Slice or Spin

Tell flat cross-sections from solids made by rotation.

CCSS.Math.Content.HSG-GMD.B.4 "Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects."

NAME _____ DATE _____

FLAT SLICE

A cross-section is a flat, two-dimensional shape made when a solid is cut. It has length and width, but no thickness.

A hexagon can be the cross-section when a hexagonal prism is sliced parallel to its base.



SPUN SOLID

A solid of rotation is a three-dimensional object made by spinning a flat region around a line. It has length, width, and height.

A hemisphere can be made by rotating a quarter-circle region around one of its straight sides.



1 SORT

8 items

For each figure, circle **SLICE** or **ROTATION**, then choose two figures and explain how you knew their categories.

1.

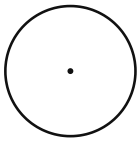


Figure 1

SLICE ROTATION

2.

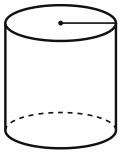


Figure 2

SLICE ROTATION

3.

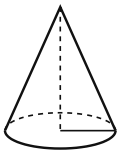


Figure 3

SLICE ROTATION

4.



Figure 4

SLICE ROTATION

5.

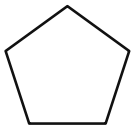


Figure 5

SLICE ROTATION

6.

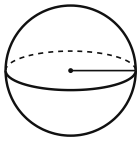


Figure 6

SLICE ROTATION

7.

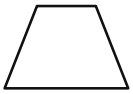


Figure 7

SLICE ROTATION

8.

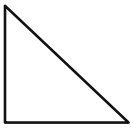


Figure 8

SLICE ROTATION

2 PROVE IT

Explain your thinking

Pick two items from Part 1. For each one, tell how you knew where it belonged.

ITEM # _____ **HOW I KNEW** _____

ITEM # _____ **HOW I KNEW** _____

3 MAKE YOUR OWN

One of each

Write one new example of a **SLICE** and one new example of a **ROTATION**.

SLICE _____

ROTATION _____

CHALLENGE

A rectangle is rotated around one of its sides. Name the solid formed and explain why.

ANSWER KEY # Slice or Spin

PART 1 · SORT

#	ITEM	CATEGORY	WHY
1	Figure 1 (circle)	**SLICE**	A circle is a flat, two-dimensional shape and can be a cross-section.
2	Figure 2 (cylinder)	**ROTATION**	A cylinder is a three-dimensional solid that can be made by rotating a rectangle around one side.
3	Figure 3 (cone)	**ROTATION**	A cone is a three-dimensional solid that can be made by rotating a right triangle around a leg.
4	Figure 4 (rectangle)	**SLICE**	A rectangle is flat and can be a cross-section.
5	Figure 5 (pentagon)	**SLICE**	A pentagon is a flat, two-dimensional shape and can be a cross-section.
6	Figure 6 (sphere)	**ROTATION**	A sphere is a three-dimensional solid that can be made by rotating a semicircle around its diameter.
7	Figure 7 (trapezoid)	**SLICE**	A trapezoid is flat and can be a cross-section.
8	Figure 8 (right_triangle)	**SLICE**	A right triangle is a flat, two-dimensional shape and can be a cross-section.

PART 2 · PROVE IT

Accept any explanation that names the deciding feature from the rule box for the chosen item.

PART 3 · MAKE YOUR OWN (SAMPLE ANSWERS)

- **SLICE**: A square cross-section made by slicing a cube parallel to one face.
- **ROTATION**: A torus made by rotating a circle around a coplanar line that does not cross the circle.

Challenge: A cylinder is formed because every point of the rectangle moves in a circle around the side used as the axis of rotation.

Items 1, 4, 5, 7, and 8 are SLICE. Items 2, 3, and 6 are ROTATION. For Part 2, accept explanations that use dimensionality and, for solids, identify spinning a flat region around an axis.