

Classifying Three-Dimensional Solids - Lesson 4

Teacher Guide

Duration: 20 minutes

Standards for Mathematics

TEKS.2.8.B.iv

Classify three-dimensional solids, including rectangular prisms (including cubes as special rectangular prisms), based on attributes using formal geometric language.

Focus Strategies

Think Aloud: The teacher models a process of thinking by speaking aloud what is thought. As an example, 'I think I need more color here in my drawing.' This strategy models for students the type of thinking they can use in an upcoming activity.

Think-Pair-Share: Students are prompted to think about an idea on their own. Students then share their idea with a partner and have a quick discussion. Selected students are asked to share their ideas with the whole group.

Materials

a set of three-dimensional solid models (cubes, rectangular prisms, spheres, cones), chart paper, markers a projector or smartboard

Key Vocabulary

solid, rectangular prism, cube, face, base, edge, vertex

Warm-Up

Begin with a quick review of two-dimensional shapes. Ask students to name some shapes they know and discuss their attributes (sides, angles). Transition to three-dimensional shapes by asking if they know any shapes that are not flat.

Introduction

Explain to students that today they will learn how to classify three-dimensional solids. Introduce the concept of examples and non-examples, explaining that understanding what something is and what it is not will help them define the shapes better.

Exploration & Whole Class Discussion

Show pairs of examples and non-examples: a cube (example) and a sphere (non-example), a rectangular prism (example) and a cylinder (non-example). Ask students to think about what makes the example a rectangular prism and why the non-example does not fit. Encourage discussion using questions like, 'What do you notice about the faces of the cube?' and 'How many edges does a rectangular prism have?' Allow students to discuss their thoughts with a partner.

Application & Reflection

Have students draw a rectangular prism and a cube on their own paper, labeling the faces, edges, and vertices. After they finish, ask them to write a sentence or two explaining how they know their shapes are rectangular prisms or cubes. Then, have them share their reflections with a partner.

Assessment

Collect the drawings and written explanations to assess students' understanding of the attributes of rectangular prisms and cubes. Look for correct identification of faces, edges, and vertices, as well as the use of appropriate vocabulary.

Strategies to Support Emergent Bilingual Students

To support emergent bilingual students, we recommend the following:

1. Provide independent think time after asking questions or posing prompts.
2. Have students pair up with a partner to generate responses together.
3. Have students restate each other's reasoning in classroom discussions.
4. Create a public record of classroom discussions.
5. Use color and annotation to help learners make connections for concepts.
6. Introduce academic vocabulary as needed.
7. Use iconic and semantic gestures to help students understand.

Additional Support Resources

If your students need additional support, you can click on one of the lessons below and present it to your whole class. You can use the interactive manipulatives and built in feedback to support students in a whole class discussion. Good questions to ask are 'What do you see?', 'What do you think?' 'What do you wonder?'



Identifying Prisms



Identifying Real-World Prisms and Cylinders

Sample Lesson Flow

- TEACHER SAY** *Welcome, everyone! Today, we are going to explore three-dimensional solids. Can anyone remind me what a two-dimensional shape is?*
- STUDENTS DO** Raise hands to share their ideas about two-dimensional shapes.
- TEACHER SAY** *Great! Now, can anyone tell me if there are shapes that are not flat? What do we call those?*
- STUDENTS DO** Respond with answers like '3D shapes' or 'solid shapes.'
- TEACHER SAY** *Exactly! Today, we will learn how to classify three-dimensional solids. Let's start by looking at some examples and non-examples.*
- TEACHER DO** Display a cube and a sphere using physical models or on the screen.
- TEACHER SAY** *Here we have a cube. What do you notice about its faces?*
- STUDENTS DO** Discuss with a partner what they notice about the cube's faces.
- TEACHER SAY** *Now, compare it to this sphere. Why is the sphere not a cube?*
- STUDENTS DO** Share their thoughts with their partner.
- TEACHER SAY** *Let's write down some of your observations. What makes a cube a cube?*
- STUDENTS DO** Raise hands to share observations about the cube.
- TEACHER DO** Record students' observations on chart paper.
- TEACHER SAY** *Now, let's look at a rectangular prism and a cylinder. What do you notice about the rectangular prism?*
- STUDENTS DO** Discuss with a partner the attributes of the rectangular prism.
- TEACHER SAY** *How many edges does a rectangular prism have? And how does that compare to the cylinder?*
- STUDENTS DO** Share their thoughts about the edges of both shapes.
- TEACHER DO** Display the rectangular prism and cylinder on the board.
- TEACHER SAY** *Now, I want you to draw a rectangular prism and a cube on your own paper. Label the faces, edges, and vertices.*
- STUDENTS DO** Draw and label their shapes.
- TEACHER SAY** *Once you finish, write a sentence or two explaining how you know your shapes are rectangular prisms or cubes.*
- STUDENTS DO** Write their explanations.
- TEACHER SAY** *Now, turn to your partner and share your reflections.*
- STUDENTS DO** Share their reflections with a partner.
- TEACHER SAY** *Great job today! I will collect your drawings and written explanations to see how well you understand the attributes of rectangular prisms and cubes.*
- STUDENTS DO** Hand in their drawings and explanations.