

Slice Shape Detective

Identify the flat shape made by each cut.

HIGH SCHOOL • MA.912.GR.4.1

MA.912.GR.4.1 "Identify the shapes of two-dimensional cross-sections of three-dimensional figures."

NAME _____

DATE _____

TRACK THE CUTTING PLANE

A cross-section is the two-dimensional shape made where a flat plane cuts a solid. In a prism or cylinder, a slice parallel to the base has the same shape as the base. In a pyramid or cone, a slice parallel to the base has the same basic shape, but it is smaller.

WORKED EXAMPLE

A regular pentagonal prism is sliced by a plane parallel to its bases.
What is the cross-section?

1. The bases of the prism are pentagons.
2. The cutting plane is parallel to the bases.
3. A parallel slice of a prism matches the base shape.

Answer: pentagon

PRACTICE 6 problems

- 1** A cube is sliced by a plane parallel to one of its faces. What is the cross-section?

ANSWER _____

- 2** A right rectangular prism is sliced by a plane parallel to its rectangular base. What is the cross-section?

ANSWER _____

- 3** A triangular prism is sliced by a plane parallel to its triangular bases. What is the cross-section?

ANSWER _____

- 4** A cylinder is sliced by a plane parallel to its circular bases. What is the cross-section?

ANSWER _____

- 5** A cone is sliced by a plane parallel to its circular base. What is the cross-section?

ANSWER _____

- 6** A sphere is sliced by a plane through its center. What is the cross-section?

ANSWER _____

APPLY IT Show your work

- 1** A robotics club designs a solid cylindrical battery case. To check the inside, a technician makes a flat cut parallel to the circular ends of the case. What shape is the cut surface?

WORK SPACE

ANSWER _____

- 2** A student designs a square-pyramid skylight for a digital architecture project. A flat pane cuts through the top point of the pyramid and along a diagonal of its square base. What shape is the cross-section?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A cube is cut by a plane through the midpoints of the three edges that meet at one corner. What is the cross-section? Explain why.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A cube is sliced by a plane parallel to one of its faces. What is the cross-section?	square
2	A right rectangular prism is sliced by a plane parallel to its rectangular base. What is the cross-section?	rectangle
3	A triangular prism is sliced by a plane parallel to its triangular bases. What is the cross-section?	triangle
4	A cylinder is sliced by a plane parallel to its circular bases. What is the cross-section?	circle
5	A cone is sliced by a plane parallel to its circular base. What is the cross-section?	circle
6	A sphere is sliced by a plane through its center. What is the cross-section?	circle

PART 2 • APPLY IT

1. **circle** The battery case is a cylinder. A plane parallel to a cylinder's circular bases makes a circular cross-section.
2. **triangle** The plane meets the pyramid at the top point and at the two endpoints of the base diagonal. These three points form a triangular cross-section.

CHALLENGE

equilateral triangle. The plane meets the cube on exactly three edges, making a triangle, and the segments joining the midpoints are equal in length.

Accept singular shape names and equivalent descriptions such as "circular cross-section" for circle. For the challenge, accept "equilateral triangle" with reasoning that the plane intersects three edges and creates three equal sides.