

LESSON
12.2

Sketching Solids

BEFORE

You classified solids.

Now

You'll sketch solids.

WHY?

So you can sketch three views of a gift box, as in Ex. 16.

Word Watch

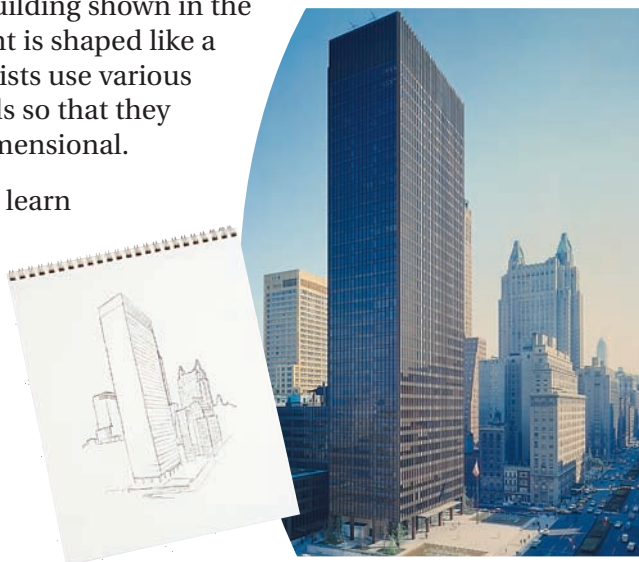
Review Words

- solid, p. 583
- prism, p. 583
- pyramid, p. 583
- cylinder, p. 583
- cone, p. 583
- sphere, p. 583
- edge, p. 584
- vertex, p. 584

In the Real World

City Buildings The building shown in the photograph at the right is shaped like a rectangular prism. Artists use various methods to draw solids so that they appear to be three-dimensional.

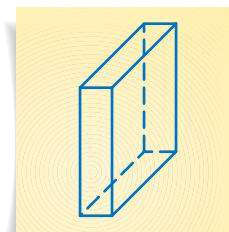
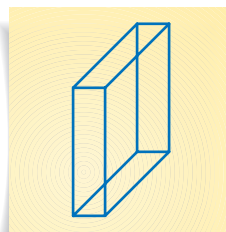
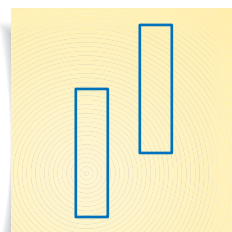
In Example 1, you will learn a method to sketch a rectangular prism. You can use this method to sketch other solids.



EXAMPLE 1 Sketching a Prism

Sketch a rectangular prism.

- 1 Sketch two congruent rectangles.
- 2 Connect the corresponding vertices using line segments.
- 3 Make any "hidden" lines dashed.



HELP with Solving

In Example 1, notice that four of the faces appear to be parallelograms even though they are actually rectangles. The parallelograms give the illusion of depth.

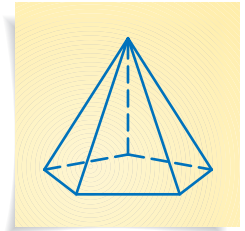
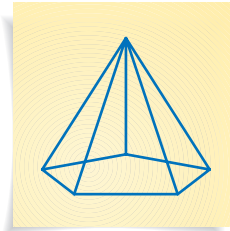
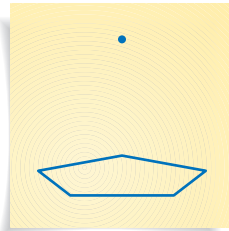
Your turn now Sketch the solid.

1. Triangular prism
2. Prism with square bases

EXAMPLE 2 Sketching a Pyramid

Sketch a pentagonal pyramid.

- 1 Sketch a pentagon for the base and draw a dot directly above the pentagon.
- 2 Connect the vertices of the pentagon to the dot.
- 3 Make any “hidden” lines dashed.



Three Views Another way to represent a three-dimensional figure using a two-dimensional drawing is to sketch three different views of the figure: a *top* view, a *side* view, and a *front* view.

EXAMPLE 3 Sketching Three Views of a Solid

Sketch the top, side, and front views of the cone.



