Date Time

LESSON 11•3

Construction of Polyhedrons

Polyhedrons are geometric solids with flat surfaces formed by polygons.

For each problem below—

- Decide what the polyhedron should look like.
- Use straws and twist-ties to model the polyhedron.
- Answer the questions about the polyhedron.

Look at page 102 of the *Student Reference Book* if you need help with the name.

1. I am a polyhedron.
I have 5 faces.
Four of my faces are formed by triangles.
One of my faces is a square.

a. After you make me, draw a picture of me in the space to the right.

b. What am I? _____

c. How many corners (vertices) do I have? _____

d. What shape is my base? _____

2. I am a polyhedron.
I have 4 faces.
All of my faces are formed by equilateral triangles.
All of my faces are the same size.

a. After you make me, draw a picture of me in the space to the right.

b. What am I? _____

c. How many corners (vertices) do I have? _____

d. What shape is my base? _____

Date Time

LESSON 11·3

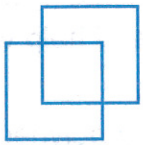
Drawing a Cube

Knowing how to draw is a useful skill in mathematics. Here are a few ways to draw a cube. Try each way. Tape your best work at the bottom of page 295.

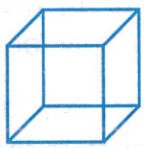
A Basic Cube

Draw a square.

Draw another square that overlaps your first square.
The second square should be the same size as the first.



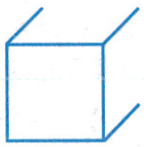
Connect the corners of your 2 squares as shown.
This picture does not look much like a real cube. One problem is that the picture shows all 12 edges, even though not all the edges of a real cube can be seen at one time. Another problem is that it is hard to tell which face of the cube is in front.



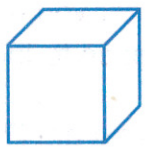
A Better Cube

Begin with a square.

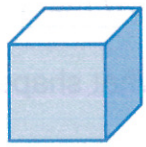
Next, draw 3 parallel line segments going right and up from 3 corners of your square. The segments should all be the same length.



Finally, connect the ends of the 3 line segments.



This cube is better than before, but it shows only the edges and corners, not the faces. If you want, try shading your cube to make it look more realistic.



Date Time

LESSON 11•3

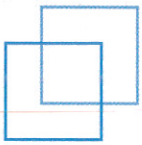
Drawing a Cube *continued*

A Cube with Hidden Edges

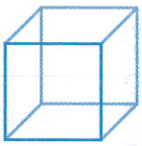
Sometimes people draw cubes and other shapes with dashed line segments. The dashed line segments show edges that are hidden. Here is one way to draw a cube with hidden edges. Use a pencil.

Draw a square.

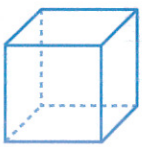
Draw a faint square that overlaps your first square.
The second square should be the same size as the first.



Connect the corners of your 2 squares with faint line segments.



Trace over 5 of your faint line segments with solid lines and 3 with dashed lines. The dashed line segments show the 3 edges that are hidden.



Tape your best work here.

