Lesson Overview

LESSON 33

Shapes

Lesson Objectives

Content Objectives

- Identify the defining attributes of a shape.
- Distinguish between defining and non-defining attributes.
- Classify a shape based on its defining attributes.

Language Objectives

- Draw a shape based on given attributes or its name.
- Use an index card as a tool to determine if a shape has a square corner and to compare the shape's side lengths.
- Orally describe what is the same and what is different about a given group of shapes.
- Relate three-dimensional figures to everyday objects.

Prerequisite Skills

- Recognize and name basic two-dimensional shapes.
- Recognize similarities and differences among shapes.
- Draw basic shapes.

Standards for Mathematical Practice (SMP)

SMPs 1, 2, 3, 4, 5, and 6 are integrated in every lesson through the *Try-Discuss-Connect* routine.*

In addition, this lesson particularly emphasizes the following SMPs:

4 Model with mathematics.

5 Use appropriate tools strategically.

6 Attend to precision.

*See page 431i to see how every lesson includes these SMPs.

Lesson Vocabulary

- **circle** a flat shape with no sides and no corners.
- **cone** a solid shape that slopes from a circular face to a point.
- **corner** a point where two sides of a shape meet.
- **cube** a solid shape with 6 square faces and all sides of equal length.
- **cylinder** a solid shape like a can.
- **edge** a line where two faces meet in a solid shape.
- **face** a flat surface of a solid shape.
- **hexagon** a flat shape with 6 straight sides and 6 corners.
- **rectangle** a flat shape with 4 sides and 4 square corners. The opposite sides have the same length.
- **rectangular prism** a solid shape with 6 rectangular faces.
- **rhombus** a flat shape with 4 sides and 4 corners. All sides have the same length.
- **side** a line that makes part of a flat shape.
- **sphere** a solid shape like a ball.
- **square** a flat shape with 4 straight sides of equal length and 4 square corners.
- **triangle** a flat shape with 3 straight sides and 3 corners.

Learning Progression

In Kindergarten children explore basic shapes in their world by naming and describing them by their visible attributes.

In Grade 1 children build on the concept of shapes by classifying, composing, and partitioning them.

In this lesson children analyze shapes based on defining attributes and recognize attributes that do not affect the shape name—non-defining attributes. They recognize that some quadrilaterals are named by attributes other than the number of sides and corners and utilize those attributes in classifying them. They name three-dimensional figures and describe the faces.

In Grade 2 children extend their understanding of shapes to include pentagons and draw shapes based on specific attributes.

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Lesson Pacing Guide

Whole Class Instruction

SESSION 1 — Explore — *45–60 min*

Sorting Shapes
- Start *5 min*
- Try It *20 min*
- Connect It *15 min*
- Close: Exit Ticket *5 min*

Additional Practice
Lesson pages 771–772

SESSION 2 — Develop — *45–60 min*

Naming and Describing Two-Dimensional Shapes
- Start *5 min*
- Try It *15 min*
- Discuss It *10 min*
- Model It *5 min*
- Connect It *10 min*
- Apply It *5 min*
- Close: Exit Ticket *5 min*

Additional Practice
Lesson pages 777–778

Fluency Practice
Identify Shapes

SESSION 3 — Develop — *45–60 min*

Naming and Describing Three-Dimensional Shapes
- Start *5 min*
- Try It *15 min*
- Discuss It *10 min*
- Model It *5 min*
- Connect It *10 min*
- Apply It *5 min*
- Close: Exit Ticket *5 min*

Additional Practice
Lesson pages 783–784

Fluency
Naming and Describing Shapes

SESSION 4

Naming and Describing Shapes
- Start *5 min*
- Example and Apply It *10 min*
- Close: Exit Ticket *5 min*

Additional Practice
Lesson pages 787–788

Lesson Quiz or **Digital Comprehension Check**

SESSION 5 — Refine — *45–60 min*

Naming and Describing Shapes
- Apply It and Small Group Differentiation *20 min*
- Close: Exit Ticket *5 min*

Lesson Materials

Lesson *(Required)*	*Per child:* copy of start slide (Session 5), copy of Close slide (Session 1) *For display:* cube, rectangular prism, tape *Activity Sheet:* Shapes 1**
Activities	*Per child:* index card, crayons, whiteboard, marker *Per pair:* geometric solid shapes, 3-foot length of string *For display:* geometric solid shapes *Activity Sheets:* Shapes 1**; 3-Dimensional Shapes Rhyme; Squares, Rectangles, Rhombuses
Math Toolkit	flat shapes, geometric solid shapes set

**Used for more than one activity.

Teacher Toolbox

Small Group Differentiation

PREPARE

Ready Prerequisite Lessons

Grade K
- Lesson 12 Name Shapes
- Lesson 13 See Position and Shape
- Lesson 14 Compare Shapes

RETEACH

Tools for Instruction

Grade K
- Lesson 12 Flat Shapes and Solid Shapes
- Lesson 13 Shape and Position of Objects
- Lesson 14 Describing and Comparing Shapes by Attributes

Grade 1
- Lesson 33 Defining Attributes of Shapes

REINFORCE

Math Center Activities

Grade 1
- Lesson 33 Draw Two Shapes
- Lesson 33 Shape Attributes

EXTEND

Enrichment Activity

Grade 1
- Lesson 33 Building Shapes

i-Ready

Independent Learning

PERSONALIZE

i-Ready Lessons*

Grade 1
- Understand Attributes of Shapes
- Practice: Attributes of Shapes

*We continually update the Interactive Tutorials. Check the Teacher Toolbox for the most up-to-date offerings for this lesson.

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Connect to Family, Community, and Language Development

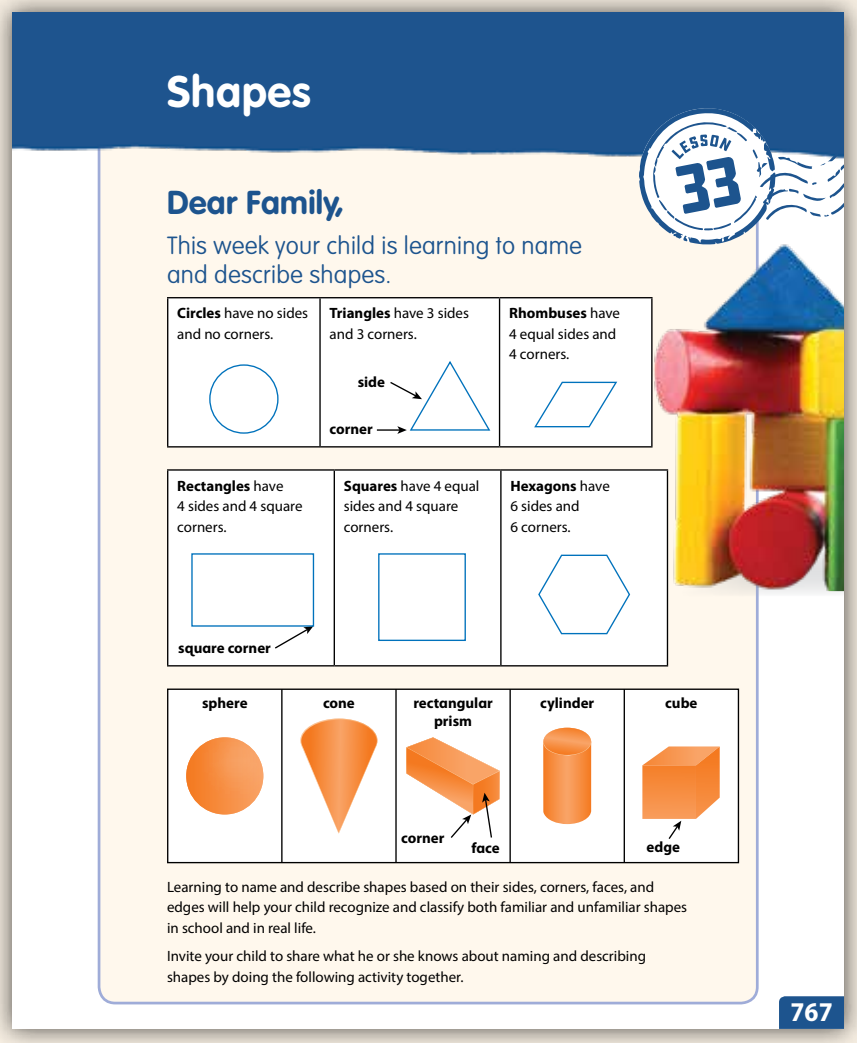
The following activities and instructional supports provide opportunities to foster school, family, and community involvement and partnerships.

Connect to Family

Use the **Family Letter**—which provides background information, math vocabulary, and an activity—to keep families apprised of what their child is learning and to encourage family involvement.

Available in Spanish

Teacher Toolbox



Shapes

LESSON 33

Dear Family,

This week your child is learning to name and describe shapes.

Circles have no sides and no corners.	**Triangles** have 3 sides and 3 corners. (side, corner)	**Rhombuses** have 4 equal sides and 4 corners.
Rectangles have 4 sides and 4 square corners. (square corner)	**Squares** have 4 equal sides and 4 square corners.	**Hexagons** have 6 sides and 6 corners.

sphere	cone	rectangular prism	cylinder	cube
		(corner, face)		(edge)

Learning to name and describe shapes based on their sides, corners, faces, and edges will help your child recognize and classify both familiar and unfamiliar shapes in school and in real life.

Invite your child to share what he or she knows about naming and describing shapes by doing the following activity together.

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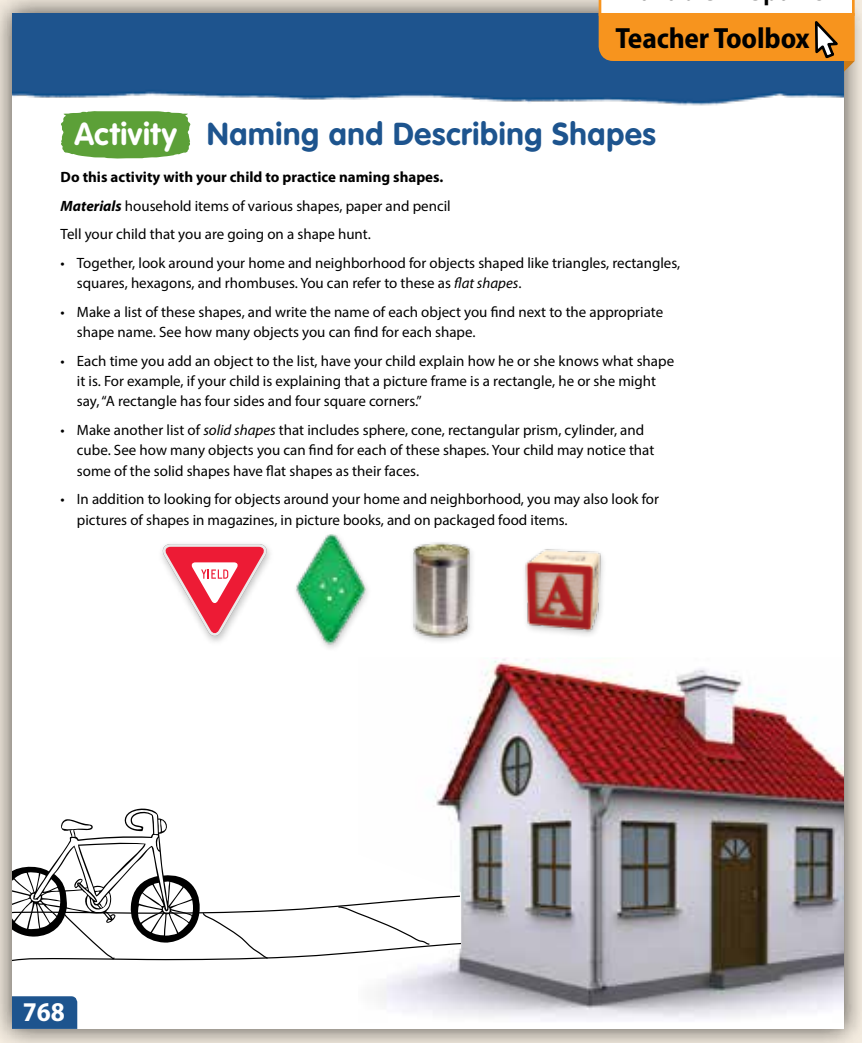

Activity Naming and Describing Shapes

Do this activity with your child to practice naming shapes.

Materials household items of various shapes, paper and pencil

Tell your child that you are going on a shape hunt.

- Together, look around your home and neighborhood for objects shaped like triangles, rectangles, squares, hexagons, and rhombuses. You can refer to these as *flat shapes*.
- Make a list of these shapes, and write the name of each object you find next to the appropriate shape name. See how many objects you can find for each shape.
- Each time you add an object to the list, have your child explain how he or she knows what shape it is. For example, if your child is explaining that a picture frame is a rectangle, he or she might say, "A rectangle has four sides and four square corners."
- Make another list of *solid shapes* that includes sphere, cone, rectangular prism, cylinder, and cube. See how many objects you can find for each of these shapes. Your child may notice that some of the solid shapes have flat shapes as their faces.
- In addition to looking for objects around your home and neighborhood, you may also look for pictures of shapes in magazines, in picture books, and on packaged food items.

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Goal

The goal of the Family Letter is to help children practice naming and describing shapes based on their sides, corners, faces, and edges. This supports children as they learn to classify familiar and unfamiliar shapes.

Activity

Children and their family members will go on a shape hunt around their homes and neighborhoods, keeping a list of shapes they find and discussing the attributes. Look at the *Naming and Describing Shapes* activity and adjust if necessary to connect with children.

Math Talk at Home

Encourage children to notice shapes around them in their everyday lives, such as on the bus, on the playground, or in the car. Ask them to compare and contrast the attributes of the shapes as they find them.

Conversation Starters Below are additional conversation starters children can write in their Family Letter or math journal, with your guidance, to engage family members.

- *What shape is that?*
- *How do you know?*
- *How many sides are there?*

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Connect to Community and Cultural Responsiveness

Use these activities to connect with and leverage the diverse backgrounds and experiences of all children.

Session 1 **Use with *Try It*.**

- Display a photo of a well-known location in the community, such as a library, park, or community center. Ask children to look for shapes in the photo. Have them name the shape and describe it to a partner using terms such as *straight*, *round,* and *sides*.

Session 2 **Use with *Model It*.**

- Create a *Shapes* anchor chart with the class. Include the following vocabulary words with their definitions and an illustration: *hexagon, rectangle, circle, rhombus, square, triangle, side,* and *corner.* Prepare illustrations of these words on note cards in advance and give one to each small group of children. As you introduce the term and write it on the anchor chart, have children holding the accompanying picture match it to the anchor chart.

Session 3 **Use with *Model It*.**

- Continue to build the *Shapes* anchor chart by adding the following terms with a definition and illustration: *sphere, cone, cube, cylinder, rectangular prism, edge,* and *face.* Provide illustrations for each group to match to the anchor chart.

Sessions 4 and 5 **Use anytime during these sessions.**

- Ask children to be shape detectives, listening to clues to determine the mystery shape. Select a mystery shape from the *Shapes* anchor chart. Give 3–4 clues to describe the shape. Start with a general clue and get more specific, providing more details with each clue. Have children write down the shape they think is being described after each clue. They can either keep the same answer or change to a new answer after each clue is given. For example, if the mystery word is *square*, possible clues include: *1) The shape is a closed shape. 2) It has 4 sides. 3) The shape has 4 square corners. 4) All of the sides of the shape are the same length. 5) The tile on the floor has this shape.* Reveal the answer and review each clue.

Connect to Language Development

For ELLs, use the Differentiated Instruction chart to plan and prepare for specific activities in every session.

ELL English Language Learners: Differentiated Instruction

Prepare for Session 1
Use with *Try It*.

Levels 1–3

Listening/Speaking Pair children up to sort shapes in ***Try It***. Support children by providing suggested descriptions for the categories they could create, such as *light-colored shapes* and *dark-colored shapes* or *straight sides* and *curved sides*. Encourage children to say the description of the category as they sort each shape. After children have explored the shapes, designate sorting categories, such as: *shapes with 3 points* and *shapes with 4 points,* or *closed shapes* and *open shapes*. Then say: *Choose one shape and describe it to your partner.*

Levels 2–4

Listening/Speaking Pair children up to sort shapes in ***Try It***. Ask: *What is your reason for grouping these shapes together? What do these shapes have in common?* Encourage children to answer in complete sentences. Provide the following sentence starters:

- *I put these shapes together because _____.*
- *The shapes all have _____.*
- *These shapes _____.*

Combine two pairs to form a group of four. Have children take turns choosing two shapes and describing how they are alike or different using the attributes discussed in the sorts.

Levels 3–5

Listening/Speaking Pair children up to sort shapes in ***Try It***. Ask: *What is your reason for grouping these shapes together? What do these shapes have in common?* Encourage children to answer in complete sentences using descriptive terms such as *straight, curved, closed,* and *open*. Combine two pairs to form a group of four. Have each child choose three shapes. Ask children to explain how two of the shapes are alike and how two of the shapes are different. Remind them to use specific language and complete sentences.

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LESSON 33

SESSION 1 Explore

Purpose In this session children sort shapes into groups that have one common attribute and groups that have two common attributes.

Start

Connect to Prior Knowledge

Why Practice recognizing and naming attributes of objects and sorting them in various ways by different attributes.

How Children choose how to sort objects into two groups according to their attributes.

Describe how you could sort these objects into two groups.

Possible Solutions

- basketballs and soccer balls
- orange balls and blue balls
- large balls and small balls

Try It

Materials For each pair: Activity Sheet *Shapes 1*; For display: 2 copies of Activity Sheet *Shapes 1*, tape

Describe Closed and Open Shapes

Display two cards with closed shapes (one with only straight sides and one with both straight and curved sides) and one card with an open shape.

Ask *Which shape does not belong in this group? Why?*

Listen for Children may notice various attributes that describe how one shape is different. Listen for children who identify the open shape being different because not all sides touch.

Discuss how the first two shapes are closed. Relate these shapes to fenced areas where there is no opening for anyone to get in or out. The other shape is open, so anyone could get in or out.

Ask *Can these shapes be sorted other ways?*

Listen for Straight or curved sides. Light or dark colored shapes. Number of corners.

Common Misconception **If** children struggle with understanding closed and open shapes, **then** have them begin drawing a line within the shape. If the line can "escape" through an opening, it is an open shape.

Sort by Open and Closed Shapes

Give each pair of children a set of shape cards. Have pairs sort the shapes and place all the closed shapes in the circle on one partner's workmat in the Student Worktext. The open shapes should be placed on the other partner's workmat.

Draw two circles on the board. Label one circle *Open* and the other *Closed*. Have volunteers use your shape cards and tape shapes to each circle for display.

Ask *Do you agree that all of these shapes are closed shapes? Do you agree that all of these shapes are open shapes? Explain.*

Listen for Children explain how they distinguish between open and closed shapes.

Describe and Sort Shapes by Straight Sides

Draw a third circle on the board and label it *All Straight Sides*. Show a figure that has both straight and curved sides.

Ask *Does this figure belong in this circle?*

Listen for No, because it has some straight sides and some curved sides.

Have children use the second copy of your shape cards and tape figures with only straight sides in the third circle on the board. These may include both open and closed figures with all straight sides.

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Connect It

Materials For display: Activity Sheet *Shapes 1*

Shapes with More Than One Attribute

Scatter all the shapes on the floor or display them on the board.