Solution

The top view of a cone is a circle.



The side view of a cone is a triangle.



The front view of a cone is also a triangle.



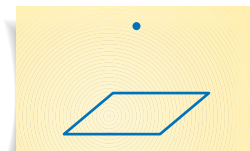
Your turn now Complete the following exercises.

3. Sketch a rectangular pyramid.
4. Sketch the top, side, and front views of the rectangular pyramid you sketched in Exercise 3.



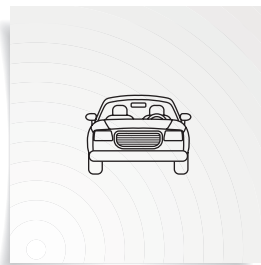
Getting Ready to Practice

- Vocabulary** Copy and complete: Three two-dimensional views of a solid are the view, the view, and the view.
- Copy the partial sketch of a pyramid with a square base. Then complete the drawing.

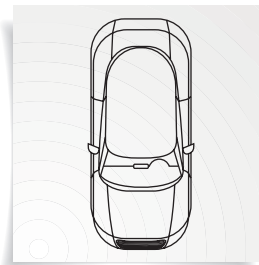


Cars Tell whether the view shown is the *top*, *side*, or *front* view of a car.

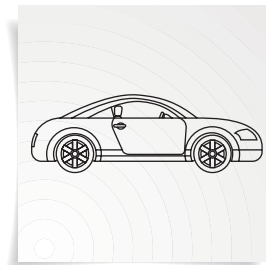
3.



4.



5.



Practice and Problem Solving

with Homework

Example Exercises

- | | |
|---|-------|
| 1 | 6-11 |
| 2 | 6-11 |
| 3 | 13-16 |



Online Resources
CLASSZONE.COM

- More Examples
- eTutorial Plus

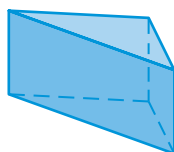
Sketch the solid.

- | | | |
|-----------------------|---------------------|-----------------------|
| 6. Triangular pyramid | 7. Pentagonal prism | 8. Hexagonal prism |
| 9. Cone | 10. Cylinder | 11. Hexagonal pyramid |

12. Writing Describe how to sketch a sphere.

Sketch the top, side, and front views of the solid.

13.



14.



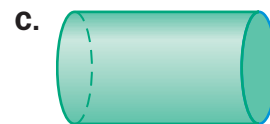
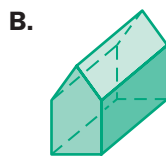
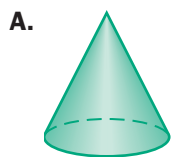
15.



- 16. Gift Box** Sketch the top, side, and front views of the gift box shown.



17. **Critical Thinking** A student sketches a solid that has five faces. Four of the faces are triangles, and one of the faces is a rectangle. What type of solid did the student sketch? Be as specific as possible.
18. For which solid(s) is at least one of its three views a rectangle? a triangle? a circle?



Challenge Sketch a solid with the given numbers of faces, edges, and vertices.

19. 5 faces, 8 edges, 5 vertices

20. 4 faces, 6 edges, 4 vertices

Mixed Review

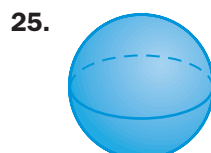
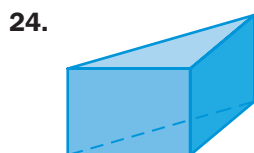
Write the percent as a decimal. (Lesson 9.3)

21. 76%

22. 209%

23. 0.1%

Classify the solid. Be as specific as possible. (Lesson 12.1)



Basic Skills Copy and complete the statement.

27. 1.2 cm = ? m

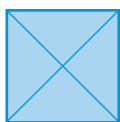
28. 20 kL = ? L

29. 0.27 g = ? mg

Test-Taking Practice

30. **Multiple Choice** Which solid has the three views shown?

Top



Side



Front



- A. Triangular prism
- B. Triangular pyramid
- C. Rectangular prism
- D. Rectangular pyramid
31. **Short Response** Sketch a triangular pyramid. Then count the number of faces, edges, and vertices in the pyramid.