Date Time

LESSON 11•3

Designing a Bookcase

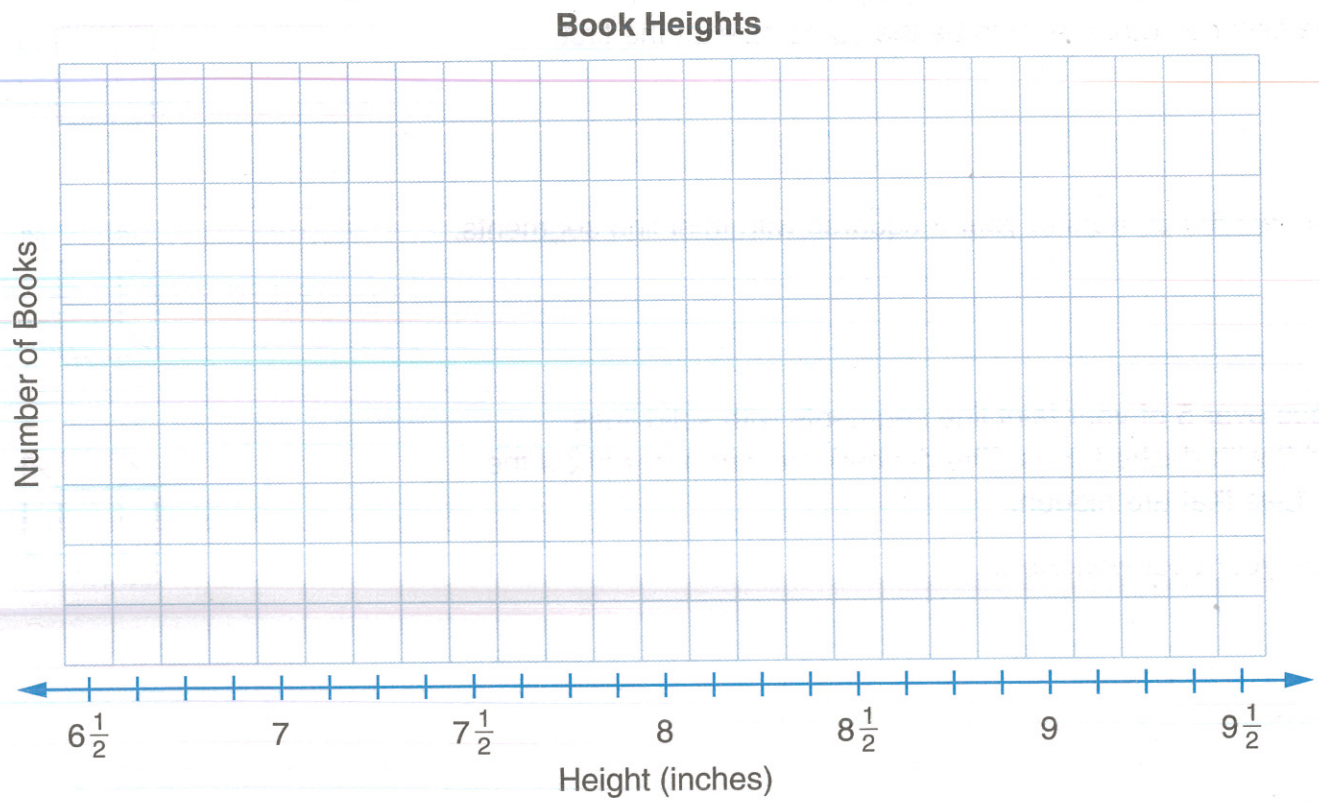
Stephen wants to build a bookcase for his books. To help him design the bookcase, he measured the height of each of his books. He rounded each measurement to the nearest $\frac{1}{8}$ of an inch. His measurements are given below.

Book Heights (to the nearest $\frac{1}{8}$ inch)

$6\frac{1}{2}, 9\frac{1}{4}, 7\frac{1}{8}, 7\frac{1}{2}, 8, 6\frac{7}{8}, 9\frac{1}{4}, 9\frac{1}{4}, 9\frac{1}{4}, 9\frac{1}{4}, 9\frac{1}{4}, 8\frac{1}{4}, 8, 8\frac{1}{4}, 8\frac{3}{8},$

$6\frac{1}{2}, 7\frac{1}{8}, 9, 6\frac{7}{8}, 9\frac{3}{8}, 6\frac{7}{8}, 7\frac{1}{2}, 8, 8\frac{1}{4}, 9\frac{1}{4}, 6\frac{7}{8}, 6\frac{7}{8}, 8\frac{1}{4}, 8\frac{1}{4}, 8\frac{1}{4}$

Plot the data set on the line plot below.



Use the completed plot to answer the questions below and on journal page 295B. Write a number model to show how you solved each problem.

1. a. What is the maximum book height? _____ inches

b. What is the minimum book height? _____ inches

c. What is the range of the data set? _____ inches

Number model: _____

Date Time

LESSON 11•3

Designing a Bookcase *continued*

SRB 55

2. a. What is the median of the data set? _____ inches

b. How much longer is the maximum height than the median height?