Ask *Which shapes belong to both the All Straight Sides group and the 4 Corners group?*

Ask *Can shapes in the All Straight Sides group and the 4 Corners group have different sizes and colors and still belong to the group?*

Listen for As long as the shapes have all straight sides and have 4 corners, the size and color do not matter.

You may want to identify all of these shapes as polygons, but don't expect mastery of the term.

Pose a Different Problem

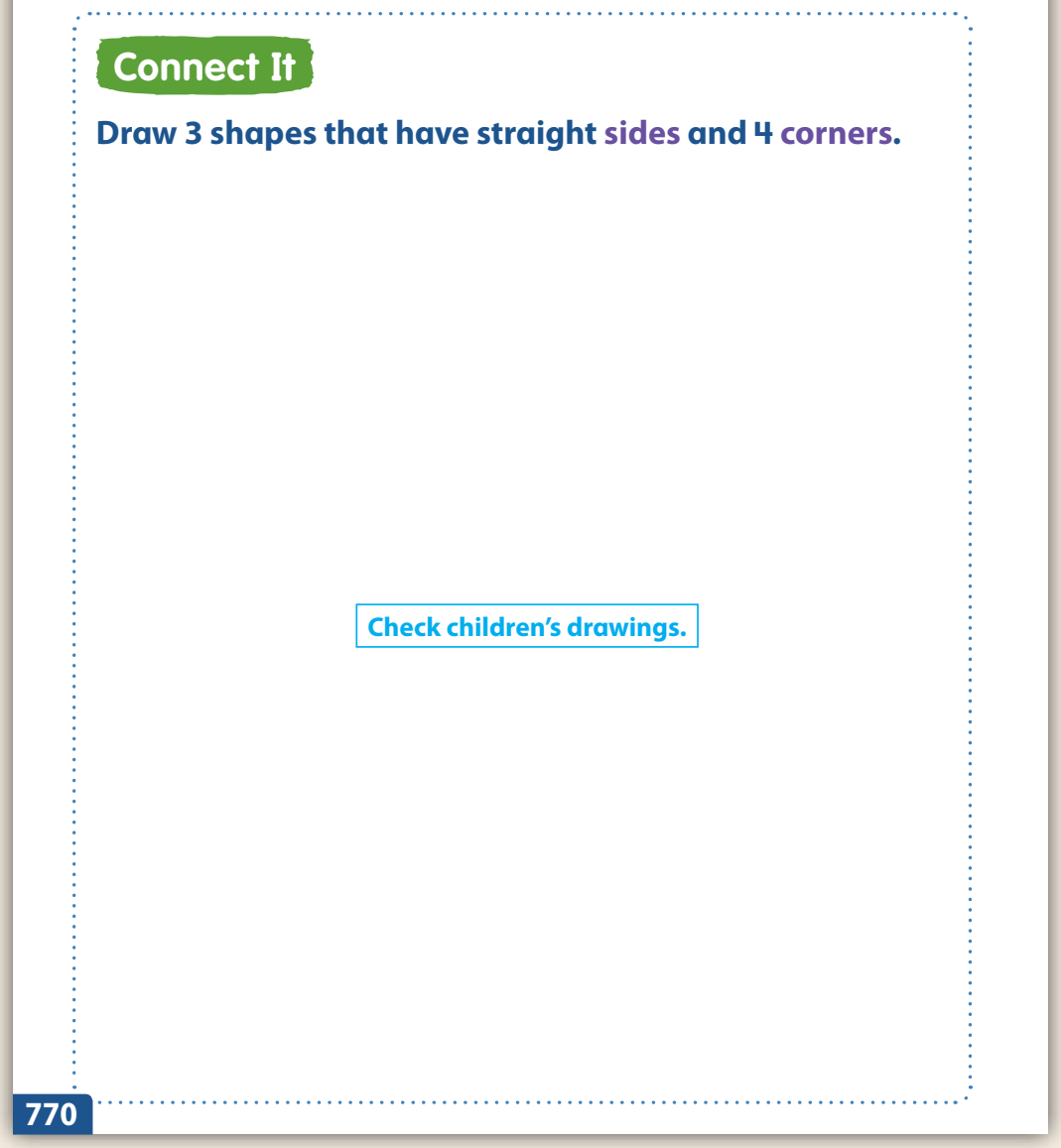
Ask children to draw 3 shapes that have straight sides and 4 corners. Allow children time to draw 3 shapes on the Student Worktext page.

Support Whole Class Discussion

Have volunteers share their drawings with the class.

Ask *How are your drawings like these drawings? How are they different?*

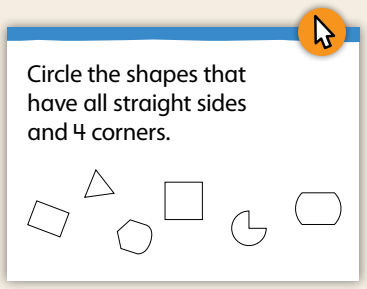
Listen for My shapes also have all straight sides and 4 corners. My shapes are larger/smaller than the other shapes.



Close: Exit Ticket

Materials For each child: copy of printed slide

Children identify shapes that have all straight sides and 4 corners.



Solutions

Children circle the rectangle and the square.

Common Misconception **If** children struggle with choosing which shapes to draw, **then** have them look at the shapes displayed inside the *All Straight Sides* circle. Have them identify which of these shapes also have 4 corners.

Real-World Connection

Encourage children to think about everyday places or situations where people might need to sort groups of things. Have volunteers share their ideas. Examples: sorting coins, sorting blocks, sorting toys.

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Solutions

Support Vocabulary Development

1 Read the directions aloud as children whisper read along with you. Activate prior knowledge by having children turn and tell a partner what a *corner* is. Say: *A corner is a place where two lines, edges, or sides meet. Can anyone show some examples of corners in the classroom?* Encourage children to notice the corners of the room, bookshelves, windows, books, and other objects in the classroom. Ask: *Can someone find an object that does not have corners?* Possible objects without corners are clocks, markers, and cups. Pair children up to complete the graphic organizer.

2 After children circle the corners, have them name the shape and the number of corners using this sentence frame:

The _____ has _____ corners.

Supplemental Math Vocabulary

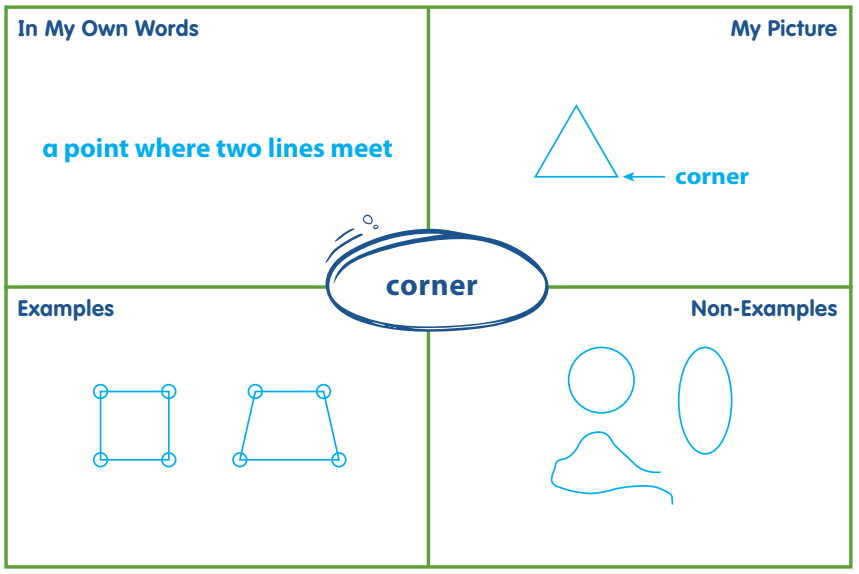
- *face*
- *side*

Name: _____ LESSON 33 SESSION 1

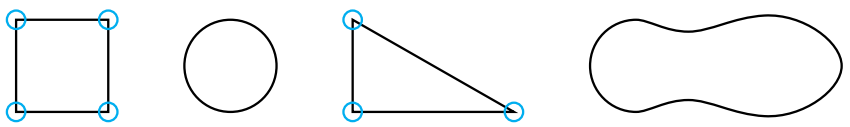
Prepare for Naming and Describing Shapes

1 Think about what you know about the corners of shapes. Fill in each box. Use words, numbers, and pictures. Show as many ideas as you can.

Possible answers:



2 Circle the corners on the shapes.



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3 Assign problem 3 to provide another look at drawing shapes with specific attributes.

This problem is very similar to the problem where children are asked to draw 3 shapes that have straight sides and 4 corners. In both problems, children are given 2 different attributes and are asked to draw 3 shapes that have both attributes. The question asks children to draw 3 shapes that are closed and have straight sides.

Children may want to use pattern blocks, use geoboards, or draw shapes with pencil and paper.

Suggest that children read the problem three times, asking themselves one of the following questions each time:

- *What is this problem about?*
- *What is the question I am trying to answer?*
- *What information is important?*

Solution:

Answers will vary. Check to make sure children draw closed shapes with straight sides.
Medium

3 Solve the problem.

Draw 3 shapes that are closed and have straight sides.

Check children's drawings.

ELL English Language Learners: Differentiated Instruction

Prepare for Session 2
Use with *Model It*.

Levels 1–3

Reading/Writing Support children in small groups as they complete the ***Model It*** problem. Ask children to illustrate vocabulary by drawing a triangle, rectangle, and hexagon in their math journals and naming the shape, labeling at least one side and at least one corner of each shape. If needed, allow children to copy the terms from their Student Worktext as they label.

Levels 2–4

Reading/Writing Pair children up to complete the descriptions in the ***Model It*** problem. Ask children to create a table in their math journals with the headings *Shape, Sides,* and *Corners*. In addition to the shapes presented in the ***Model It*** problem, ask children to include square and rhombus on the table. Have children choose two shapes and write sentences that describe each shape.

Shape	Sides	Corners
▲	3	3

Levels 3–5

Reading/Writing After children complete the ***Model It*** problem, ask them to create a table in their math journals with the headings *Shape, Sides,* and *Corners*. In addition to the shapes presented in the ***Model It*** problem, ask children to include square and rhombus on the table. Have children choose two shapes and write the answers to the questions: *How are the shapes alike? How are they different?*

Shape	Sides	Corners

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LESSON 33

SESSION 2 Develop

Purpose In this session children compare the attributes of two-dimensional shapes. The purpose of this problem is to identify and name triangles, rectangles, and hexagons by the number of sides and the number and types of corners.

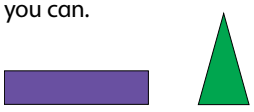
Start

Connect to Prior Knowledge

Why List all attributes describing two-dimensional shapes in order to prime children for focusing on defining attributes.

How List the attributes that children observe about each shape.

Describe these shapes in as many different ways as you can.



Listen for A: purple, 4 square corners, rectangle, closed, all straight sides

B: green, 3 sides, 3 corners, triangle, closed, all straight sides

Develop Language

Why Clarify the meaning of the term *square corners*.

How Draw a square and a rectangle on the board. Trace the corners with your finger and explain that these shapes have *square corners*. Demonstrate how to identify a square corner by placing a standard index card, sticky note, or piece of paper in the shape's corner to see if it is a square corner. For contrast, draw angles that are greater than and less than a right angle on the board and compare the card to those angles to show how they are not square corners.

Try It

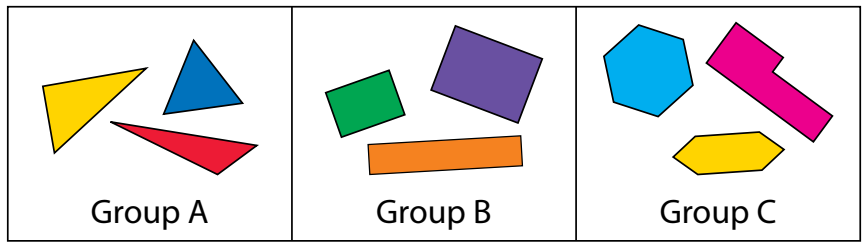
Make Sense of the Problem

Read the problem aloud. To support children in making sense of the problem, prompt them to relate the problem to the previous session.

Ask *How is this problem like the one you did in the previous session? How is it different? Are these shapes like any of the shapes from the previous session? How?*

Develop Naming and Describing Two-Dimensional Shapes

Sophie says the shapes in each group are the same in some way. How are they the same?



Try It

Possible student work:

Sample A

A: all triangles

B: all rectangles

C: all have straight sides

Math Toolkit

• flat shapes

Sample B

Group A:

Group B:

Group C:

DISCUSS IT

What are some ways to sort shapes?

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Discuss It

Support Partner Discussion

Encourage children to use the terms *straight, closed, sides,* and *corners* as they discuss with a partner.

Support as needed with questions such as:

- *Do you know the names of any of these shapes?*
- *Does your partner agree with your reason for how they are the same?*
- *Can you draw another shape that would belong to each group?*

Common Misconception **If** children have difficulty describing common attributes for Group C, **then** ask them what they noticed about the number of sides of the shapes in Groups A and B. Prompt children to count the number of sides of each shape in Group C to determine whether they all have the same number of sides.

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Select and Sequence Solutions

One possible order for whole class discussion:

- describe the shapes in each group as having all straight sides and being closed figures
- name the shapes in Groups A and B: triangles and rectangles
- identify the number of sides of shapes in each group: Group A: 3 sides, Group B: 4 sides, Group C: 6 sides, and name one or more groups as triangles, rectangles, hexagons

Support Whole Class Discussion

Compare and connect the attributes children name. Draw a square on the board.

Ask *Would a square belong in Group A? Group B? Group C? Why?*

Listen for A square belongs in group B because it has 4 sides. A square belongs in group B because it has 4 square corners.

Model It

If no child described the attributes named on the Student Worktext page, connect the descriptions in this table to the children's explanations by having them point out similarities between the vocabulary used in the table and their own descriptions.

Have children complete the descriptions of triangles, rectangles, and hexagons.

Ask *What does it mean for rectangles to have square corners?*

Listen for The corners are like the corners of a square. They are like the corners of a piece of paper.

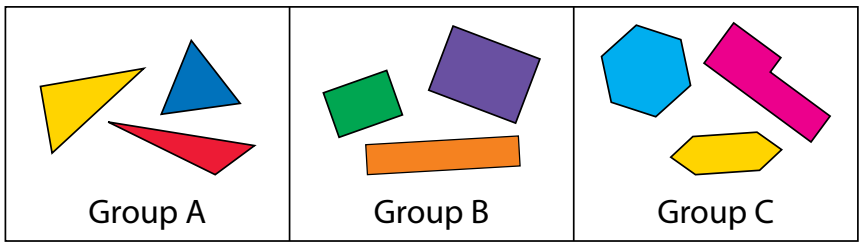
Ask *The triangle, rectangle, and hexagon shown here are all red. Does this make them the same shape?*

Listen for No. Shapes can be any color. The shapes are named by the number of sides or corners.

Ask *What would you say if someone told you that the pink shape can't be a hexagon because it has square corners and the other hexagons do not have square corners?*

Listen for The kind of corners the hexagon has doesn't make a difference. If a shape has 6 sides and 6 corners, it is a hexagon.

Sophie says the shapes in each group are the same in some way. How are they the same?



Model It

The number of sides and corners tells the shape name.

3 sides 3 corners side, corner **triangle**	4 sides 4 square corners **rectangle**	6 sides 6 corners **hexagon**

_____Triangles_____ have 3 sides and 3 corners.

Rectangles have ___4___ sides and ___4___ square corners.

Hexagons have ___6___ sides and ___6___ corners.

Deepen Understanding

Non-Defining Attributes

SMP 6 Attend to precision.

After discussing the attributes that define triangles, rectangles, and hexagons, ask children to explore attributes that a shape may have that do not affect the categorization of the shape.

Draw several triangles of different sizes, angle measures, side lengths, colors, and orientations.

Ask *What are the differences in these shapes?*

Listen for They are different sizes. They are different colors. Some are sitting on a side. Some are sitting on a point. Some have longer or shorter sides.

Ask *How many sides does each of these shapes have?* [3] *How many corners?* [3]

Generalize *Does the color of the shape change the type of shape? Does the size change the name of the shape? Does turning the shape on the page change the shape?* Listen for children's awareness that, in this case, the number of sides and corners are what define and name the shape.

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Connect It

Support Whole Class Discussion

Ask children to look at what they drew or wrote to solve the problem and compare it to the description of the shapes in *Model It*.

1 Help children make sense of the shape descriptions by comparing them to their own description of each group.

Ask *Did you use any of the same words to describe the shapes that are shown in* Model It*?*

Listen for I counted the number of sides on each shape. I counted the number of corners on each shape. I already knew the names of these shapes.

2 **Ask** *How are the shapes within each group different?*

Listen for They are different colors. They are turned differently. Some have long and short sides. As long as they have the same number of sides and the kinds of corners they need to belong to the group, they can have things that make them look different in other ways.

Apply It

Explain that the next problems are an opportunity for children to practice describing the defining attributes of a group of like shapes.

3 They have 4 sides and 4 square corners.
The shapes are rectangles.

Connect It

1 How is your way like **Model It**?
How is it different?

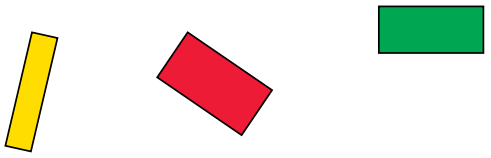
Children may say that they named each group of shapes by the number of sides they have, while Model It also gave each group a name.

2 Why can shapes that have the same name look different?

Possible answer: Shapes with the same name can have different corners or can be bigger or smaller, but they are still the same shape if they match the shape's description.

Apply It

3 Ali says these shapes are the same in some way.
How are they the same?



They have 4 sides and 4 square corners.

The shapes are rectangles.

Hands-On Activity

Describe squares and rhombuses.

For all . . . *children to analyze squares, rectangles, and rhombuses*

Use . . . *the below activity to practice identifying square corners and comparing side lengths.*

Materials For each child: index card, Activity Sheet *Squares, Rectangles, Rhombuses*

- Explain that shapes with 4 sides and 4 corners have different names. Squares and rhombuses both have 4 sides of equal length, but squares must have 4 square corners and rhombuses can have different kinds of corners. Rectangles must have 4 square corners but do not have to have 4 equal sides.
- Give each child an index card. Model how to use the card to check for square corners and how to mark the card with a pencil to compare side lengths.
- Discuss what "opposite sides" means and show children how to look for sides that are facing each other but do not touch. Have them complete Activity Sheet *Squares, Rectangles, and Rhombuses* using the card.

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4 They have 3 sides and 3 corners.
The shapes are triangles.

5 They have 4 sides that are all the same length and 4 corners.

6 0 sides; 0 corners

Support Whole Class Discussion

When children have completed problems 3–6, discuss the answers as a class.

Ask *How are rectangles and squares the same? How are they different?*

Listen for They both have 4 sides and 4 square corners. Squares have 4 equal sides. Rectangles can have 2 longer sides and 2 shorter sides.

Ask *How are the shapes in problem 4 different from each other?*

Listen for Each is a different color. Each is turned in a different way. Each is a different size.

Close: Exit Ticket

Name and/or draw each figure according to its description.

This shape has 4 equal sides and 4 square corners.

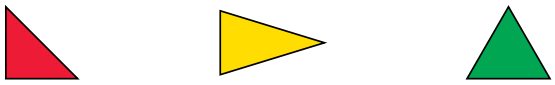
This shape has 3 sides and 3 corners.

