL	100 mL
2 scoops different 200 mL + 100 mL	300 mL
2 scoops different 200 mL + 50 mL	250 mL
2 scoops different 100 mL + 50 mL	150 mL

Answers Chapter 11: 3-D Geometry and 3-D Measurement   **89**

Estimating and Measuring Mass

Goal **Estimate and measure the masses of objects.**

1. Which would you use to measure the mass of each item: grams or kilograms?

a) a watermelon _____kilograms_____

b) a toothbrush _____grams_____

c) a bag of popcorn _____grams_____

d) a wagon _____kilograms_____

2. Find several full containers that are measured in grams or kilograms. Dry items, such as bar soap, cereal, bread, rice, nuts, and other snack foods usually have mass units. (The mass of the packaging is not included in the mass given.)

3. a) Find 5 objects of different sizes without any masses given. You can use, for example, a shoe, a book, a toy, a plate, a cushion, or a can of pop. Record the items in the chart below.

b) Compare each object to the items you found in Question 2 and estimate the mass of the object. Record your estimates in the chart below.

Item	My mass estimate
Dad's shoe	500 g
Answers will vary.	

> **At-Home Help**
>
> **Mass** is the amount of matter in an object. Mass can be measured in grams (g) or kilograms (kg).
> 1000 g = 1 kg

4. Take 1 or 2 of the objects from Question 3 to school tomorrow. Measure their masses to check your estimates.

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Test Yourself

Circle the correct answer.

1. Which prism could be made with this base?
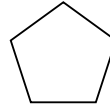
   A. rectangle-based prism   **C.** square-based prism

   B. pentagon-based prism   **D.** triangle-based prism

2. Which statement is **not** true about prisms?

   E. Prisms are named from the shape of their bases.

   F. The bases are always congruent.

   G. The faces that are not bases are all different.

   H. Prisms can be made by stacking the same shape.

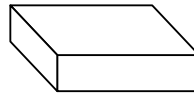3. What is true about all pyramids?

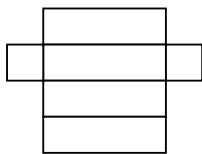   **A.** They have some triangle faces.   **C.** They have exactly 1 vertex.

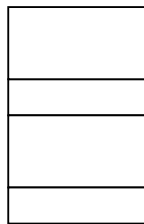   **B.** They have more than 5 faces.   **D.** They have 1 square base.
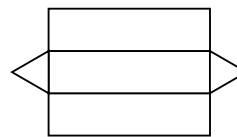
4. Which net would build this shape?

   E.   **F.**   **G.**   **H.**
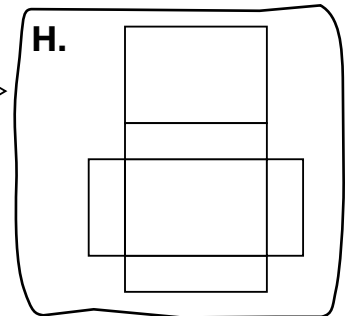
5. Which capacity best describes a small juice box?

   A. 200 L   **B.** 200 mL   **C.** 2 L   **D.** 2 mL

6. There are 3 sizes of pails: 1 L, 2 L, and 5 L. Which is **not** a possible amount that can be carried in 2 pails of different sizes?

   E. 8 L   **F.** 7 L   **G.** 6 L   **H.** 3 L

7. Which mass is the most reasonable for a textbook?

   A. 20 kg   **B.** 30 g   **C.** 2 kg   **D.** 200 g