_____ inches Number model: _____

3. Suppose that Stephen wants to make the space between the shelves on his bookcase $\frac{7}{8}$ of an inch taller than his tallest book.

a. How far apart should he make the shelves?

_____ inches apart Number model: _____

b. If the thickness of the wood he uses for the shelves is $\frac{5}{8}$ inch, what will be the total height of each shelf? (*Hint:* The total height is the thickness of the wood plus the distance between shelves.)

_____ inches Number model: _____

4. Stephen decides to make the bookshelf two shelves high. He will put all the books that are 8 inches tall or shorter on the top shelf and all the books that are more than 8 inches tall on the bottom shelf.

a. What will be the difference in height between the tallest books on the top shelf and the shortest books on the top shelf?

_____ inches Number model: _____

b. What will be the difference in height between the tallest book on the bottom shelf and the shortest books on the bottom shelf?

_____ inches Number model: _____

5. Make up and solve your own problem about the book height data.

_____

_____

_____

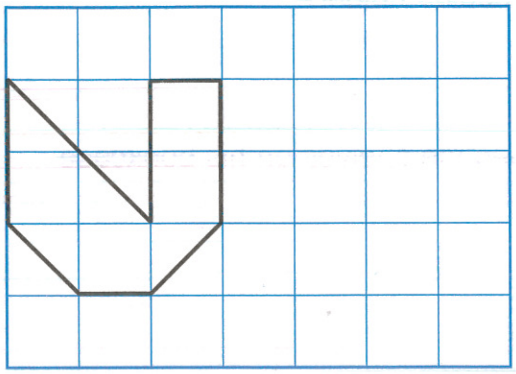
Number model: _____

Date Time

LESSON 11·3

Math Boxes

1. Draw the figure after it is translated to the right.



SRB 107

2. Find the solution of each open sentence.

a. $\frac{7}{8} - s = \frac{1}{8}$ $s =$ _____

b. $t + \frac{1}{4} = \frac{1}{2}$ $t =$ _____

c. $\frac{3}{10} - m = \frac{1}{5}$ $m =$ _____

d. $\frac{2}{8} + x = \frac{3}{4}$ $x =$ _____

SRB 55 148

3. Name the first ten multiples of each number.

a. 6 _____, _____, _____, _____, _____, _____, _____, _____, _____, _____

b. 86 _____, _____, _____, _____, _____, _____, _____, _____, _____, _____

SRB 9

4. Insert parentheses to make each number sentence true.

a. $98.3 + 1.7 * 2.5 = 250$

b. $21.7 / 3 + 4 = 3.1$

c. $56.3 + 3.7 * 3 > 5 * 30$

d. $13.8 - 8.3 = 26.15 - 23.4 * 2$

SRB 150

5. Gum costs $0.80 per pack. What is the cost of

a. 4 packs of gum? _____

b. 10 packs of gum? _____

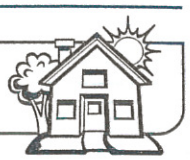
c. 16 packs of gum? _____

d. 33 packs of gum? _____

Name Date Time

STUDY LINK 11·3

Geometry Riddles



SRB 101–103

Answer the following riddles.

1. I am a geometric solid.
I have two surfaces.
One of my surfaces is formed by a circle.
The other surface is curved.

What am I? _____

2. I am a geometric solid.
I have one square base.
I have four triangular faces.
Some Egyptian pharaohs were buried in tombs shaped like me.

What am I? _____

3. I am a polyhedron.
I am a prism.
My two bases are hexagons.
My other faces are rectangles.

What am I? _____

4. I am a polyhedron.
All of my faces are the same.
All of my faces are equilateral triangles.
I have eight faces.

What am I? _____

Try This

5. Write your own geometry riddle.

_____

_____

_____

_____

_____

_____

_____

Practice

6. $-\$20 + \$30 =$ _____

7. _____ $= -\$35 + (-\$35)$

8. _____ $= \$10 + (-\$25)$

9. $\$0 + (-\$100) =$ _____

10. $-\$15 + (-\$40) =$ _____

11. _____ $= -\$300 + (-\$100)$