This shape has 6 sides and 6 corners.

Solutions
square
triangle
hexagon

Error Alert **If** children struggle with remembering the attributes of the shapes in this lesson, **then** create a chart with children to display in the classroom. The chart can show different examples of each shape with attributes listed. Use color or arrows to visually describe attributes. Children can refer to this chart as they work with shapes in this lesson and upcoming lessons.

4 June says these shapes are the same in some way. How are they the same?



They have 3 sides and 3 corners.

The shapes are triangles.

5 Sammie says these shapes are the same in some way. How are they the same?

square rhombus

They have 4 sides that are all the same length and 4 corners.

6 Describe the **circle**.

0 sides

0 corners

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Solutions

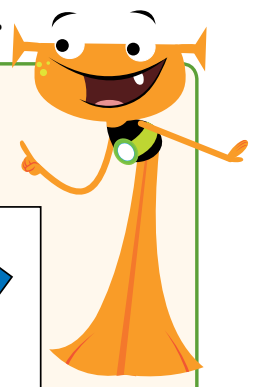
1 rectangle
Basic

2 6 sides;
6 corners;
hexagon
Basic

Name: _____ LESSON 33 SESSION 2

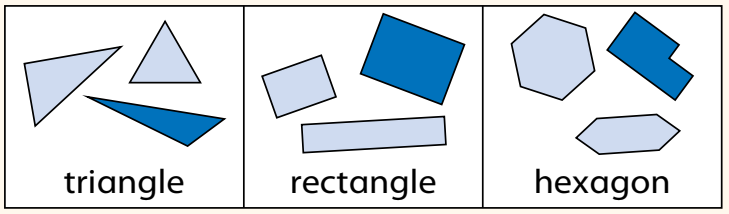
Practice Naming and Describing Shapes

Look at the Example. Then solve problems 1–6.



Example

Here are some shapes you know.

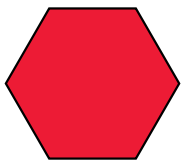


Count sides and corners.
Name the shape.

1 4 sides
4 square corners

rectangle

2 6 sides
6 corners



hexagon

777

Fluency Practice

Identify shapes.

Materials For each child: crayons (red, pink, blue, orange, green), Activity Sheet *Shapes 1* (page 2 only)

Write this key on the board:

triangles: red

hexagons: pink

rectangles: blue

squares: orange

rhombuses: green

- Have children use crayons of each color to mark the corresponding shapes with an X. Tell them that some shapes may not belong to any of the groups listed.
- Have partners share their results and talk about which colors they used to mark some shapes but not others.

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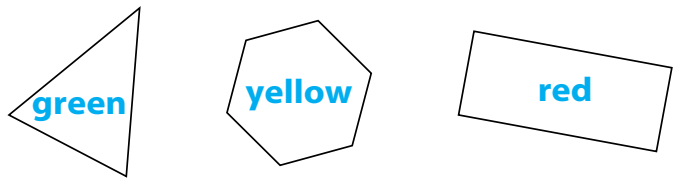
3 triangle: green;
hexagon: yellow;
rectangle: red
Medium

4 The first shape (rectangle) and the last triangle are colored blue.
Medium

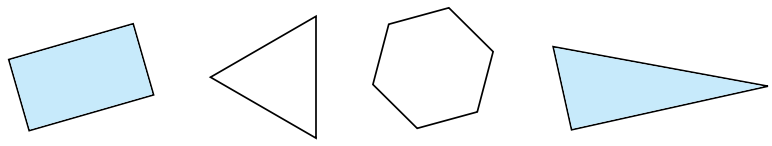
5 Circle the third shape, a hexagon.
Medium

6 These two shapes have square corners and the same number of corners. Circle both descriptions.
Challenge

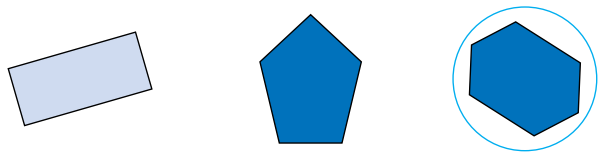
3 Color the triangle green. Color the rectangle red. Color the hexagon yellow.



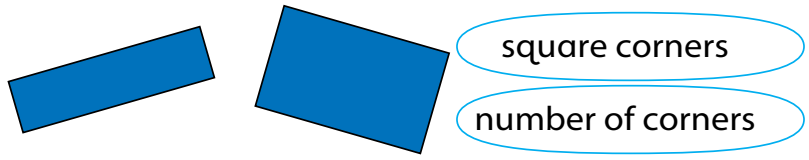
4 Color the shapes with square corners blue.



5 Circle the shape that has 6 sides and 6 corners.



6 What is the same about these two shapes? Circle.



ELL English Language Learners: Differentiated Instruction

Prepare for Session 3
Use with *Try It*.

Levels 1–3

Reading/Writing Support children in small groups as they explore three-dimensional shapes in the ***Try It*** problem. Ask children to illustrate vocabulary by trying their best to draw a cone, rectangular prism, cube, cylinder, and sphere in their math journals and writing the name of the shape. Encourage children to choose a shape that has an edge and label it. Then have them choose a shape that has a face and label it. If needed, allow children to copy the terms from their Student Worktext as they label.

Levels 2–4

Reading/Writing Pair children up to compare and contrast the three-dimensional shapes in the ***Try It*** problem. Ask children to create a table in their math journals with the headings *Shape, Faces,* and *Edges.* Have children choose 2 shapes and write a sentence describing each one. Provide a sentence frame: *A* _____ *has* _____.

Shape	Faces	Edges
	2	X

Levels 3–5

Reading/Writing Pair children up to compare and contrast the three-dimensional shapes in the ***Try It*** problem. Ask children to create a table in their math journals with the headings *Shape, Faces, Edges,* and *Corners*. Have children choose 2 shapes to compare and contrast and respond in writing to the questions: *How are the shapes alike? How are they different?*

Shape	Faces	Edges	Corners
	2	X	

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LESSON 33

SESSION 3 Develop

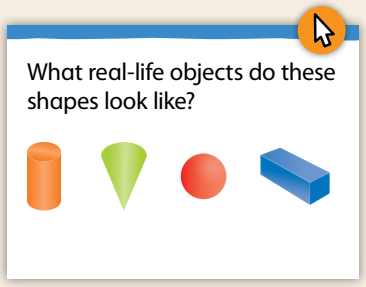
Purpose In this session children compare attributes of three-dimensional figures. The purpose is to identify defining attributes as they examine cones, rectangular prisms, cubes, cylinders, and spheres and connect flat faces to two-dimensional shapes they know.

Start

Connect to Prior Knowledge

Why Connect three-dimensional figures to familiar objects in children's lives.

How Name everyday objects that can be modeled with three-dimensional figures.



Possible Solutions
Can of beans
Ice cream cone
Soccer ball
Shoebox

Develop Language

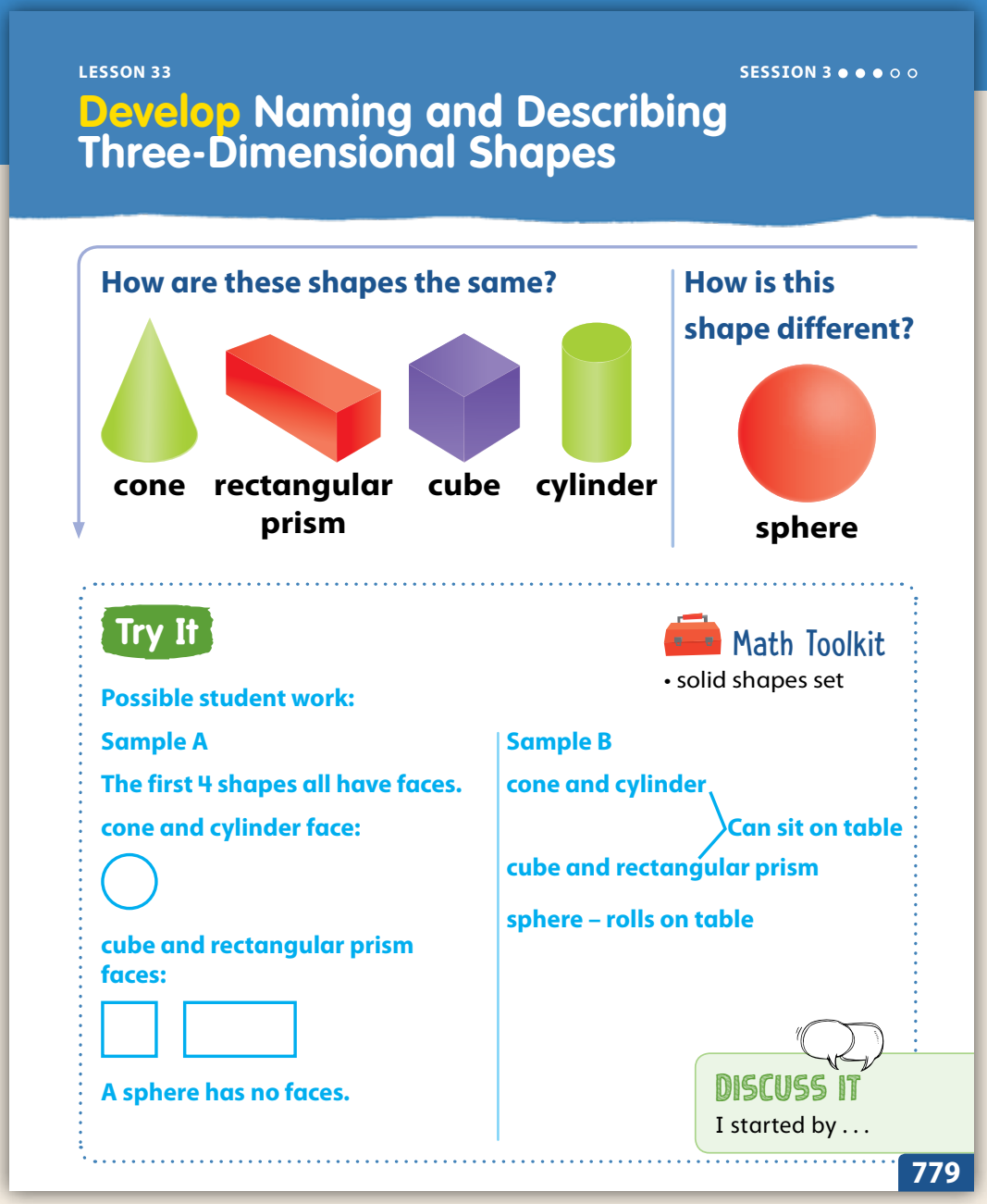
Why Support children as they talk about shapes.

How Display the phrases *circle faces, straight edges,* and *square corners*. Use gestures or drawings to illustrate each phrase. Pair children up and encourage them to take turns describing cones, rectangular prisms, cubes, cylinders, and spheres with the phrases.

Try It

Make Sense of the Problem

Read the problem aloud. To support children in making sense of the problem, prompt them to examine each figure and notice things about them.



Ask *Do these figures have anything in common with each other?*

Discuss It

Support Partner Discussion

Encourage children to share their observations with their partner.

Support as needed with questions such as:

- *What is familiar about these shapes?*
- *Which two shapes are alike in some way?*
- *Are these shapes like any real-world objects you have seen?*

Common Misconception **If** children identify these three-dimensional objects with two-dimensional shape names, **then** point out that the shapes you worked with in the last session were flat shapes. You can see shapes like squares, rectangles, and circles on parts of these three-dimensional objects, but there is more to the three-dimensional objects. These are objects you can hold in your hand.

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Select and Sequence Solutions

One possible order for whole class discussion:

- shapes that can roll and shapes that cannot roll
- shapes that have at least one flat face and a shape that has no flat faces
- cube and rectangular prism sit on a square and rectangle face and cannot roll; cone and cylinder sit on a circle face but also have a rolling surface; sphere doesn't have any faces

Support Whole Class Discussion

Compare and connect different descriptions of the three-dimensional figures.

Ask *How are these figures like the shapes you saw in the previous session? How are they different?*

Listen for Some have sides and corners. You can see squares, rectangles, and circles on some parts of these shapes. These figures aren't flat.

Model It

If no child used the descriptive words used in *Model It*, take the time to allow children to hold each object as you point to each face and edge.

Ask *A cube has 6 faces. How would you explain what a face is?*

Listen for A face is a flat shape that you can use to build a shape you can hold. A face is a flat part that you can set on a surface and it doesn't roll.

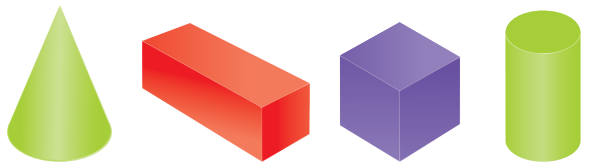
Ask *How can you describe a straight edge on a rectangular prism?*

Listen for A straight edge is where two faces meet and touch. You can trace your finger along an edge and it goes in a straight line. An edge feels like a corner.

Ask *Does a sphere have any faces?*

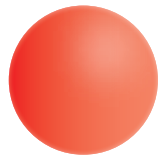
Listen for No, a sphere has no flat parts.

How are these shapes the same?



cone | rectangular prism | cube | cylinder

How is this shape different?



sphere

Model It

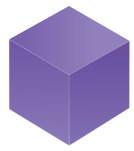
Make a ✓ if true. Make an X if not true.

A cylinder has:

✓ 2 circle **faces**

X 2 straight **edges**

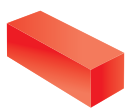
A cube has:



X 0 straight edges

✓ 6 square faces

A cone has 1 circle ___face___.



A rectangular prism has ___6___ faces.

A sphere has ___0___ faces.

Deepen Understanding
Three-Dimensional Figures

SMP 5 Use tools.

Two-dimensional figures have *sides* but three-dimensional figures have *edges*. Three-dimensional figures have some *faces* that can be described using two-dimensional shape names.

Materials For each pair or small group: geometric solid shapes

Guide children to set the flat face of a shape on paper and have one child hold it while another child traces the outline of the face. Have children take turns tracing the faces of all the shapes and then label the shapes they traced.

Ask *Which different flat shapes did you trace for each three-dimensional shape?*

Listen for Rectangular prism: square and rectangle; cube: square; cylinder: circles; cone: circle; sphere: no faces to trace.

Generalize *How could you sort these three-dimensional figures into different categories?* Listen for children to describe categories: figures that roll and figures that don't roll; figures with rectangle faces and figures with circle faces; 1 face, 2 faces, no faces.

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Connect It

Support Whole Class Discussion

Ask children to look at how they described these figures and compare it to the descriptions in *Model It*.

1. Help children connect what they wrote to the words used in *Model It*.

   Ask *Did you notice the faces and edges on the shapes? Did you call them something else?*

2. **Ask** *How do you know whether Boom can make a cube with 6 faces? How do you know whether Buzz can make a sphere with 2 faces?*

   Listen for A cube has 6 square flat faces, so Boom can make a cube. A sphere rolls and has no flat faces, so Buzz cannot make a sphere with 2 faces.

Apply It

Explain that the next problems are an opportunity for children to practice describing these three-dimensional figures.

Make geometric solid shapes (or everyday examples of a cube, cone, cylinder, rectangular prism, and sphere) available.

3. A rectangular prism has 12 straight edges and cannot roll.

   A rectangular prism does not have 6 corners; it has 8 corners.

   A rectangular prism does not have 4 square faces; it has 6 faces.

   A cone has 0 sides.

   A cone has 0 straight edges.

   A cone has 1 circle face.

   A cone does not have 1 triangle face.

Connect It

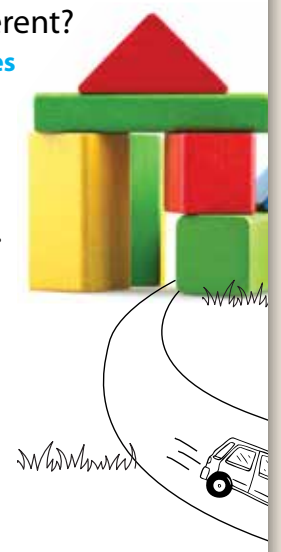
1. How is your way like **Model It**? How is it different?

   Children may say that they noticed that all the shapes except the sphere can sit flat on the table. Model It also calls the flat parts of the shapes "faces."

2. Boom says he can make a cube with 6 faces.
   Buzz says he can make a sphere with 2 faces.

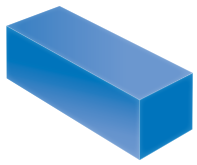
   Who is right? How do you know?

   Possible answer: Boom is right because a cube has 6 faces. A sphere has no faces.



Apply It

3. Make a ✓ if true. Make an X if not true.



Describe this rectangular prism.

___✓___ 12 straight edges
___X___ 6 corners
___X___ 4 square faces
___✓___ cannot roll

Describe this cone.

___✓___ 0 sides
___✓___ 0 straight edges
___✓___ 1 circle face
___X___ 1 triangle face

781

Hands-On Activity

Three-Dimensional Shapes Rhyme.

If . . . *children are unsure about the names of the three-dimensional figures introduced in this lesson*

Then . . . *have them fill in the blanks and use this rhyme to help them connect the shapes to known objects.*

Materials For each child: Activity Sheet *3-Dimensional Shapes Rhyme;* For display: geometric solid shapes

Hand out Activity Sheet *3-Dimensional Shapes Rhyme* to children and have them fill in the blanks with shape names from the word bank at the top of the page. Recite the poem chorally several times. Have volunteers hold up the geometric shapes as they are named.

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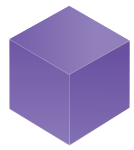
4 Describe this cube. Make a ✓ if true.
Make an X if not true.

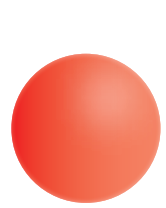


✓ 6 faces
✓ 8 corners
X 10 edges
X can roll

5 Describe this cylinder. Make a ✓ if true.
Make an X if not true.

✓ 2 circle faces
X 6 corners
✓ 0 straight edges
✓ can roll

6 Describe this sphere. Make a ✓ if true.
Make an X if not true.



✓ 0 edges
✓ 0 corners
X 2 faces
✓ can roll

4 A cube has 6 faces and has 8 corners.
A cube does not have 10 edges, and it is not true that it can roll.

5 A cylinder has 2 circle faces, 0 straight edges, and can roll.
A cylinder does not have 6 corners.

6 A sphere has 0 edges, 0 corners, and can roll.
A sphere does not have 2 faces.

Support Whole Class Discussion

When children have completed problems 3–6, discuss the answers as a class.

Ask *Can you sort these shapes into categories?*

Listen for Cylinders and cones can be in a "circle face" category. Cubes and rectangular prisms can be in a "faces with all straight sides" category. Spheres, cylinders, and cones can be in a "rolling shapes" category.

Close: Exit Ticket

Materials For display: a cube and a rectangular prism

Tell children to put a check mark next to the true statements and write an X next to the statements that are not true for each shape.

A cube
___ has 6 square faces.
___ has 8 edges.
___ sits flat on a table.

A rectangular prism
___ has 6 square faces.
___ has 12 edges.
___ sits flat on a table.

Listen for A cube has 6 square faces and sits flat. It does not have 8 edges.

A rectangular prism has 12 edges and sits flat. It does not have 6 square faces.

Error Alert **If** children struggle with understanding why the "box shape" is called a rectangular prism, **then** have them hold the rectangular prism and describe each of its faces. Some of the faces are rectangles (as opposed to 6 square faces that make up a cube), so the shape is called a rectangular prism.

