

Explore It!



ACTIVITY

Jamal is breaking down items for recycling and wonders what this box will look like when it is unfolded and flat.



Lesson 7-5 Represent Solid Figures Using Nets



Go Online | PearsonRealize.com

I can...
represent solid figures using
nets.



MAFS.6.G.1.4 Represent three-dimensional figures using nets made up of rectangles and triangles...
MAFS.K12.MP.1.1, MP.2.1, MP.3.1, MP.6.1, MP.7.1

A. How do the sides of the box help you think about what the unfolded box will look like?

B. How can you use the grid to represent the unfolded box?

= 1 square inch.

Focus on math practices

Reasoning Is there another way to represent the unfolded box on the grid?
Explain.



EXAMPLE 1



Classify Solids

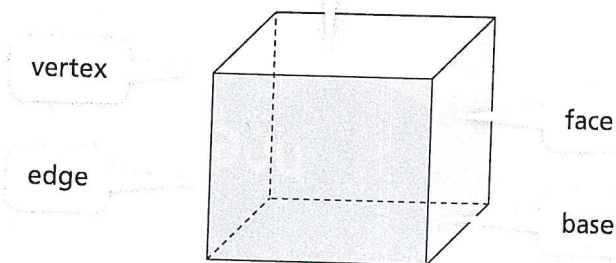
Scan for Multimedia



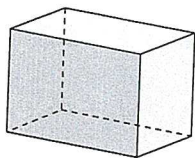
How can you classify a polyhedron?

A polyhedron is a three-dimensional solid figure made of flat polygon-shaped surfaces called faces. The line segment where two faces intersect is called an edge. The point where several edges meet is called a vertex.

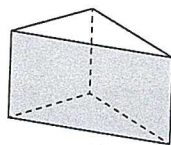
The top and bottom of a prism are called its bases.



Prisms



Rectangular prism

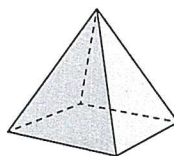


Triangular prism

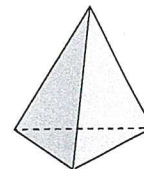
- Prisms have polygonal faces.
- Prisms have two identical, parallel, polygon-shaped bases.
- Prisms are named by the shape of their bases.

Pyramids

The base of a pyramid is the face opposite the vertex where the triangular faces meet.



Square pyramid



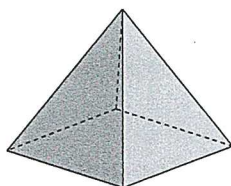
Triangular pyramid

- Pyramids have one base.
- Pyramids are named by the shape of their bases.
- All other faces of pyramids are triangular.



Try It!

Classify this solid figure.



Convince Me! What attributes of a solid figure should you identify to classify it as a polyhedron?



EXAMPLE 2



Identify a Solid Figure from a Net



ACTIVITY

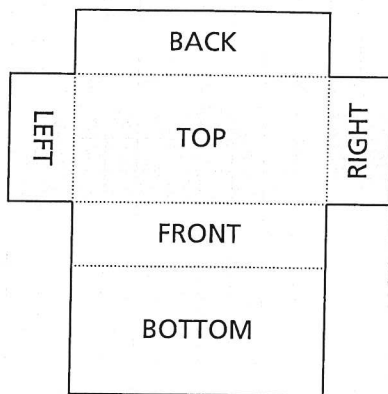


ASSESS

What solid is represented by the net?

To identify a solid figure, determine the number and types of faces in the net.

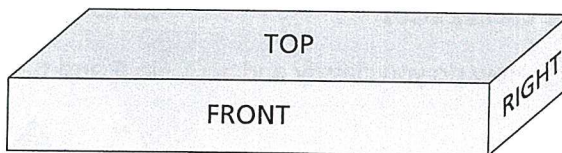
A net is a plane figure pattern which, when folded, makes a solid.



Use Structure How can you use the structure of the net to identify the solid figure?

The net shows three pairs of identical rectangular faces.

This is a net of a rectangular prism.



EXAMPLE 3



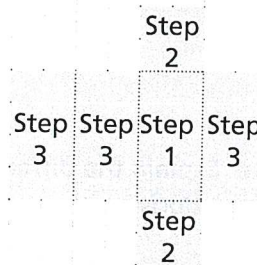
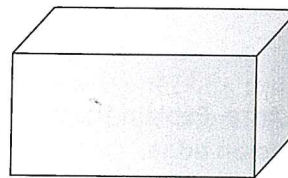
Draw a Net of a Solid Figure

How can you draw a net of a rectangular prism that has a height of 2 units and bases that are 4 units long and 2 units wide?

STEP 1 Draw one base of the prism.

STEP 2 Above and below the base, draw a rectangle with the same width as the base and a height of 2 units.

STEP 3 Draw three additional rectangles, in line with the base, that have the same length as the base and a width of 2 units.



Be Precise How can you determine whether the dimensions in the net match the dimensions of the rectangular prism?



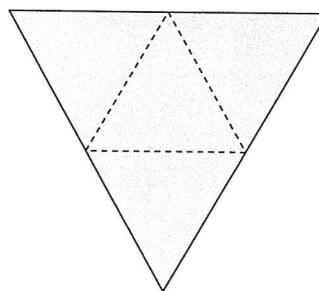
Try It!

Identify the solid from its net.

