Sorting Shapes: Understanding Attributes

Teacher Guide

Duration: 20 minutes

Standards for Mathematics

TEKS.1.6.A.iii

Sort regular two-dimensional shapes based on attributes using informal 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 shape cards (a variety of regular and irregular shapes), a whiteboard markers

Key Vocabulary

regular, irregular, side, corner, attribute, sort, circle, square, triangle, hexagon, rhombus, rectangle

Warm-Up

Begin with a quick review of the shapes students already know. Ask students to name different shapes and describe the attributes of each shape.

Introduction

Explain to students that today they will be sorting shapes based on their attributes. Introduce the Examples / Non-Examples routine and explain that they will look at pairs of shapes to understand what makes a shape a certain type.

Exploration & Whole Class Discussion

Show the first set of shapes: a square, rectangle, rhombus (examples), and non-examples: equilateral triangle, scalene triangle, regular hexagon. Ask students, 'What attribute could you use for these sorted shapes? How are the example shapes similar, yet different from the non-examples?' Allow student pairs to discuss. Then, ask students, 'Sort these shapes so that all the 4-sided figures are in a group.' Reconvene the class, asking pairs share their sets. Guide discussion to highlight attributes. Then, ask students, 'Now sort these shapes to create a group of regular shapes.

Application & Reflection

Show another mixed set of shapes: three triangles (equilateral, scalene, isosceles), a circle, and 3 four-sided shapes (e.g.,square, rectangle, rhombus). Ask students, 'Sort these shapes into two groups, regular and irregular shapes.' Repeat discussion and sharing. After discussing the sorted shapes, ask students to write what makes shapes regular.

Assessment

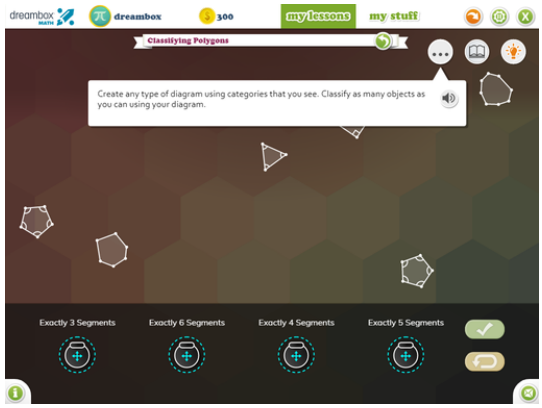
As a formative assessment have student pairs discuss and revise their explanations for attributes of regular shapes. Observe student discussions to assess their understanding of regular shapes.

Strategies to Support Emergent Bilingual Students

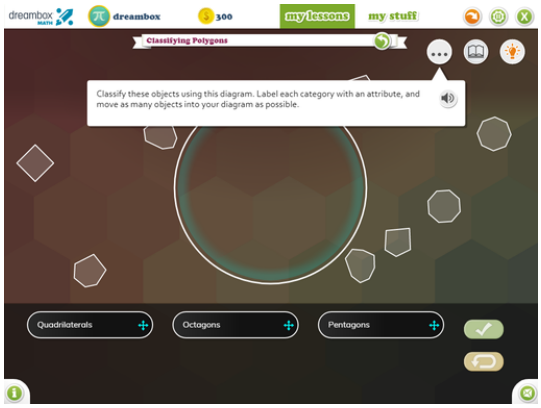
To support emergent bilingual students, we recommend the following:
1. Provide independent think time after asking questions or posing prompts.
2. Have students pair up with a partner to generate responses together.
3. Have students restate each other's reasoning in classroom discussions.
4. Create a 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?'



Classifying Figures: Polygon Types



Classifying Figures: Polygon Types

Sample Lesson Flow

TEACHER SAY	*Today we are going to continue our exploration of shapes. Can anyone remind me what a closed shape is? What are some examples?*
STUDENTS DO	Raise hands to share examples of closed shapes and their attributes.
TEACHER DO	Record students' responses on the whiteboard.
TEACHER SAY	*Great! Now, today we will learn about regular shapes. Regular shapes have all sides equal and all angles equal. Let's look at some examples and non-examples to understand this better.*
TEACHER DO	Show the first pair of shape cards: one irregular shape (e.g., a scalene triangle) and one regular shape (e.g., an equilateral triangle).
TEACHER SAY	*What do you notice about these shapes? How are they different? Discuss with your shoulder partner.*
STUDENTS DO	Turn to shoulder partner and discuss the differences between the shapes.
TEACHER DO	After a few minutes, bring the class back together.
TEACHER SAY	*Who would like to share their observations?*
STUDENTS DO	Raise hands to share observations. Selected students share their thoughts.
TEACHER DO	Record key observations on the board.
TEACHER SAY	*Let's look at another pair of shapes. This time, we have a rhombus and a square. What attributes can we use to sort these shapes? Discuss with your partner again.*
STUDENTS DO	Discuss with shoulder partner.
TEACHER DO	After a minute, ask for volunteers to share their thoughts.
TEACHER SAY	*Excellent! Now, let's sort these shapes into groups based on the number of sides.*
TEACHER DO	Distribute a set of shape cards to each pair of students.
TEACHER SAY	*Sort these shapes so that all the 4-sided figures are in one group.*
STUDENTS DO	Work in pairs to sort the shapes.
TEACHER DO	After a few minutes, bring the class back together.
TEACHER SAY	*How did you sort the shapes? What did you notice?*
STUDENTS DO	Share their sorting methods and observations.
TEACHER SAY	*Now, let's sort these shapes again, but this time from the least number of straight sides to the greatest number of straight sides.*
STUDENTS DO	Sort the shapes again based on the new criteria.
TEACHER DO	After sorting, ask students to reflect on their learning.
TEACHER SAY	*Think about what you learned today about irregular shapes. Write down your own definition of what makes a shape regular based on our discussions.*
STUDENTS DO	Write their definitions in their math booklets.

TEACHER SAY	*Now, share your definitions with a partner.*
STUDENTS DO	Turn to their partner and share their definitions.
TEACHER DO	Observe students during the partner discussions and take notes on their understanding.
TEACHER SAY	*For our final activity, I want each of you to sort your own set of shapes in a way that makes sense to you. Then, discuss with your partner what attribute you used to sort them.*
STUDENTS DO	Sort their shapes and discuss with their partner.
TEACHER DO	Walk around to assess students' understanding and provide support as needed.