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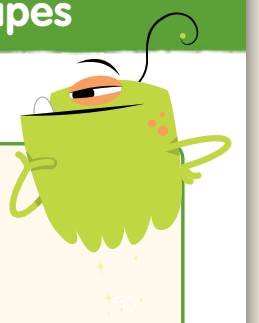
Solutions

1. True: 12 edges
   Not true: all edges the same length, 7 corners
   Basic

2. True: 2 circle faces, can roll, 0 corners
   Basic

Name: _____ LESSON 33 SESSION 3

Practice Naming and Describing Shapes

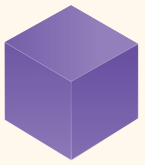


Look at the Example. Then solve problems 1–5.

Example

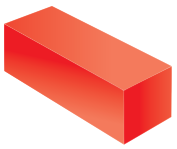
Make a ✓ if true.
Make an X if not true.

→ Describe this cube.



✓ 12 edges
X 7 corners
✓ all edges the same length

1. Describe this rectangular prism.



✓ 12 edges
X all edges the same length
X 7 corners

2. Describe this cylinder.

✓ 2 circle faces
✓ can roll
✓ 0 corners

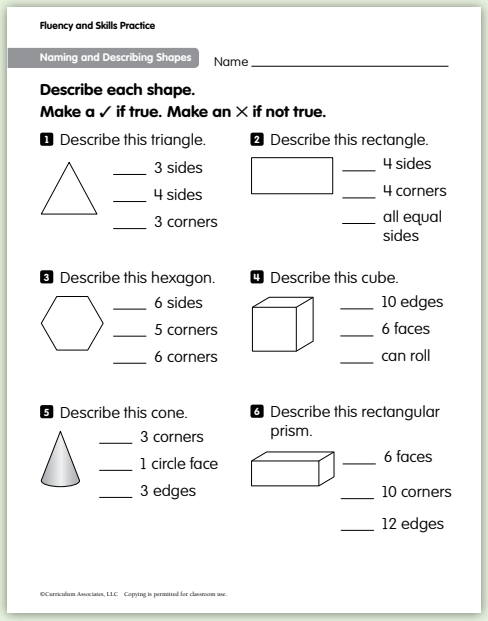
783

Fluency & Skills Practice

Teacher Toolbox

Assign *Naming and Describing Shapes*

In this activity children practice describing two- and three-dimensional shapes. Children should be able to recognize real-world examples of each shape. For example, children may notice that a party hat has the same attributes as a cone. Children may also be given directions that include the names of shapes. For example, a friend may tell them to ride their bike to the street sign shaped like a triangle.



Fluency and Skills Practice

Naming and Describing Shapes Name _____

Describe each shape.
Make a ✓ if true. Make an × if not true.

1. Describe this triangle.
   ___ 3 sides
   ___ 4 sides
   ___ 3 corners

2. Describe this rectangle.
   ___ 4 sides
   ___ 4 corners
   ___ all equal sides

3. Describe this hexagon.
   ___ 6 sides
   ___ 5 corners
   ___ 6 corners

4. Describe this cube.
   ___ 10 edges
   ___ 6 faces
   ___ can roll

5. Describe this cone.
   ___ 3 corners
   ___ 1 circle face
   ___ 3 edges

6. Describe this rectangular prism.
   ___ 6 faces
   ___ 10 corners
   ___ 12 edges

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3 True: 1 circle face, can roll
Not true: 3 corners
Medium

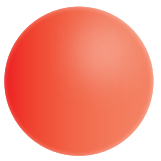
4 True: 0 edges, 0 corners
Not true: cannot roll
Medium

5 **A, B, D**; A cube and a prism both have 12 edges, 8 corners, and 6 faces.
The faces of the cube are all squares, but some faces of the rectangular prism are rectangles.
Challenge

3 Describe this cone.

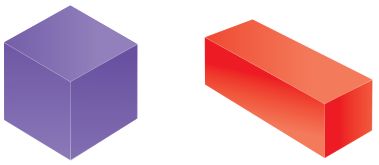
✓ 1 circle face
X 3 corners
✓ can roll

4 Describe this sphere.



✓ 0 edges
✓ 0 corners
X cannot roll

5 Look at these shapes.



Circle all the ways they are alike.

Ⓐ 12 edges

Ⓑ 8 corners

Ⓒ all square faces

Ⓓ 6 faces

ELL English Language Learners: Differentiated Instruction

Prepare for Session 4
Use with *Apply It*.

Levels 1–3

Listening/Speaking Have children work in groups of three to discuss the shapes in ***Apply It*** problem 1. Provide the sentence frame:

- _____ *have* _____ *sides and* _____ *corners*.

Ask children to take turns choosing a shape and completing the sentence. Have children check their shape drawings by counting the number of sides and corners as each sentence is completed.

Levels 2–4

Listening/Speaking Pair children up to discuss the shapes in ***Apply It*** problem 1. Have children take turns choosing a shape and describing it in a complete sentence. Encourage children to describe the number of sides and corners of each shape. If children need additional support, have them use the tables they created in their math journals as a resource.

Levels 3–5

Listening/Speaking Pair children up to discuss the shapes in ***Apply It*** problem 1. Have children take turns choosing two different shapes and describing how they are alike or different. Provide a word bank with the terms *sides, corners, open,* and *closed*. Encourage children to use at least one of the terms from the bank as they describe the similarities and differences in complete sentences.

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LESSON 33

SESSION 4 Refine

Purpose In this session children practice drawing and identifying two-dimensional shapes and naming three-dimensional shapes by examining their attributes.

Start

Develop Fluency

Why Associate two-dimensional shape names with the number of sides each has.

How Name the number of sides in each figure listed.

How many sides?

rectangle ____
hexagon ____
square ____
rhombus ____
triangle ____

Solutions
rectangle: 4 sides
hexagon: 6 sides
square: 4 sides
rhombus: 4 sides
triangle: 3 sides

Example

Read the Example problem aloud and have children describe what they know about these shapes.

Ask *What is the same about all of these shapes? What is different?*

Listen for They all have 4 straight sides and 4 corners. Rhombus and square have 4 equal sides. Square and rectangle have 4 square corners. The rectangle has 2 pairs of same-length sides.

Apply It

1. 2 triangles colored red, 2 hexagons colored pink, 2 rectangles colored blue, 2 rhombuses colored green.
DOK 1

2. No; This shape is not a rectangle because it does not have 4 square corners.
DOK 3

LESSON 33 SESSION 4

Refine Naming and Describing Shapes

Complete the Example. Then solve problems 1–5.

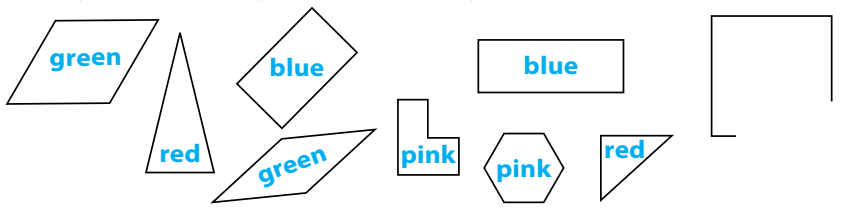
Example Draw the shape named in each box.

rhombus	rectangle	square

Apply It

1. Color the shapes.

triangles ■ hexagons ■ rectangles ■ rhombuses ■



2. Boom says this shape is a rectangle.

Do you agree? Why or why not?

No; Possible answer: The shape is not a rectangle because it doesn't have 4 square corners.

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3 Children draw a closed 6-sided figure, a closed 4-sided figure with square corners, and a closed 3-sided figure.
DOK 2

4 4 cubes colored blue, 3 cylinders colored green, 2 rectangular prisms colored red.
DOK 1

5 Two squares are circled.
DOK 1

Close: Exit Ticket

Check for Understanding

Materials For remediation: geometric solid shapes

Ask children to draw the shape of a face that each of these three-dimensional figures has.

Draw the shape of a face for each of these figures.

cylinder cube

cone

rectangular prism

Solution
cylinder: circle
cube: square
cone: circle
rectangular prism: rectangle or square

Error Alert For children who are still struggling, use the table on the right to guide remediation.

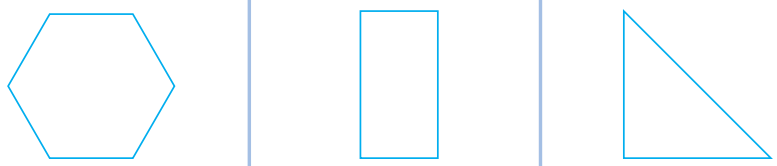
After providing remediation, check children's understanding of the following problem:

Draw a face of a cube.

Draw a face of a cylinder.

3 Draw each shape.

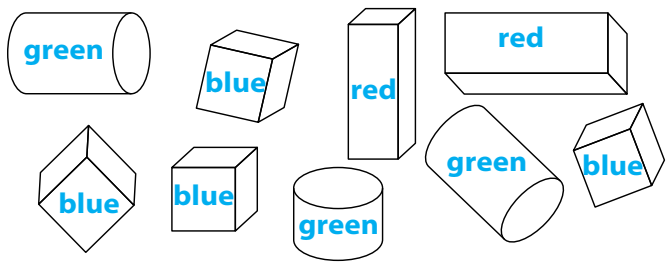
Possible answers:



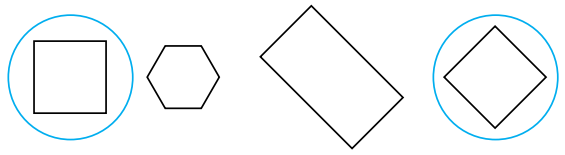
hexagon rectangle triangle

4 Color the shapes.

rectangular prisms ■ cubes ■ cylinders ■



5 Circle the squares.



Error Alert

If the error is . . .	*Children may . . .*	*To support understanding . . .*
drawing the three-dimensional figure	not understand that a face is a flat shape of a three-dimensional figure.	Show children a model of the three-dimensional figure and ask them to trace one of the flat faces. Ask them what shape they have made.
drawing a rectangle face for the cylinder	be visualizing the flat rectangle face that is the rolling surface of the cylinder.	Show children a model of a cylinder and ask them to identify the part that is flat and will not roll. Have them trace the circle on either end.
drawing a rectangle for the cylinder or triangle for the cone	see the drawing of a solid figure as a flat object.	Allow children to handle geometric solid figures and view them from different angles.

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Solutions

1. Children draw shapes with these attributes:
rhombus: 4 equal sides;
square: 4 equal sides and 4 square corners;
hexagon: 6 sides
Medium

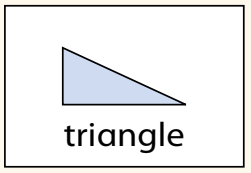
2. 3 triangles are colored yellow, 1 rhombus is colored green, 1 rectangle is colored red, and 2 hexagons are colored blue.
Circle and open shape are not colored.
Medium

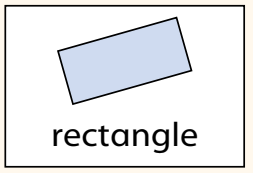
Name: _____ LESSON 33 SESSION 4

Practice Naming and Describing Shapes

Look at the Example. Then solve problems 1–5.

Example Draw each shape.

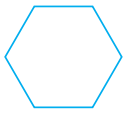

triangle


rectangle

1. Draw each shape.
Possible answers:

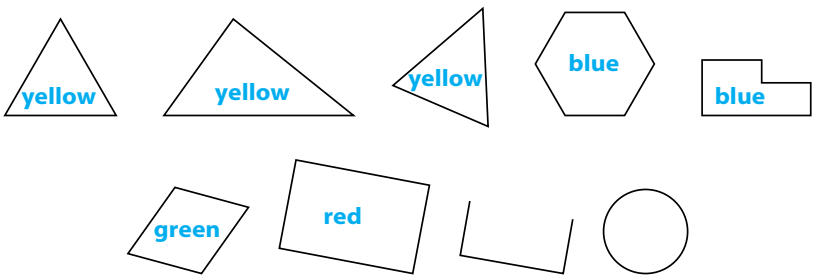
rhombus

square


hexagon

2. Color the shapes.

triangles ■ rhombuses ■ rectangles ■ hexagons ■



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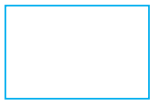
3 Children draw shapes with these attributes: rectangle: 4 sides and 4 square corners; triangle: 3 sides and 3 corners
Medium

4 Children circle the first shape and the third shape, which both have 6 sides.
Medium

5 2 cones are colored blue, 4 cubes are colored red, and 3 rectangular prisms are colored green.
Challenge

3 Draw each shape.

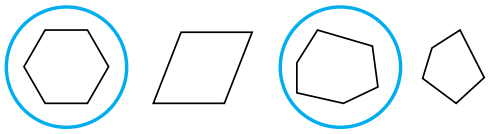
Possible answers:



rectangle

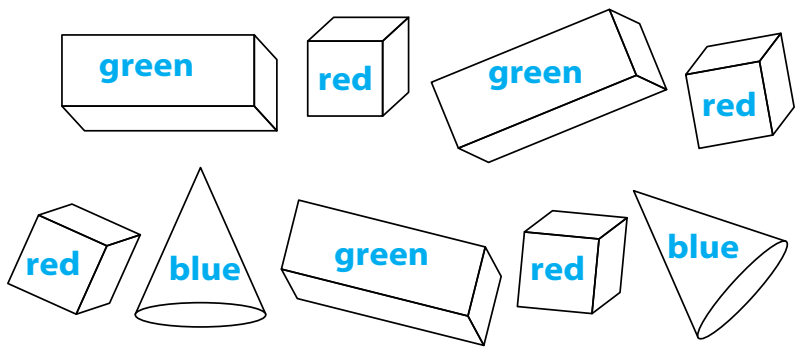
triangle

4 Circle the hexagons.



5 Color the shapes.

rectangular prisms ■ cubes ■ cones ■



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LESSON 33

SESSION 5 Refine

Purpose In this session children practice describing attributes of two-dimensional and three-dimensional shapes.

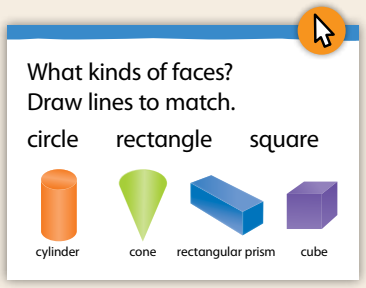
Start

Develop Fluency

Materials For each child: copy of printed slide

Why Build understanding of attributes of three-dimensional figures by examining the shapes of their faces.

How Draw line(s) from each three-dimensional figure to the word or words that describe its faces.



Possible Solutions
cylinder: circle
cone: circle
rectangular prism: rectangle, square
cube: square

Apply It

1. Children choose one of the shapes listed and draw 3 examples. Shapes should have all of the correct attributes but can be different sizes or can be oriented differently.
DOK 2

2. Children describe the shapes' common attributes as well as how they are different (for example: sizes, angles, orientation).
DOK 3

3. **A, C**; A rectangle has 4 sides and 4 square corners.
DOK 2

4. **A, B, D**; A cube has 12 edges, all square faces, and 8 corners.
DOK 2

5. Children draw a rhombus (4 equal sides), a triangle (3 sides), and a hexagon (6 sides).
DOK 2

Refine Naming and Describing Shapes

Apply It

Solve problems 1–5.

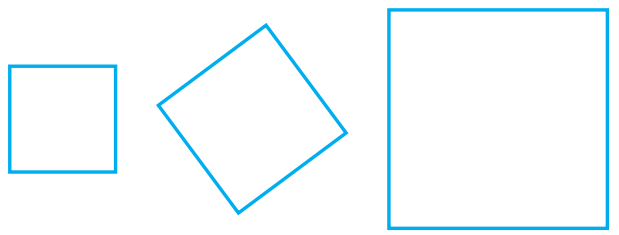
1. Make the same shape in different ways.

Choose a shape to draw. Circle its name.
Answers will vary.

hexagon	triangle	rectangle
rhombus	(square)	

Draw your shape 3 different ways.

Possible answer:



2. How are your shapes different? How are they alike?

Possible answer: They all have 4 equal sides and 4 square corners. The squares are different sizes and one is turned.

Differentiated Instruction

RETEACH

Hands-On Activity

Classify shapes by name.

Children struggling with names and attributes of two-dimensional figures

Will benefit from additional work with classifying shapes.

Materials For each pair: 3-foot length of string, Activity Sheet *Shapes 1*

- Have pairs make a circle with the string, lay shape cards faceup, and stack attribute cards facedown.
- Children turn over an attribute card, set it next to the circle, and take turns selecting each of the shape cards. Shapes that match the attribute card get placed in the circle. Shapes that do not match are set aside.
- After sorting the cards, children discuss why some belong in the circle and others do not. Then they remove all shapes, select a different attribute card, and repeat.

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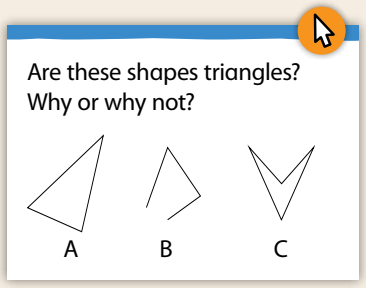
Close: Exit Ticket

Math Journal

Are these shapes triangles? Why or why not?



Possible Solutions

Shape A: Yes, it is a triangle because it has 3 sides and 3 corners.

Shape B: No, because it is not a closed shape.

Shape C: No, because it has 4 sides.

Error Alert **If** children struggle with distinguishing between defining and non-defining attributes, **then** help them see why a description statement that seems accurate (such as "It is bigger than a square") might not always be true: show a rectangle that is smaller than a square as a counterexample.

3 Circle all the reasons this shape is a rectangle.

Ⓐ It has 4 sides.

Ⓑ It is bigger than a square.

Ⓒ It has 4 square corners.

Ⓓ It is red.

4 Circle all the reasons this shape is a cube.

Ⓐ It has 12 edges.

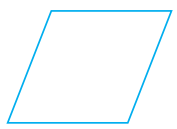
Ⓑ It has all square faces.

Ⓒ It is purple.

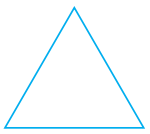
Ⓓ It has 8 corners.

5 Draw each shape.

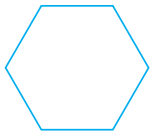
Possible answers:



rhombus



triangle



hexagon

EXTEND

Challenge Activity

Visualize a shape based on a description.

Children who have achieved proficiency

Will benefit from deepening understanding of two-dimensional shapes.

Materials For each child: whiteboard and marker

- Children work in pairs. One partner draws a two-dimensional shape and keeps it hidden from the other partner. He or she describes its attributes orally without naming the shape.
- The other partner draws a shape or shapes that fit the description given.
- When finished, partners reveal their whiteboards to compare their shapes and decide whether the second partner drew something that is consistent with the first partner's verbal description, even if it looks different.
- Challenge partners as they take turns being the describer and being the drawer to give more detailed clues about number of sides, lengths of sides, types of corners, etc.
- Listen for partners who recognize that some descriptions can yield different-looking shapes that have the stated attributes.

PERSONALIZE

i-Ready

Provide children with opportunities to work on their personalized instruction path with *i-Ready* Online Instruction to:

- fill prerequisite gaps
- build up grade-level skills

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Lesson Overview

LESSON 34

Putting Shapes Together

Lesson Objectives

Content Objectives

- Compose two-dimensional shapes to create composite shapes, and then compose new shapes from the composite shape.
- Compose three-dimensional shapes to create composite shapes and analyze the parts of a composite shape.

