Sorting Three-Dimensional Solids - Lesson 4

Teacher Guide

Duration: 20 minutes

Standards for Mathematics

TEKS.2.8.B.ix

Sort 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 other solids), chart paper, markers

Key Vocabulary

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

Warm-Up

Begin with a quick review of 3D shapes. Ask students to name some solids they know and describe their attributes (e.g., how many faces, bases, edges, and vertices).

Introduction

Explain to students that today they will be sorting three-dimensional solids based on their attributes. Introduce the concept of examples and non-examples, explaining that some objects can be related to other objects but there can be a difference in one attribute that makes all the difference in naming the object correctly.

Exploration & Whole Class Discussion

Choose a set of 4 to 8 objects or drawings from your collection, including examples and non-examples for each attribute, (e.g., show objects such as a cylinder, rectangular prism, cube, and triangular prism, and related drawings). Ask students, 'Which of these items have two bases?' Which of these items have rectangular faces?' How is a rectangular prism different from a triangular prism? from a cube?' Ask student pairs to discuss how the attributes of a rectangular prism compare with a cube, and how the drawings relate to the solids.

Application & Reflection

Present a final set of real-world objects, solids, and images of the solids. Ask students to sort these items into rectangular prisms, cubes, and non-examples. Have students independently sort by writing down the letters of the objects and images. Then, in pairs, have them share their lists. Ask students to define the specific attributes for both a rectangular prism and a cube.

Assessment

Observe student discussions and their ability to articulate the attributes of both cubes and rectangular prisms. Collect the chart paper with their examples and non-examples to assess their understanding of the concept. Additionally, ask students to write a short reflection on what they learned about the relationship between rectangular prisms and cubes.

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 questons to ask are 'What do you see?', 'What do you think?' 'What do you wonder?'

Identifying Real-World Shapes by Number of Faces

Identifying Real-World 3D Shapes by Types of Faces

Sample Lesson Flow

TEACHER SAY	*Today, we are going to explore three-dimensional solids! Can anyone name some solids they know? What are their attributes?*
STUDENTS DO	Raise hands to share names and attributes of solids.
TEACHER DO	Write down students' responses on the board.
TEACHER SAY	*Great! Now, we will sort these solids based on their attributes. First, let's look at some examples and non-examples.*
TEACHER DO	Display a set of 4 to 8 objects or drawings, including a cylinder, rectangular prism, cube, and triangular prism.
TEACHER SAY	*Which of these items have two bases? Which have rectangular faces? How is a rectangular prism different from a triangular prism or a cube?*
STUDENTS DO	Discuss in pairs how the attributes of a rectangular prism compare with a cube and how the drawings relate to the solids.
TEACHER DO	Walk around to listen to student discussions and provide support as needed.
TEACHER SAY	*Now, I will present a final set of real-world objects and images of solids.*
TEACHER DO	Show the final set of objects.
TEACHER SAY	*I want you to sort these items into rectangular prisms, cubes, and non-examples. Write down the letters of the objects and images in your math booklet.*
STUDENTS DO	Independently sort the items and write their lists.
TEACHER DO	After a few minutes, ask students to share their lists with a partner.
TEACHER SAY	*Now, can you define the specific attributes for both a rectangular prism and a cube?*
STUDENTS DO	Discuss and define the attributes with their partner.
TEACHER DO	Observe student discussions and their ability to articulate the attributes.
TEACHER SAY	*Finally, I would like you to write a short reflection on what you learned about the relationship between rectangular prisms and cubes.*
STUDENTS DO	Write their reflections in their math booklet.