Shape of polygonal faces:

Shape of base(s):

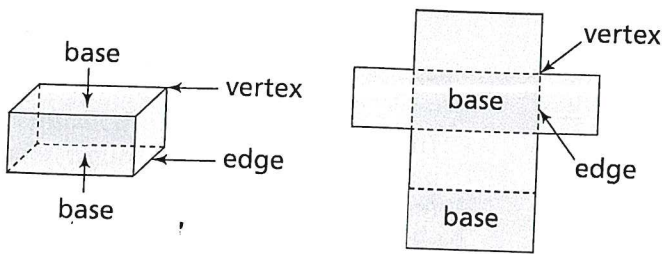
This is a net of a



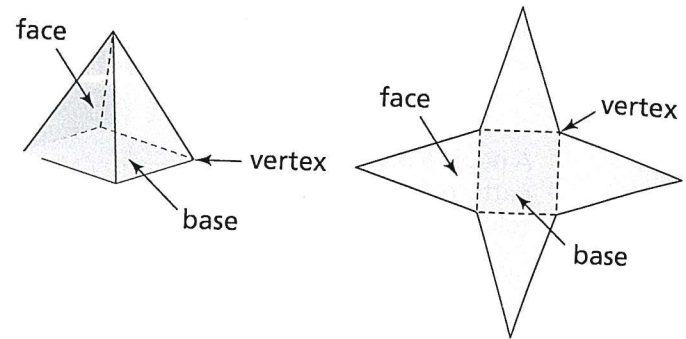


You can use nets to represent solid figures.

Prism



Pyramid



Do You Understand?

1. **Essential Question** How do you classify and represent solid figures?

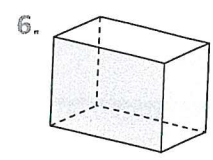
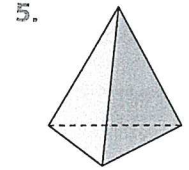
2. **Use Structure** Explain the difference between a vertex and an edge.

3. **Be Precise** Explain the difference between a pyramid and a prism.

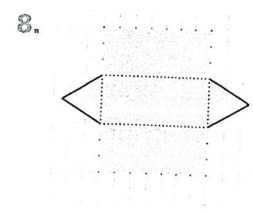
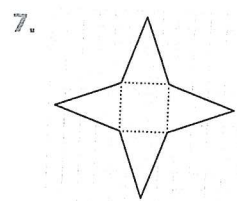
4. Describe the net of a triangular prism.

Do You Know How?

In 5 and 6, classify the solid figures.



In 7 and 8, identify each solid from its net.



9. Draw a net of a rectangular prism that has a height of 2 units and bases that are 3 units long and 1 unit wide.



Name: _____



PRACTICE



TUTORIAL

Practice & Problem Solving

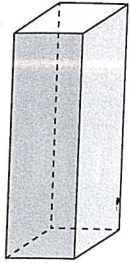


Scan for
Multimedia

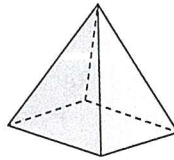


In 10–12, classify the solid figures.

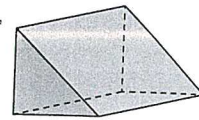
10.



11.

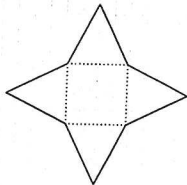


12.

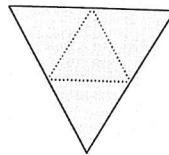


In 13–15, identify each solid from its net.

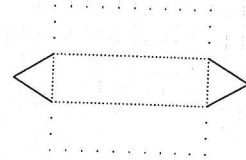
13.



14.



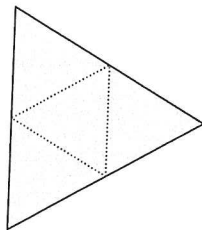
15.



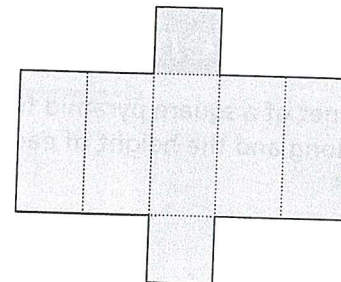
16. Ryan is going to draw a net of a rectangular prism. How many rectangles should there be in his drawing?

17. Kayla is going to draw a net of a square pyramid. How many triangles should there be in her drawing?

18. **Make Sense and Persevere** Zari folds the net below into a model of a solid figure. How many edges, faces, and vertices does the model have?



19. **Critique Reasoning** Tomas says that the net below can be folded to make a rectangular prism. Do you agree with Tomas? Explain.



In 20–22, use the table at the right.

20. **Look for Relationships** The Swiss mathematician Leonhard Euler (OY-ler) and the French mathematician René Descartes (dā KART) both discovered a pattern in the numbers of edges, vertices, and faces of polyhedrons. Complete the table. Describe a pattern in the table.

Polyhedron	Faces (F)	Vertices (V)	$F + V$	Edges (E)
Triangular Pyramid				
Rectangular Pyramid				
Triangular Prism				
Rectangular Prism				

21. **Higher Order Thinking** Write an equation that relates the number of edges, E , to the number of faces, F , and vertices, V .

22. Use the equation that you wrote in Exercise 21 to find the number of vertices of a cube, which has 12 edges and 6 faces.

23. Corey bought the mailing tube shown at the right to mail a poster of the Gators Little League baseball team.

a. The mailing tube has the shape of which polyhedron?

b. How many faces does the mailing tube have?

c. When Corey bought the mailing tube, it was unfolded and looked like a net. What polygons would Corey have seen in the unfolded mailing tube?



Assessment Practice

24. Draw a net of a square pyramid for which the base is 2 units long and the height of each triangular face is 5 units.

6.G.1.4