Language Objectives

- Use pattern blocks to create composite shapes.
- Draw two-dimensional composite shapes using given smaller shapes.
- Use connecting cubes to create composite shapes.
- Name the shapes contained in a composite three-dimensional shape.

Prerequisite Skills

- Identify and describe squares, circles, triangles, rectangles, hexagons, and rhombuses.
- Identify cubes, rectangular prisms, cylinders, and cones.

Standards for Mathematical Practice (SMP)

SMPs 1, 2, 3, 4, 5, and 6 are integrated in every lesson through the *Try-Discuss-Connect* routine.*

In addition, this lesson particularly emphasizes the following SMPs:

4 Model with mathematics.

5 Use appropriate tools strategically.

7 Look for and make use of structure.

*See page 431i to see how every lesson includes these SMPs.

Lesson Vocabulary

- **trapezoid (exclusive)** a flat shape with 4 sides, where exactly 1 pair of sides never meet.*
- **trapezoid (inclusive)** a flat shape with 4 sides, where at least 1 pair of sides never meet.*

Review the following key terms.

- **hexagon** a flat shape with 6 straight sides and 6 corners.
- **rectangle** a flat shape with 4 sides and 4 square corners. The opposite sides have the same length.
- **rhombus** a flat shape with 4 sides and 4 corners. All sides have the same length.
- **side** a line that makes part of a flat shape.
- **square** a flat shape with 4 straight sides of equal length and 4 square corners.
- **triangle** a flat shape with 3 straight sides and 3 corners.

*Ready Classroom uses the inclusive, not exclusive, definition of trapezoid. Grade 1 children should not be held responsible for definitions.

Learning Progression

In Kindergarten children compose shapes to build pictures and designs.

In Grade 1 children compose and decompose different shapes, building an understanding of part-whole relationships.

In this lesson children put together two or more shapes to create a composite shape. They learn to perceive a combination of shapes as a single new shape. As a result, children begin to notice shapes within an already existing shape. These ideas are extended in the next lesson, in which children break circles and squares into two or four equal parts.

In Grade 2 children continue to partition circles and squares into two and four equal parts. They also extend the concept to rectangles and three equal parts.

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Lesson Pacing Guide

Whole Class Instruction

SESSION 1
Explore
45–60 min

Interactive Tutorial* *(Optional)*
Prerequisite Review: Understand Attributes of Shapes

Putting Shapes Together
- Start *5 min*
- Try It *20 min*
- Connect It *15 min*
- Close: Exit Ticket *5 min*

Additional Practice
Lesson pages 795–796

SESSION 2
Develop
45–60 min

Putting Shapes Together
- Start *5 min*
- Try It *15 min*
- Discuss It *10 min*
- Model It *5 min*
- Connect It *10 min*
- Apply It *5 min*
- Close: Exit Ticket *5 min*

Additional Practice
Lesson pages 801–802

Fluency Practice
Practice Addition

SESSION 3
Develop
45–60 min

Putting Shapes Together
- Start *5 min*
- Try It *15 min*
- Discuss It *10 min*
- Model It *5 min*
- Connect It *10 min*
- Apply It *5 min*
- Close: Exit Ticket *5 min*

Additional Practice
Lesson pages 807–808

Fluency
Putting Shapes Together

SESSION 4

Putting Shapes Together
- Start *5 min*
- Example and Apply It *10 min*
- Close: Exit Ticket *5 min*

Additional Practice
Lesson pages 811–812

Lesson Quiz or **Digital Comprehension Check**

SESSION 5
Refine
45–60 min

Putting Shapes Together
- Apply It and Small Group Differentiation *20 min*
- Close: Exit Ticket *5 min*

Lesson Materials

Lesson *(Required)*	*Per child:* pattern blocks, 1 set of tangram shapes, copy of Start slide (Session 1), copy of Close slide (Session 1) *Per group:* geometric solids (or everyday examples of cube, cone, cylinder, rectangular prism) *For display:* geometric solids *Activity Sheet:* Tangram Shapes
Activities	*Per child:* pattern blocks, 1 set of tangram shapes, tangram pictures *For display:* 10 square pattern blocks, 10 number cubes, 10 identical toy blocks or other cubes *Activity Sheets:* Addition Practice 4, Pattern Blocks 2, Tangram Shapes
Math Toolkit	geometric solids, pattern blocks, connecting cubes

*We continually update the Interactive Tutorials. Check the Teacher Toolbox for the most up-to-date offerings for this lesson.

Teacher Toolbox

Small Group Differentiation

PREPARE

Ready Prerequisite Lessons

Grade K
- Lesson 14 Compare Shapes
- Lesson 15 Build Shapes

RETEACH

Tools for Instruction

Grade K
- Lesson 14 Describing and Comparing Shapes by Attributes
- Lesson 15 Build Shapes

Grade 1
- Lesson 34 Making New Shapes

REINFORCE

Math Center Activities

Grade 1
- Lesson 34 Shape Match
- Lesson 34 Put Shapes Together

EXTEND

Enrichment Activity

Grade 1
- Lesson 34 Shapes!

i-Ready

Independent Learning

PERSONALIZE

i-Ready Lesson*

Grade 1
- Practice: Attributes of Shapes

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Connect to Family, Community, and Language Development

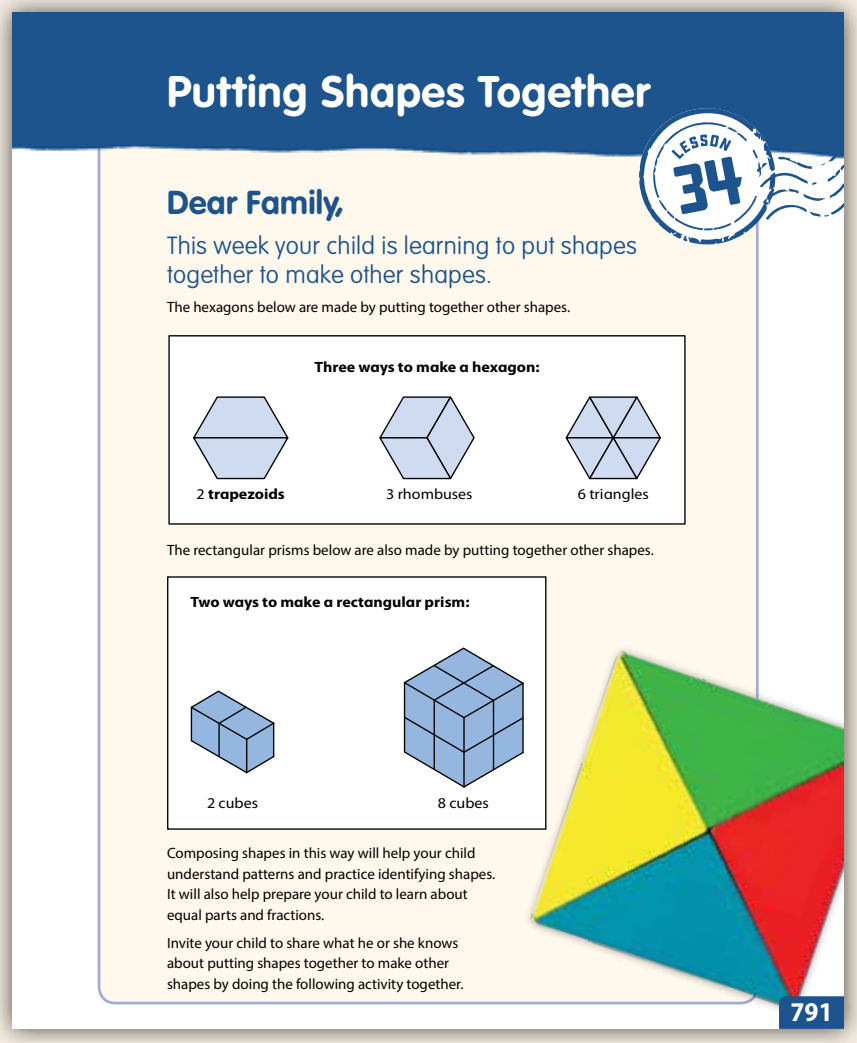
The following activities and instructional supports provide opportunities to foster school, family, and community involvement and partnerships.

Connect to Family

Use the **Family Letter**—which provides background information, math vocabulary, and an activity—to keep families apprised of what their child is learning and to encourage family involvement.

Available in Spanish

Teacher Toolbox



Putting Shapes Together

LESSON 34

Dear Family,

This week your child is learning to put shapes together to make other shapes.

The hexagons below are made by putting together other shapes.

Three ways to make a hexagon:

2 **trapezoids** | 3 rhombuses | 6 triangles

The rectangular prisms below are also made by putting together other shapes.

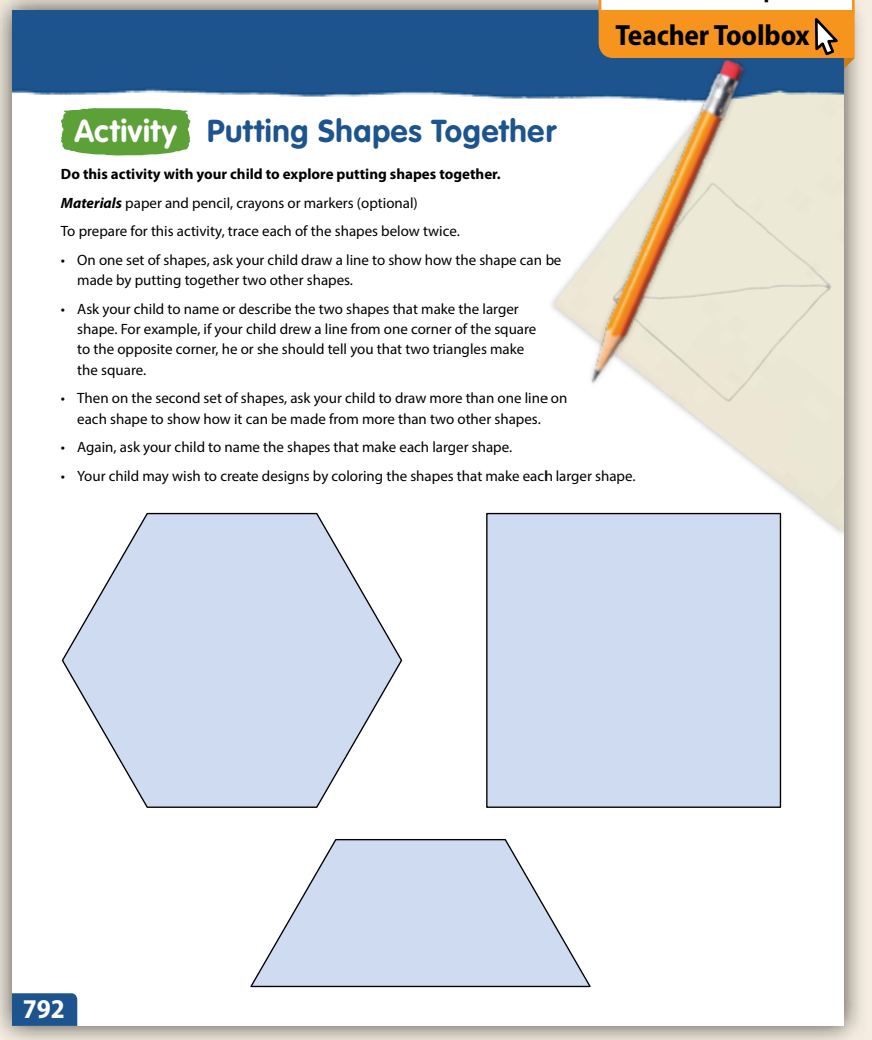
Two ways to make a rectangular prism:

2 cubes | 8 cubes

Composing shapes in this way will help your child understand patterns and practice identifying shapes. It will also help prepare your child to learn about equal parts and fractions.

Invite your child to share what he or she knows about putting shapes together to make other shapes by doing the following activity together.

791



Activity Putting Shapes Together

Do this activity with your child to explore putting shapes together.

Materials paper and pencil, crayons or markers (optional)

To prepare for this activity, trace each of the shapes below twice.

- On one set of shapes, ask your child draw a line to show how the shape can be made by putting together two other shapes.
- Ask your child to name or describe the two shapes that make the larger shape. For example, if your child drew a line from one corner of the square to the opposite corner, he or she should tell you that two triangles make the square.
- Then on the second set of shapes, ask your child to draw more than one line on each shape to show how it can be made from more than two other shapes.
- Again, ask your child to name the shapes that make each larger shape.
- Your child may wish to create designs by coloring the shapes that make each larger shape.

792

Goal

The goal of the Family Letter is to support children as they learn to put shapes together to make other shapes. Identifying shapes and understanding patterns prepare children to understand equal parts and fractions.

Activity

Children share what they know about putting shapes together and work with family members to show two or more shapes that make a larger shape. Look at the *Putting Shapes Together* activity and adjust if necessary to meet the needs of your children.

Math Talk at Home

Encourage children to think of ways to put shapes together in their daily lives such as combining desks and tables or building blocks.

Conversation Starters Below are additional conversation starters children can write in their Family Letter or math journals, with your guidance, to engage family members.

- *What shapes make a hexagon?*
- *What shapes make a square?*
- *What shapes can you make with triangles?*

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Connect to Community and Cultural Responsiveness

Use these activities to connect with and leverage the diverse backgrounds and experiences of all children.

Session 1 **Use with *Try It*.**

- Engage tactile learners with an activity using the sense of touch to identify shapes. Cut a round hole in the lid of a shoe box that is large enough for a child to reach a hand into. Place a solid shape in the shoe box and replace the lid. Have a volunteer reach into the box and try to identify the shape by feel. Reveal the shape and ask children what clues helped them guess the answer, or if children were not able to identify the shape, have them explain which features made it difficult to determine the shape.

Session 2 **Use with *Try It*.**

- Value the work of all children by encouraging pairs to create and add their initials to a poster that shows one way they used pattern blocks to make a hexagon in *Try It*. After children complete the activity, group like patterns together so children can see which other children used the same shapes they did and who used other patterns to show the shape.

Session 3 **Use with *Apply It*.**

- Conduct an internet search of different images of farms and display them to the class. Point to a silo and ask children what shape they see. [cylinder] Ask volunteers to point out other structures or objects that look like a shape. For example, the barn is a rectangular prism or a hay bale is a rectangular prism, cube, or cylinder.

Session 4 **Use anytime during the session.**

- Tessellations are designs made with close-fitting shapes arranged in repeating patterns without gaps or overlaps to make new shapes. These types of patterns are often found in artistic elements of Arabic, Chinese, Egyptian, and Japanese cultures. Ask children if they have ever seen any scarves, clothing, quilts, or artwork with repeating shape patterns. Show some examples of these to use for discussion.

Connect to Language Development

For ELLs, use the Differentiated Instruction chart to plan and prepare for specific activities in every session.

ELL English Language Learners: Differentiated Instruction

Prepare for Session 1
Use with *Connect It*.

Levels 1–3

Writing/Speaking Support children in pairs as they complete the ***Connect It*** problem. Ask children to illustrate vocabulary by drawing a cone, cylinder, rectangular prism, and cube in their math journals and labeling the shapes, at least one face, and at least one edge of each shape when applicable. If needed, allow children to copy the terms from their Student Worktext as they label.

Provide the following sentence frame to help children compare cone and cylinder or rectangular prism and cube:

- *Both shapes have _____.*

Levels 2–4

Reading/Writing Pair children to complete the descriptions in the ***Connect It*** problem. Ask children to create a three-column table in their math journals with the headings *Shape, Faces,* and *Edges*. Have them complete the table to compare and contrast cones, cylinders, rectangular prisms, and cubes. Ask children to choose two shapes and write sentences that describe each shape.

Provide the following sentence frames:

- *The _____ and _____ are alike.*
- *Both shapes have _____.*
- *The _____ and _____ are different.*
- *One shape has _____. The other shape _____.*

Levels 3–5

Reading/Writing After children complete the descriptions in the ***Connect It*** problem, ask them to create a three-column table in their math journals with the headings *Shape, Faces,* and *Edges*. Have them complete the table to compare and contrast cones, cylinders, rectangular prisms, and cubes. Ask children to choose two shapes to compare and contrast and respond in writing to the questions: *How are the shapes alike? How are they different?*

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LESSON 34

SESSION 1 Explore

Purpose In this session children identify the faces of three-dimensional figures to make a connection with two-dimensional shape names.

Start

Connect to Prior Knowledge

Materials copy of printed slide

Why Review the names and attributes of three-dimensional figures to prepare for recognizing the faces of these figures as two-dimensional shapes.

How Draw a line from each figure to its name.

Draw lines to match.

Cube

Cylinder

Cone

Look for

Cube
Cone
Cube
Cylinder

Try It

Materials For each group: geometric solids (or everyday objects in the shapes of a cube, cone, and rectangular prism)

Pose the Problem

Tell children to pick up the geometric solids one at a time and examine them. Remind children that on a solid figure, a flat surface that does not roll is called a face.

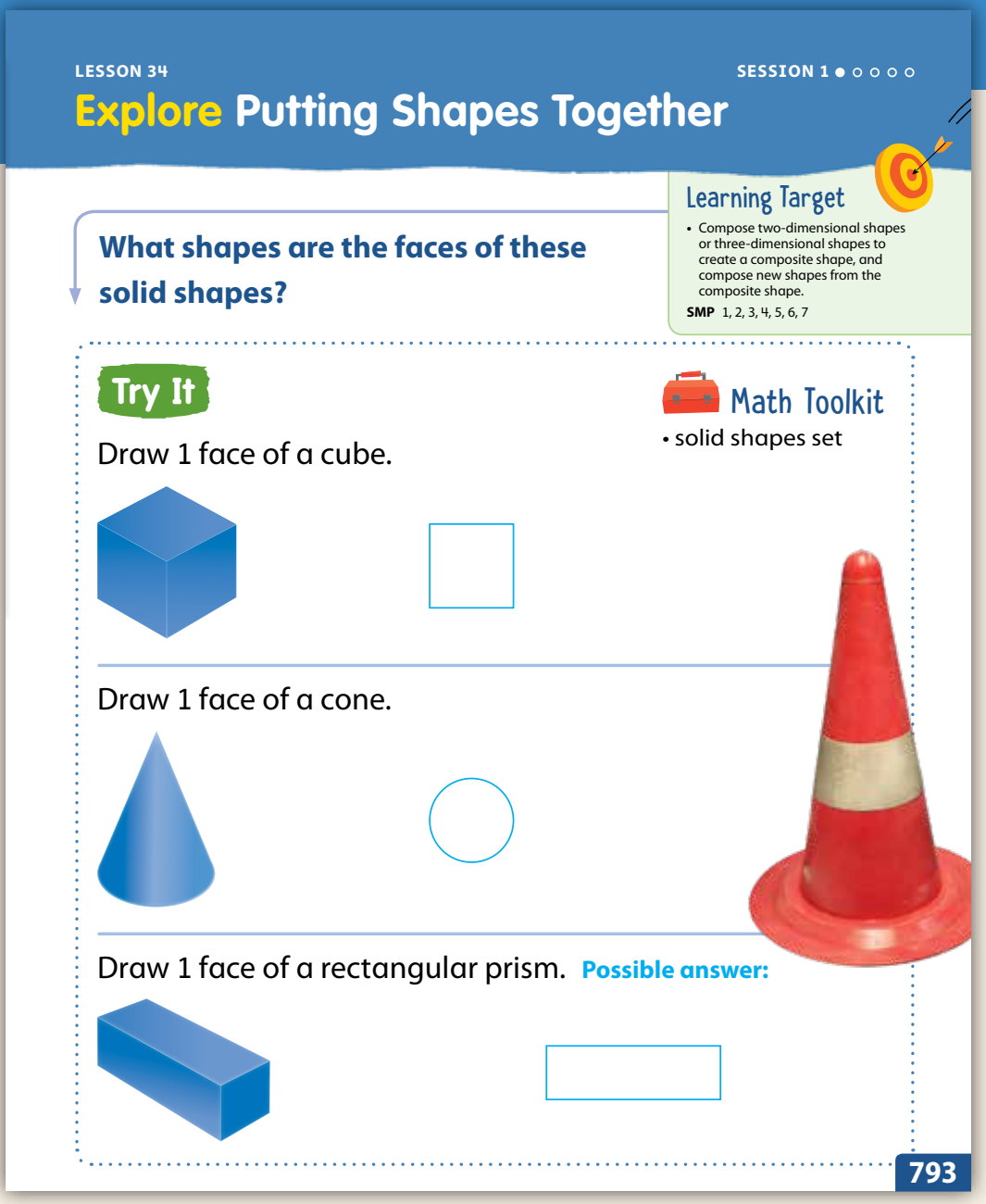
Ask *How many faces does each figure have?*

Listen for The cube and rectangular prism each have 6 faces. The cone has 1 face.

Ask *What shape are the faces of the cube? The cone? The rectangular prism?*

Listen for The cube has all square faces. The cone has a circle face. The rectangular prism has some rectangle faces and some square faces.

Have children draw 1 face of each solid on the Student Worktext page.



LESSON 34 SESSION 1 ● ○ ○ ○ ○

Explore Putting Shapes Together

What shapes are the faces of these solid shapes?

Learning Target

- Compose two-dimensional shapes or three-dimensional shapes to create a composite shape, and compose new shapes from the composite shape.

SMP 1, 2, 3, 4, 5, 6, 7

Try It

Math Toolkit

- solid shapes set

Draw 1 face of a cube.

Draw 1 face of a cone.

Draw 1 face of a rectangular prism. **Possible answer:**

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Common Misconception **If** children struggle with the difference between the rectangular prism and the cube, **then** be sure to have them trace all of the faces so they see that the rectangular prism has both rectangle and square faces, but the cube only has square faces. As they trace each face, put a sticker on that face to keep track of which ones have been traced. Then have them name all of the shapes they traced.

Support Whole Class Discussion

Have children share their drawings with the class.

Ask *How did you know which shape to draw?*

Listen for I know the faces of a cube are all squares. I know that a cone has only 1 circle face. I traced two different faces of a rectangular prism: a rectangle and a square.

Ask *Which figure has more than one kind of face?*

Listen for The rectangular prism has 2 square faces and 4 rectangular faces.

Ask *What do you notice about the names of all shapes of the faces: circle, square, rectangle?*

Listen for They are also the names of two-dimensional shapes, even though they are found on three-dimensional figures.

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Connect It

Materials For each group: geometric solids (or everyday objects in the shapes of a cube, cone, cylinder, and rectangular prism)

Pose a Different Problem

Tell children that they will compare the faces of two different solids. Give pairs some time to examine the solids and discuss their similarities.

Children should record the name of the face that each pair of solids on the Student Worktext page has in common.

Support Whole Class Discussion

Ask *How are the cylinder and the cone alike? How are they different?*

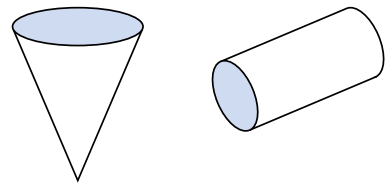
Listen for They can both roll. They have a circle as a face. The cone only has 1 circle face, but the cylinder has 2 circle faces.

Ask *How are the cube and the rectangular prism alike? How are they different?*

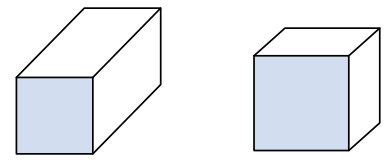
Listen for They both sit flat on the desk. They each have a square face. The cube has 6 square faces, and the rectangular prism only has 2 square faces. The rectangular prism has rectangular faces, and the cube has only square faces.

Connect It

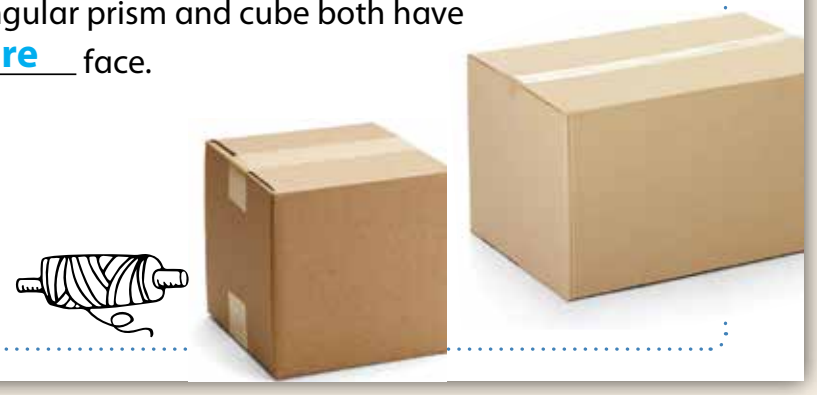
What shapes are these faces?



This cone and cylinder both have a ___circle___ face.



This rectangular prism and cube both have a ___square___ face.



Close: Exit Ticket

Materials For each child: copy of printed slide; For display: geometric solids

Children compare the faces of a cylinder and a rectangular prism.

Can a cylinder roll?
Yes No
Can a rectangular prism roll?
Yes No
A cube has _____ square faces.
A cylinder has 2 _____ faces.

Look for
Yes
No
6
circle

Common Misconception **If** children struggle with remembering the names of the geometric solids, **then** have them help you make a poster with pictures they draw or cut out. Write the name of each solid and then its attributes.

Real-World Connection

Encourage children to think about everyday places or situations where people might see or use objects in the shapes of geometric solids. Have volunteers share their ideas. Examples: party hat, round ball, can, box.

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Solutions

Support Vocabulary Development

1 Read the problem aloud as children whisper read along with you. Invite children to show what they know about the term *circle* with a brainstorming activity. Place a large piece of butcher paper in the middle of the room. Give each child a marker and have them show examples of circles on the paper without talking. Model participating in the activity by adding the following description of a circle to the paper: *A circle is a round, flat shape that has no sides or corners.* Encourage children to quietly move around the paper and gather ideas for their own graphic organizers.

2 If children need support, provide solid figures for them to examine.

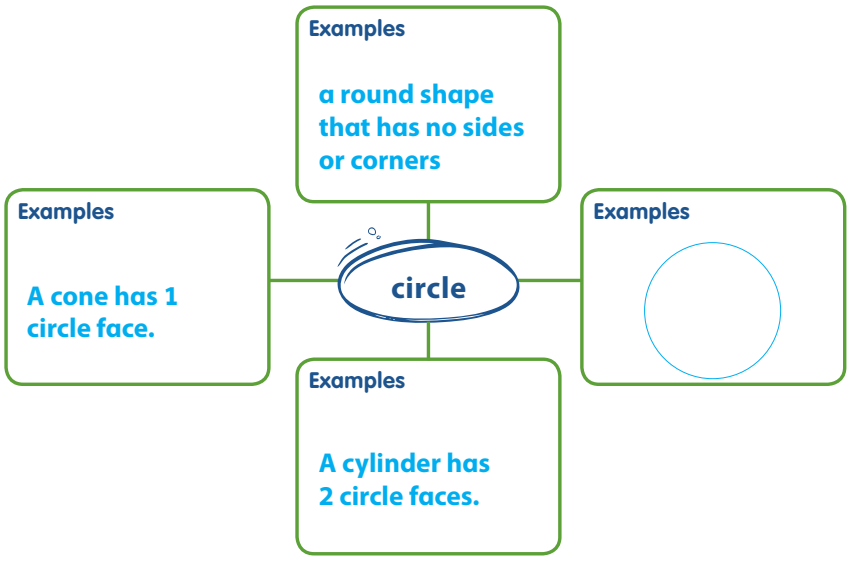
Supplemental Math Vocabulary

- *cone*
- *cylinder*

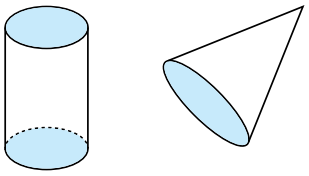
Name: _____ LESSON 34 SESSION 1

Prepare for Putting Shapes Together

1 Think about what you know about circles. Fill in each box. Use words, numbers, and pictures. Show as many ideas as you can. **Possible answers:**



2 Color the parts of the two shapes that are circles.



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3 Assign problem 3 to provide another look at drawing faces of three-dimensional shapes.

This problem is very similar to the problem about drawing one face of a cube, cone, and rectangular prism. In both problems, children are given three-dimensional shapes and asked to draw one face of each shape. The question asks children to draw one face of a cylinder, cone, and rectangular prism.

Children may want to use the geometric solid shape set or a can of food, a conical ice cream cone, and a box.

Suggest that children read the problem three times, asking themselves one of the following questions each time:

- *What is this problem about?*
- *What is the question I am trying to answer?*
- *What information is important?*

Solution:

A face for the cylinder is a circle. A face for the cone is a circle. A face for the rectangular prism is a rectangle or a square.
Medium

Name: _____

3 Solve the problem. Show your work.

Draw 1 face of a cylinder.

Draw 1 face of a cone.

Draw 1 face of a rectangular prism. **Possible answer:**

ELL English Language Learners: Differentiated Instruction

Prepare for Session 2
Use with *Model It*.

Levels 1–3

Speaking/Reading Have children work in groups of three to complete the sentences in ***Model It***. Display the following sentence starter:

You can make a hexagon with _____.

Ask children to underline the sentence starter in each sentence in the ***Model It***. Have children take turns pointing to one of the figures and describing it by completing the sentence starter.

Levels 2–4

Speaking/Reading Have children work in pairs. Ask them to identify the shape in ***Model It***. Then ask: *How can you make a hexagon?* Have children take turns pointing to one of the shapes within the hexagon and describing it by completing the sentences.

Encourage children to repeat the activity. This time, one partner asks the question and the other points to a shape and describes it.

Levels 3–5

Speaking/Listening After children complete the sentences in ***Model It***, put them in small groups to describe more ways to make a hexagon. Give each group 4 index cards with hexagons made from 2 rhombuses and 2 triangles, 1 trapezoid and 3 triangles, 4 triangles and 1 rhombus, and 2 trapezoids. Display the sentence starter:

- *You can make a hexagon with _____.*

Have children take turns selecting an index card, showing it to the group, and describing the hexagon using the sentence starter. The other children in the group signal thumbs up if they agree with the sentence or thumbs down if they disagree.

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LESSON 34

SESSION 2 Develop

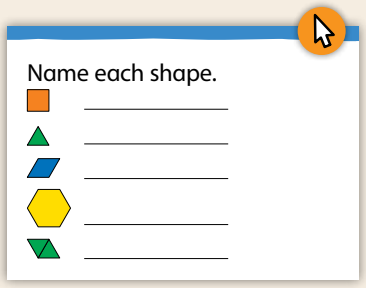
Purpose In this session, children use pattern block shapes to compose another shape. The purpose of this problem is for children to see how individual shapes that are put together in certain ways can form a new shape defined by the outside border of the group of shapes.

Start

Connect to Prior Knowledge

Why Connect children's knowledge of shape names to the shapes of blocks in a pattern block collection.

How Children name each shape shown.



Solutions
square
triangle
rhombus
hexagon
rhombus

Develop Language

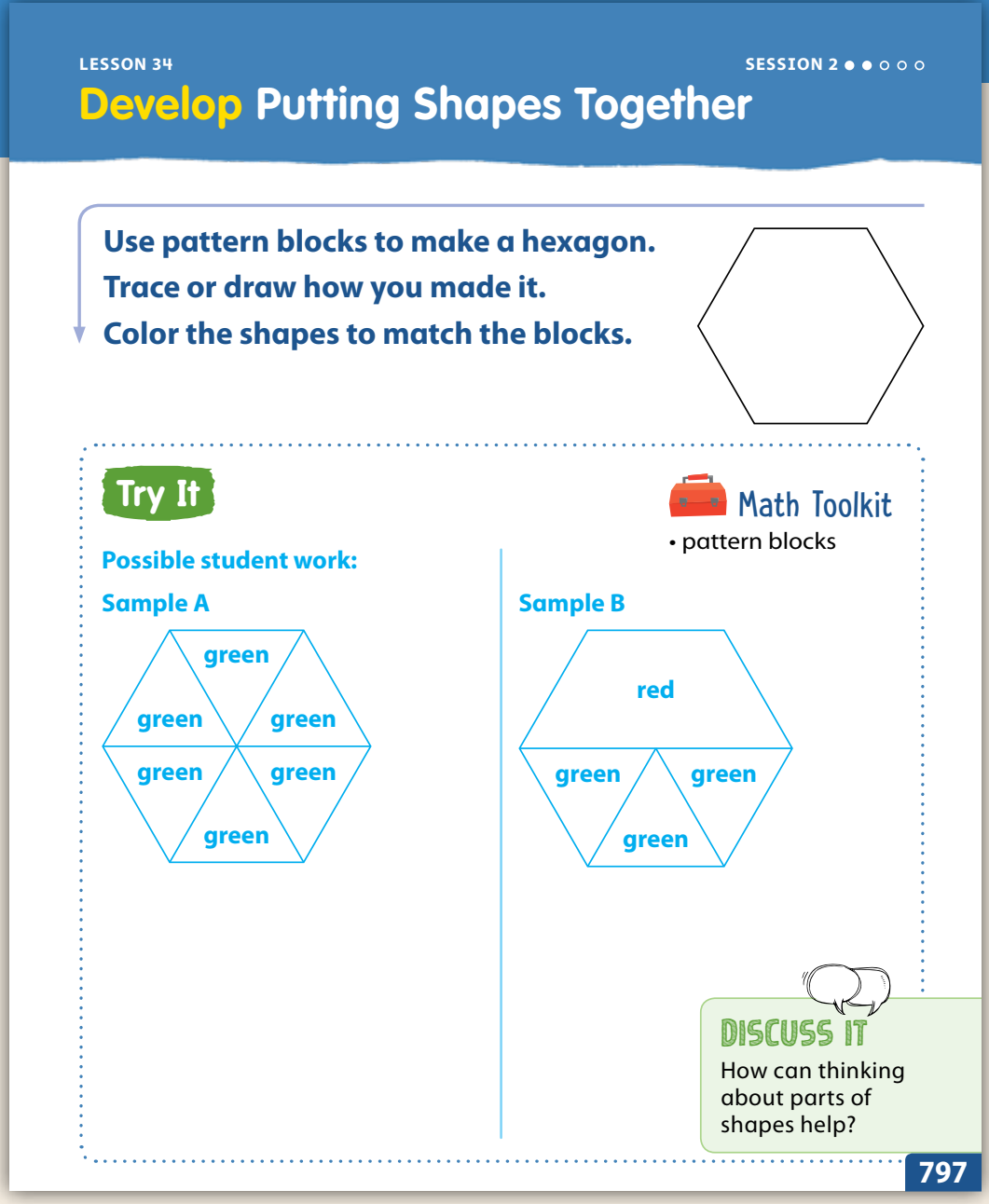
Why Reinforce use of positional words when talking about putting shapes together.

How Draw a hexagon. Cut it into a trapezoid, a rhombus, and a triangle. Have a group of 3 volunteers model moving the cut shapes to make a hexagon. Give them directions such as *Turn the trapezoid around. Move the triangle in another direction. Flip the rhombus over.* Then ask children to use some of the words to describe how they put shapes together to make a hexagon in *Model It*.

Try It

Make Sense of the Problem

Read the problem aloud. To support children in making sense of the problem, prompt them to relate the problem to the previous session.



Ask *How can you tell if the shape you make is a hexagon like this one?*

Discuss It

Support Partner Discussion

Encourage children to name the shapes that they use to build the hexagon.

Support as needed with questions such as:

- *Did your partner use different pattern blocks than you did?*
- *Can you describe your picture to your partner?*
- *Do you think there is another way to make this hexagon?*

Common Misconception **If** children are unsure about the names of all of the pattern blocks, **then** play a game to practice naming all of the shapes before moving on to sharing their solutions. Choose volunteers to take turns asking classmates to show a given shape. For example: "Hold up a hexagon. Show me a triangle. Which block is a rhombus?" etc. Focus on the shape names and reinforce with the corresponding color.

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Select and Sequence Solutions

One possible order for whole class discussion:

- 1 yellow hexagon block
- 6 green triangles
- 2 red trapezoids
- 3 blue rhombuses
- 1 red trapezoid, 1 blue rhombus, 1 green triangle

Support Whole Class Discussion

Compare and connect the different representations and have children identify how they are related.

Ask *What is the fewest number of shapes someone used to make the hexagon? What is the greatest number of shapes someone used?*

Listen for You can use just 1 yellow hexagon. The greatest number of shapes is 6 green triangles. (This may vary depending on the variety of solutions that children produced.)

Model It

If no child presented the models shown on the Student Worktext page, connect these composite shapes to children's models by having children identify how to represent the problem.

Ask *How did you decide what shapes to show in your hexagon drawings?*

Listen for Children can explain which pattern block shapes were combined to make hexagons and which shapes can be combined to make a trapezoid and/or a rhombus within the hexagon.

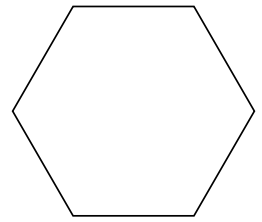
Ask *How is this shape that is made up of several different shapes still a hexagon?*

Listen for Any shape with 6 sides is a hexagon. If you push all of the smaller shapes together and trace the outline, the tracing will have 6 sides. If you place a yellow hexagon on top of this shape, its border matches the group of blocks it covers.

Ask *Do you think there are any other ways to make a hexagon?*

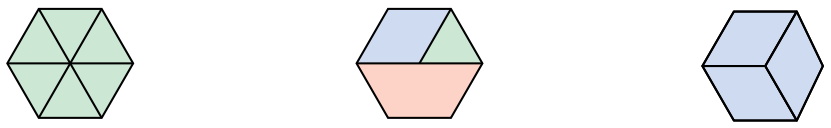
Listen for 2 rhombuses and 2 triangles. 1 trapezoid and 3 triangles. 4 triangles and 1 rhombus. 2 trapezoids.

Use pattern blocks to make a hexagon.
Trace or draw how you made it.
Color the shapes to match the blocks.



Model It

You can make the same shape in different ways.



You can make a hexagon with 6 triangles.

You can make a hexagon with 1 **trapezoid**,

1 rhombus, and 1 triangle.

You can make a hexagon with 3 rhombuses.

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Deepen Understanding

Composing Shapes by Iterating Different Shapes

SMP 7 Look for structure.

As children compose shapes, they are building understanding of patterns and iterating units. Encourage attention to equivalency as children notice both the composite shape and the shapes that form the composite shape.

Ask *What do you notice about 3 triangles compared to 1 trapezoid? What do you notice about 2 triangles compared to 1 rhombus?*

Listen for They take up the same amount of space as each other.

Ask *How can this help you find different ways to make the same shape?*

Listen for You can make it one way and then trade some of the blocks for other blocks that take up the same amount of space.

Ask *What kind of shape can you make with more than 1 orange square?*

Listen for 2 or 3 squares make a rectangle. 4 squares make a larger square.

Generalize *How can you see different shapes within a larger shape?* Listen for children's awareness that they can isolate parts of the overall shape to show how it is composed of smaller shapes.

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Connect It

Support Whole Class Discussion

Ask children to look at what they drew or wrote to solve the problem and compare it to the composite shapes in *Model It*.

1. Help children make sense of the different ways to build a hexagon by comparing it to their own.

   Ask *How did you build a hexagon? Was it like one of the ways in* Model It*? How was it different?*

   Listen for Children may or may not recognize whether their way is the same as one of the ways shown in *Model It* if it is oriented differently. Encourage them to rotate their hexagon or list its components as a way to compare it with the *Model It* ways.

2. **Ask** *How would you explain if a shape is a square or not? Why does Buzz say that this shape is a square? Why does Boom think it is not a square?*

   Listen for A square has 4 sides that are the same length and 4 square corners. The outline of this shape has those things, so it is a square. Boom might think it is not a square because it is not sitting flat on one side or because he sees two triangles inside it.

Apply It

Explain that the next problems are an opportunity for children to practice making shapes with pattern blocks.

Make pattern blocks available.

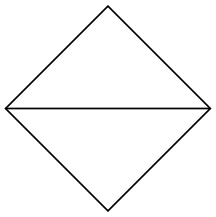
3. 3 triangles.

Connect It

1. How is your way like **Model It**?
   How is it different?
   Children may say that they made a hexagon using 6 green triangles like Model It and they made another hexagon using 2 red trapezoids.

2. Buzz says the two triangles make a square.
   Boom says the shape is not a square.

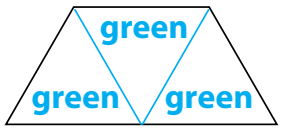
   Who is right? How do you know?



Possible answer: Buzz is right. If you look at the outline, the square has 4 equal sides and 4 square corners.

Apply It

3. Draw lines and color to show how to make this trapezoid using 3 pattern blocks.



What shapes did you use? **3 triangles**

Hands-On Activity

Build trapezoids with pattern blocks.

If . . . *children are unsure about composing a shape with pattern blocks*

Then . . . *use the activity below to connect the model in the Student Worktext page to another concrete representation.*

Materials For each child: pattern blocks

- Have children trace a trapezoid pattern block on their paper.
- Ask how they can use triangles to fill in this shape. *Is there more than one way to use only triangles to build the trapezoid?* [No]
- Ask how they can use triangles and rhombuses to fill in this shape. *Is there more than one way to use triangles and rhombuses to build the trapezoid?* Ask for volunteers to show the different ways to use 1 triangle and 1 rhombus. [Rhombus on left, triangle on right; triangle on left, rhombus on right.]
- Ask how they can use other shapes to fill in this shape. Give children time to use other shapes to try to build the trapezoid. *Can you use a square? Can you use a small rhombus?* [The only other way they can fill the shape is with 1 red trapezoid.]

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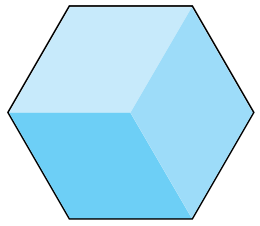
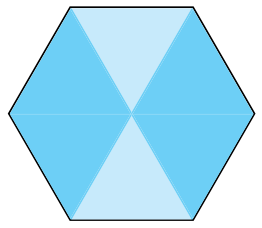
4 Draw lines and color to show 2 ways to make this shape using pattern blocks.

5 Color to show how to make this hexagon.

Use 3 shapes.
Possible answer:



Use 4 shapes.
Possible answer:



4 Possible solution:

Children can use 2 green triangles and 1 blue rhombus (with the rhombus on the left or right), 2 blue rhombuses, or 1 red trapezoid and 1 green triangle (with the trapezoid on the left or right).

5 Possible solution:

3 shapes: 3 rhombuses or 1 trapezoid, 1 rhombus, 1 triangle

4 shapes: 2 rhombuses, 2 triangles or 1 trapezoid, 3 triangles

Support Whole Class Discussion

When children have completed problems 3–5, discuss the answers as a class.

Ask *Which two shapes can you use to replace a blue rhombus in a picture? Which two shapes can you use to replace a red trapezoid in a picture?*

Listen for 2 green triangles make a rhombus. 1 blue rhombus and one green triangle make a trapezoid.

Close: Exit Ticket

Materials For each child: pattern blocks

Children use given numbers of pattern blocks to build a hexagon different ways.

Show how to build a hexagon different ways.
Use 1 block.
Use 2 blocks.
Use 3 blocks.
Use 3 blocks a different way.
Use 6 blocks.

Solutions

1 hexagon;
2 trapezoids;
3 blue rhombuses or 1 trapezoid, 1 blue rhombus & 1 triangle;
6 triangles

Error Alert **If** children do not show both ways to make a hexagon with 3 shapes, **then** rephrase the question and ask them how they can make the hexagon with 3 of the same color pattern blocks. Then ask them how they can make the hexagon with 3 different pattern blocks.

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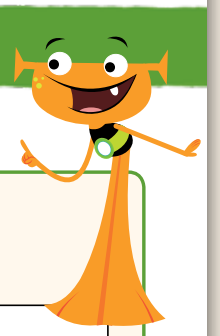
Solutions

1 3 triangles;
1 rhombus and 1 triangle, in any order
Basic

Name: _____ LESSON 34 SESSION 2

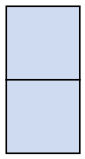
Practice Putting Shapes Together



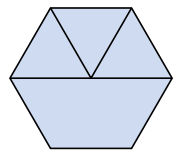
Look at the Example. Then solve problems 1–3.

Example

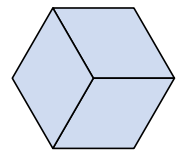
You can put shapes together to make new shapes.



2 squares make a rectangle.



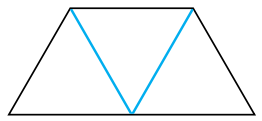
1 trapezoid and 3 triangles make a hexagon.

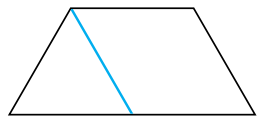


3 rhombuses make a hexagon.

Use shapes like those shown above to make new shapes.

1 Show two ways to put together shapes to make a trapezoid. **Possible answers:**





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Fluency Practice

Practice addition.

Materials For each child: Activity Sheet *Addition Practice 4*

- Distribute a copy of Activity Sheet *Addition Practice 4* to each child.
- Have them use any strategy or tool they choose to practice adding two-digit and one-digit numbers, with and without regrouping.

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2 Possible answers:

6 triangles;

4 triangles, 1 rhombus;

3 triangles, 1 trapezoid;

2 triangles, 2 rhombuses;

1 triangle, 1 rhombus, 1 trapezoid;

3 rhombuses;

2 trapezoids

Medium

3 A trapezoid can be made with 3 triangles, but not 3 rhombuses.

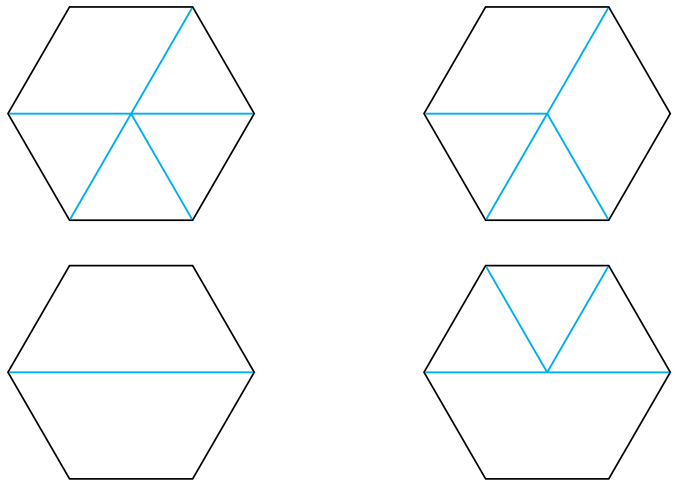
3 rhombuses put together form a hexagon, so Boom is right. Children draw lines within the hexagon to show 3 rhombuses.

Challenge

Name: _____

2 Show different ways to make a hexagon.

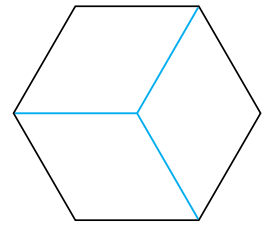
Possible answers:



3 Buzz and Boom each have 3 rhombuses. Buzz says he can put them together to make a trapezoid. Boom says he can put them together to make a hexagon. Draw to show who is right. **Possible answer:**

Buzz

Boom



ELL English Language Learners: Differentiated Instruction

Prepare for Session 3
Use with *Apply It*.

Levels 1–3	Levels 2–4	Levels 3–5
Listening/Speaking Pair children to discuss ***Apply It*** problem 4. Give each pair 2 cylinders and 2 cubes. Point to the problem. Ask: *Which shape can you build from 2 cylinders and 2 cubes?* Encourage children to use the blocks to build the shape. Say the following statements, pausing for partners to confer with one another to determine the answer: • *Point to a circle face. Point to a square face. Point to an edge.*	**Speaking/Reading** Use with ***Apply It*** problem 4. Write the following sentence on a sentence strip, then cut each word apart, mix up the words, and place them in an envelope: *There are 2 cylinders and 2 cubes that make up the shape*. Prepare an envelope for each small group of children. Have children work together to arrange the words in the correct order. Note that the following version is also correct: *There are 2 cubes and 2 cylinders that make up the shape.*	**Listening/Writing** Pair children to discuss ***Apply It*** problem 4. Provide the following term bank for pairs to use in their discussions: *face, edge, cube, cylinder, square, circle, rectangle, corner*. After children have used each term in a sentence to describe the shape, have them write a series of connected sentences to describe the shape in their math journals. If children need additional support, provide the following series of sentence starters: • *This shape is made of _____.* • *There are _____. The shape has _____.*

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LESSON 34

SESSION 3 Develop

Purpose In this session, children use connecting cubes and geometric solids to compose larger three-dimensional shapes.

Start

Connect to Prior Knowledge

Materials For display: 1 cube

Why Review the vocabulary used when describing attributes of two-dimensional shapes and three-dimensional shapes.

How Children count the number of sides of a square and the number of faces of a cube.

How many sides does this shape have?

How many faces does this shape have?

Solutions
square: 4 sides
cube: 6 faces

Develop Language

Why Reinforce understanding of the terms *larger* and *smaller*.

How Explain that the words *small* and *large* describe the size of an object. The words *smaller* and *larger* compare the sizes of two or more objects. Have children find the words in *Model It*. Have them point to the smaller shapes and to the larger shapes. Then have them use these sentence frames to identify them:

- *These are the _____ shapes. This is the _____ shape.*

Try It

Make Sense of the Problem

Read the problem aloud. To support children in making sense of the problem, prompt them to build a shape with connecting cubes. If cubes only connect on one end, allow children to lay cube trains next to and on top of each other to make larger rectangular prisms.

Develop Putting Shapes Together

Put some cubes together to make a new shape.
Tell how many faces it has.

Try It

Math Toolkit
• connecting cubes

Possible student work:

Sample A

6 faces

Sample B

6 faces

DISCUSS IT
The faces on my shape look like . . .

Ask *How many faces does one cube have? When you put two cubes together and ignore the lines between them, how many faces does the new shape have?*

Discuss It

Support Partner Discussion

Encourage partners to build different shapes.

Support as needed with questions such as:

- *How can you keep track of the faces you count on your shape?*
- *Did you and your partner count the same number of faces?*

Common Misconception **If** children count every square of each cube as a face on the larger shape they make, **then** help them see that a face is one entire flat surface on the shape. Use a finger to trace the edges of each face. Have children trace each face of the shape they built on paper and then count the faces they traced. Use stickers, sticky notes, or tape to identify each face as it is accounted for.

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Select and Sequence Solutions

One possible order for whole class discussion:

- train that is 2 cubes long
- train that is more than 2 cubes long
- any size rectangular prism with cube trains stacked or grouped together
- a figure that is not a rectangular prism but consists of groups of smaller cube trains

Support Whole Class Discussion

Compare and connect different representations and have children identify how they are related.

Ask *What is different about everyone's shapes? What is the same?*

Listen for Shapes are different sizes and made from different numbers of cubes. They all have faces, and they are all made from putting cubes together.

Model It

If no child presented the model shown on the Student Worktext page, connect these rectangular prisms to children's models by having children identify how to represent the problem.

Ask *How many faces do the shapes in* Model It *have? What shape(s) are the faces?*

Listen for Both shapes have 6 faces. The faces are either squares or rectangles.

Ensure that children recognize that these drawings represent three-dimensional rectangular prisms even though all faces are not visible.

Connect It

Support Whole Class Discussion

Ask children to look at what they drew or wrote to solve the problem and compare it to the rectangular prisms in *Model It*.

1. Help children make sense of the models presented by comparing them to their own.

Ask *Did you make a shape like one of the shapes pictured in* Model It*?*

Listen for My shape is the same. My shape uses more/fewer cubes. My shape is also a rectangular prism but it is different from the ones in *Model It*.

Put some cubes together to make a new shape.
Tell how many faces it has.

Model It

You can make larger shapes from smaller shapes in different ways.

You can make a larger rectangular prism using ___cubes___.

Connect It

1. How is your way like **Model It**? How is it different?
Children may say that they used 4 cubes lined up to make a long rectangle, while Model It doubled this, using 8 cubes lined up as 2 groups of 4 to make a wider rectangle.

Deepen Understanding

Composing Shapes

SMP 5 Use tools.

Using connecting cubes to compose three-dimensional shapes helps children understand which tools can help solve a problem.

Ask *How many faces does one connecting cube have?* [6] *If you build a train with 3 connecting cubes, how many faces does the new shape have?*

Listen for The new shape is a rectangular prism. It has 2 square faces on the ends and 4 rectangular faces between the ends.

Ask *What happens to the rest of the square faces of each of the small cubes?*

Listen for The square faces of the cubes that touch are "hidden" on the inside of the new figure. They are not faces of the new shape.

Generalize *How does it help to build a new shape with connecting cubes if you want to know how many faces a figure has?* Listen for understanding that the physical model can help with accurately visualizing the composite shape and keeping track of edges and faces when counting them.

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Connect It (continued)

2 **Ask** *How can you tell the name of the new shape?*

Listen for If I don't look at the lines between the cubes, my shape looks like other three-dimensional shapes I know. My shape is a cube. My shape is a rectangular prism.

Apply It

Explain that the next problems are an opportunity for children to practice building three-dimensional shapes using other shapes.

Make geometric solid figures and connecting cubes available.

3 There are 4 cubes on the bottom level and 4 cubes on the top level.

4 Children circle the picture on the left which shows 2 cylinders on top of 2 cubes.

2 How can you tell the name of the new shape?

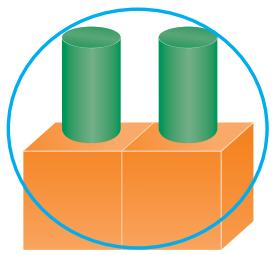
Possible answer: The new shape has rectangle faces and square faces so it is called a rectangular prism.

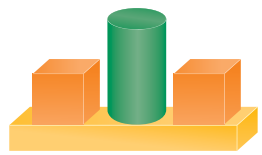
Apply It

3 How many cubes make up this shape?

There are 8 cubes that make up the shape.

4 Circle the shape you could make with 2 cylinders and 2 cubes.





Visual Model

Build rectangular prisms with other objects.

If . . . *children are struggling with counting the faces of rectangular prisms built with connecting cubes*

Then . . . *use this activity to give them an alternative visual model.*

Materials For display: 10 square pattern blocks, 10 number cubes, 10 identical toy blocks or other cubes

- Stack 10 square pattern blocks to make a rectangular prism and display for the class to see.
- **Ask:** *What shape is this?* [rectangular prism] *How many faces does this rectangular prism have?* [6] *What shapes are the faces?* [rectangles and squares]
- Repeat this with the number cubes and the blocks. Consider taping them together with painter's tape to hold them and to show each face as a solid color. Have children examine the rectangular prisms and discuss how they are all the same and how they are different. [All are made with 10 shapes, all are different sizes, all have 6 faces.]

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5 Children draw a line to match with the cone on top of the cube (bottom right figure).

6 Children draw a line to match with the cylinder on top of the rectangular prism (top right figure).

7 Children draw a line to match with the middle tower of cylinder, cube, and rectangular prism (right middle figure).

Support Whole Class Discussion

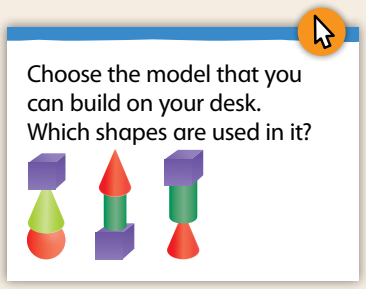
When children have completed problems 3–7, discuss the answers as a class.

Ask *Can you name each of the shapes used in problems 3–7?*

Listen for Children should be able to see each separate shape as a distinct part of the composite shape and name each of the figures accurately.

Close: Exit Ticket

Children choose the model that can be built at their desk using geometric solids.

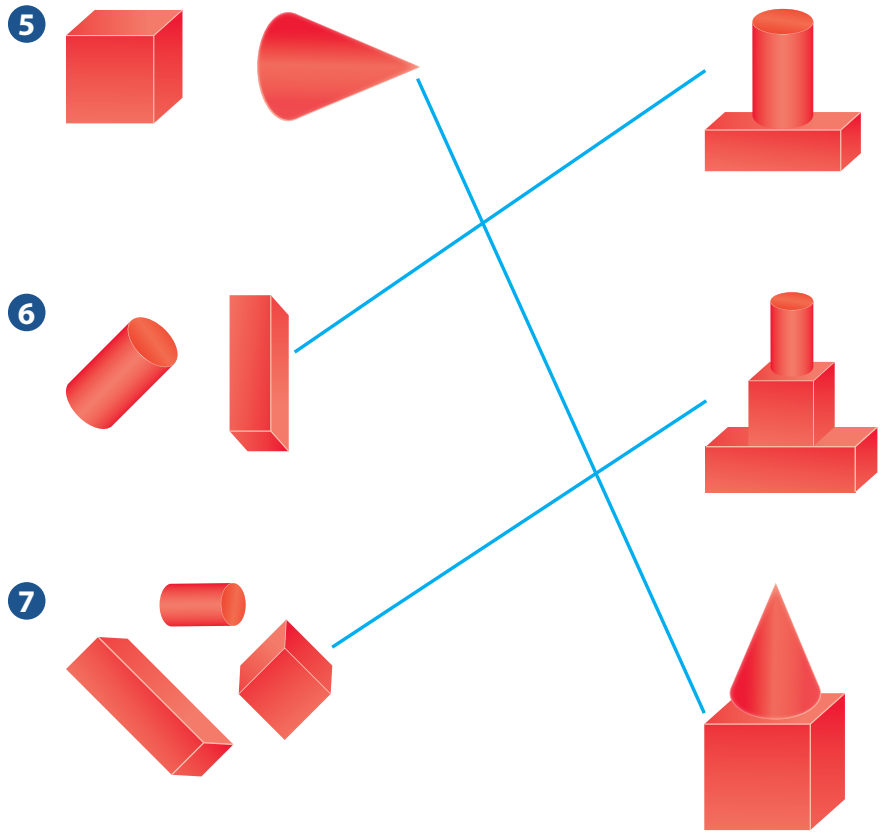


Solution

Only the middle model can be built.
Cube, cylinder, cone

Error Alert **If** children do not understand why only one of the models can be built as shown, **then** let children attempt to build them, or demonstrate for the whole class. Discuss how two flat faces must touch for the model to be stable.

Draw a line to match each set of shapes with the larger shape you could make with them.



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Solutions

1 Children circle the rectangular prism and cube.
Basic

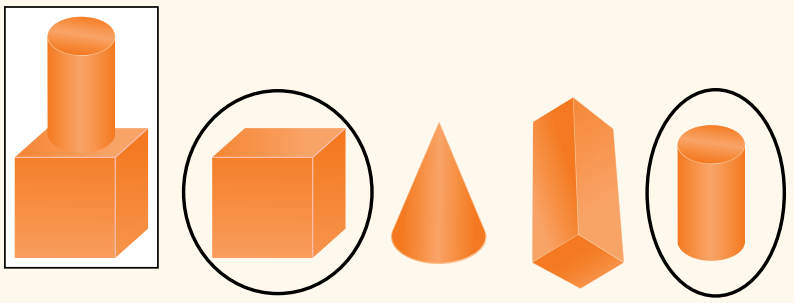
Name: _____ LESSON 34 SESSION 3

Practice Putting Shapes Together

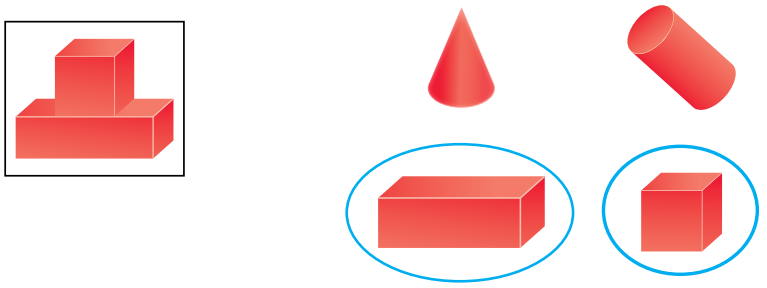
Look at the Example. Then solve problems 1–4.

Example

Circle the shapes that go together to make this shape.



1 Circle the shapes that go together to make this shape.



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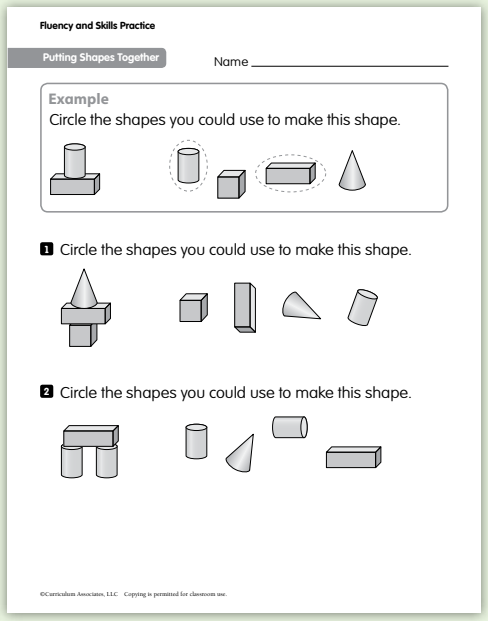
Fluency & Skills Practice

Teacher Toolbox

Assign *Putting Shapes Together*

In this activity children practice identifying three-dimensional shapes that are put together to form a composite shape. Children may recognize that three-dimensional shapes are used to build things all around them. For example, a cone and a rectangular prism can be put together to build a safety cone. Children may also want to describe how they built a composite shape using a set of blocks.


Fluency and Skills Practice

Putting Shapes Together Name _____

Example
Circle the shapes you could use to make this shape.

1 Circle the shapes you could use to make this shape.

2 Circle the shapes you could use to make this shape.

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2 Children circle the rectangular prism, cube, and cylinder.
Basic

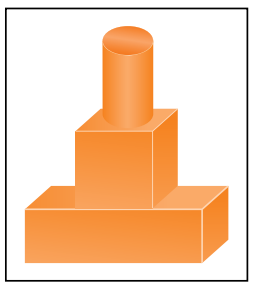
3 Children circle the bottom figure.
Challenge

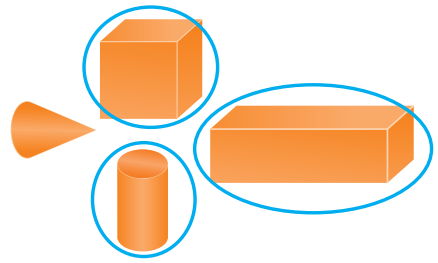
4 6 cubes make the shape.
Challenge

LESSON 34 SESSION 3

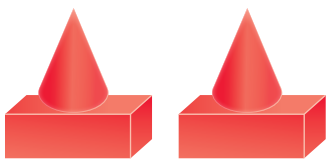
Name: _____

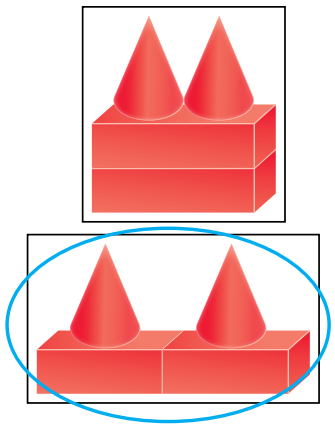
2 Circle the shapes that go together to make this shape.





3 Circle the shape you can make if you put these two shapes together.





4 How many cubes make this shape?

_6_ cubes make the shape.

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ELL English Language Learners: Differentiated Instruction

Prepare for Session 4
Use with *Apply It*.

Levels 1–3

Speaking/Listening Pair children to discuss ***Apply It*** problem 4. Display the following sentence frame:

- *This is a _____ made with 2 _____.*

Have children take turns pointing to one of the figures and describing it by completing the sentence frame.

Encourage them to tell how they know which shows a square. Provide a sentence frame:

- *The square has _____ equal sides.*

Levels 2–4

Speaking/Listening Pair children to discuss ***Apply It*** problem 4. Display the following sentence frame:

- *This is a _____ made with 2 _____.*

Have children take turns pointing to one of the figures and describing it by completing the sentence frame.

Encourage them to tell how they know which shows a square. Provide a sentence starter:

- *The square has _____.*

Levels 3–5

Speaking/Writing Pair children to discuss ***Apply It*** problem 4. Provide the following terms for children to include in their discussions: *square, rectangle, corner, side.* Encourage partners to create a sentence about one of the shapes, using at least two of the terms. Have children write the sentence in their math journals.

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LESSON 34

SESSION 4 Refine

Purpose In this session children practice putting together two-dimensional and three-dimensional shapes to make new shapes.

Start

Develop Fluency

Materials For each child: 1 set of tangrams or Activity Sheet *Tangram Shapes*

Why Use a visual model as a guide to practice putting together two-dimensional shapes to create a composite shape.

How Children use tangram pieces to create the shape shown. (Color is used to distinguish each shape in the model; children's tangram pieces do not need to match the colors on the model.)

Make this shape using tangrams.

Look for

Children arrange tangram pieces to make the shape on the slide.

Example

Read the Example problem aloud and have children name the shapes highlighted.

Ask *What is the same about all of the examples? What is different?*

Listen for There are always 4 triangles that form 2 squares. The two squares form a rectangle. A different set of triangles is colored purple in each set.

Ask *If you shade the first and last triangles, does it make a familiar shape?*

Listen for No, the first and last triangles aren't touching.

Apply It

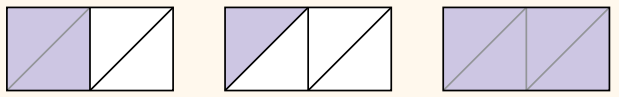
1. Triangle aligned on the shorter of the two parallel sides of the trapezoid. May appear as trapezoid on bottom and triangle on top, or may be this same arrangement rotated. ***DOK 2***

Refine Putting Shapes Together

Complete the Example. Then solve problems 1–5.

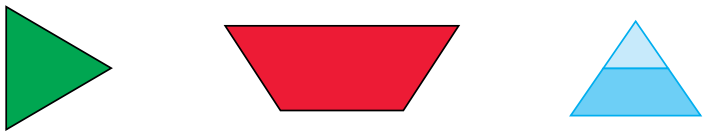
Example

What shapes do you see shaded purple here?

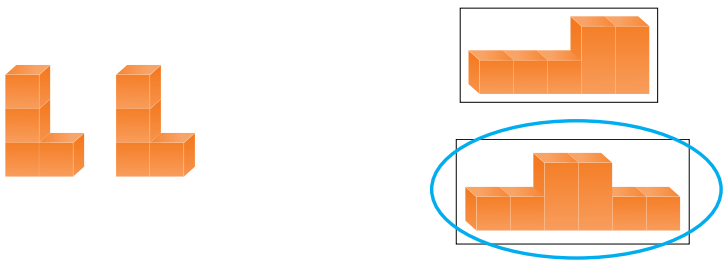


square triangle rectangle

1. Use these shapes to make a triangle. Draw lines and color to show how.



2. Circle the shape you can make if you put these two shapes together.



2. The composite shapes must be repositioned to rest on the faces originally shown vertically. Then they are pushed together to make the second composite figure. ***DOK 2***

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3 Some possible solutions:

2 trapezoids and 1 hexagon

4 trapezoids

2 trapezoids, 2 rhombuses, 2 triangles

12 triangles

DOK 2

4 The first composite shape is a rectangle made with two squares. The second composite shape is a square made with two rectangles. The second figure is circled.

DOK 2

5 Buzz is not right; See possible answer on the Student Worktext page.

DOK 3

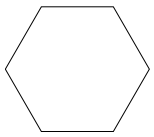
Close: Exit Ticket

Check for Understanding

Materials For each child: pattern blocks

Ask children to use 5 pattern blocks to make a hexagon.

Use 5 pattern blocks to make a hexagon.



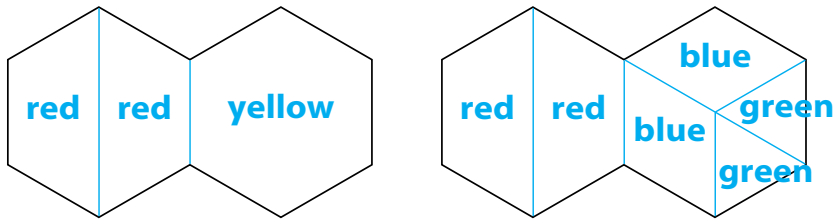
Solution

1 rhombus and 4 triangles

Error Alert For children who are still struggling, use the table on the right to guide remediation.

After providing remediation, check children's understanding of the following problem: Use pattern blocks to make a trapezoid two ways: using 2 blocks and using 3 blocks.

3 Draw lines and color to show 2 different ways to make this shape with pattern blocks. **Possible answer:**



4 Which shows a square made with 2 rectangles? Circle it.

5 Buzz says any even number of squares can be used to make a larger square. Is he right? How do you know?

Possible answer: Buzz is not right. Not all even numbers of squares will make a larger square. You can use 4 squares to make a square, but 2 squares or 6 squares will not make a square.

Error Alert

If the error is . . .	*Children may . . .*	*To support understanding . . .*
using more than 5 shapes	have used only triangles to make the hexagon.	Ask children what other shapes can be made with triangles. Encourage them to replace two triangles with a rhombus and then count how many blocks they used in all.
using fewer than 5 shapes	may have used larger shapes such as a trapezoid to fill in the hexagon.	Help children realize that they have used too few blocks. Encourage them to find ways they can trade a block for more than one block that will fill the same space.
did not build a hexagon	may not have understood the problem.	Give children a printed copy of the slide and allow them to use pattern blocks to fill in the outline of the shape.

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Solutions

1 Lines drawn to match the following:
top figure: 3;
middle figure: 4;
bottom figure: 5
Basic

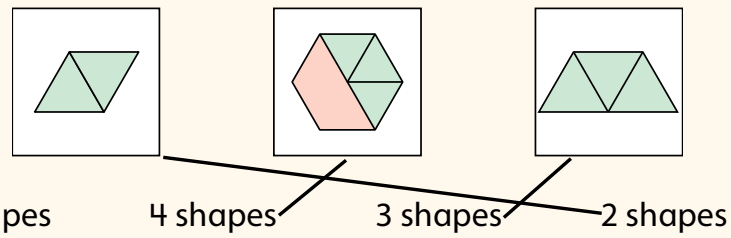
Name: _____ LESSON 34 SESSION 4

Practice Putting Shapes Together

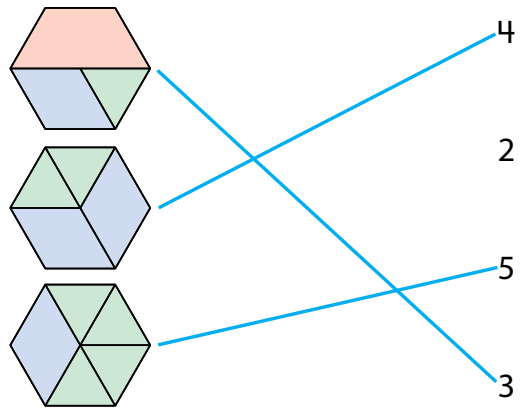
Look at the Example. Then solve problems 1–3.

Example

Draw lines to match the picture with the number of shapes that make it.



1 Draw lines to match the picture with the number of shapes that make it.



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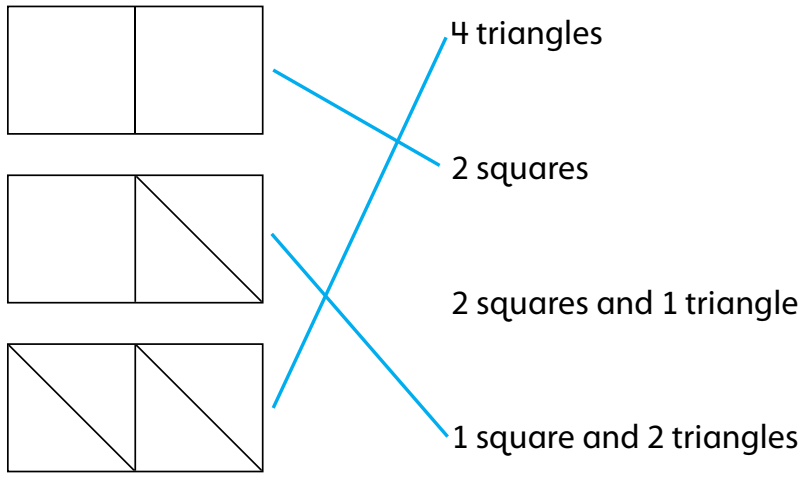
2 Lines drawn to match the following:
top figure: 2 squares;
middle figure: 1 square and 2 triangles;
bottom figure: 4 triangles
Medium

3 Circle 3 shapes: rectangular prism, cone, and 1 cube (either one).
Challenge

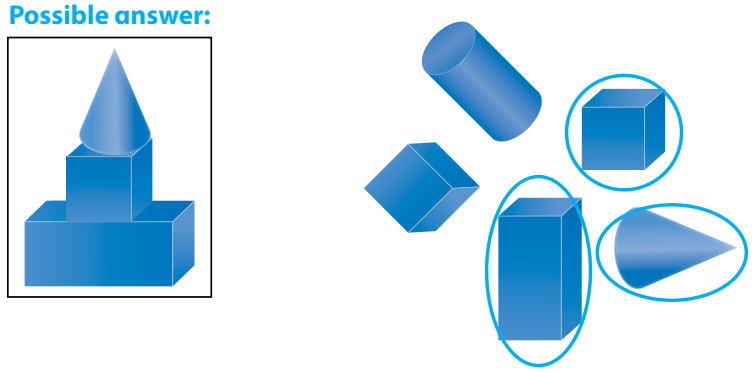
Name: _____

2 Draw lines to match each picture with the shapes that make it.



3 Circle the shapes you could use to make this shape.

Possible answer:



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LESSON 34

SESSION 5 Refine

Purpose In this session children practice putting together two-dimensional and three-dimensional shapes to make new shapes.

Start

Develop Fluency

Why Practice identifying three-dimensional shapes that make up a composite shape.

How Children name the shapes that are used in the pictured composite shape.

Name the shapes used to make this shape.

Listen for

2 cubes, 1 cylinder, 1 cone

Some children may say that the orange part of the figure looks like a rectangular prism. Validate this, and also explain that it is made of 2 cubes.

Apply It

1. Children's pictures will vary. They should use at least 4 shapes in each.
DOK 2

2. Children's answers will depend on the shape that they made in problem 1.
DOK 1

3. 3 shapes: 1 square and 2 triangles;
4 shapes: 4 triangles
DOK 2

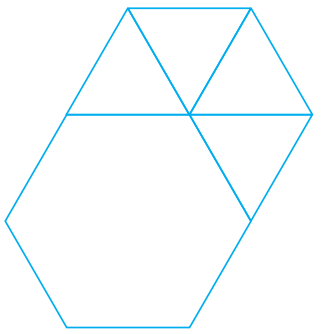
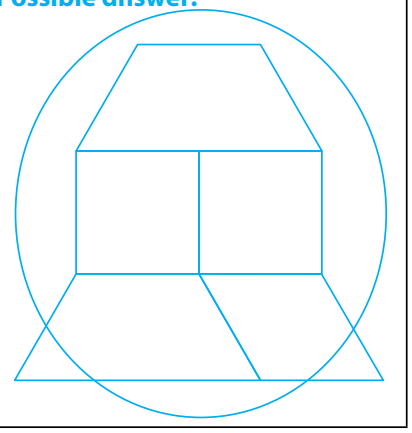
4. The shape on the bottom right should be circled. It can be made by fitting the two shapes together.
DOK 2

Refine Putting Shapes Together

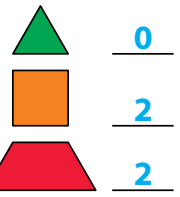
Apply It

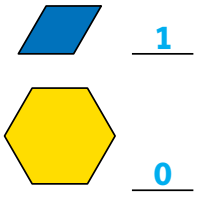
Solve problems 1–4.

1. Use 4 or more pattern block shapes to make 2 new shapes. Draw them.

Possible answer:	Possible answer:
	

2. Circle one shape above that you made.
Write how many of each shape you used. **Possible answer:**





Differentiated Instruction

RETEACH

Hands-On Activity

Match shapes to outlines.

Children struggling with concepts of composing shapes

Will benefit from additional work with pattern blocks.

Materials For each child: pattern blocks, Activity Sheet *Pattern Blocks 2*

- Have children place actual pattern blocks within each shape on the activity sheet, naming the shapes and the number of sides.
- Have children remove the pattern blocks. Point to the rhombus. Ask children to make the rhombus shape with pattern blocks other than the blue rhombus. Allow children time to experiment with different shapes until they find a combination that works.
- Guide children to try this on the trapezoid and hexagon, placing different pattern blocks within the outlines to see which pattern block combinations can make these shapes.

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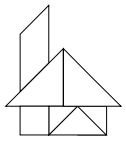
Close: Exit Ticket

Math Journal

Use tangram pieces to make the shape shown.

Use tangrams to make this shape.



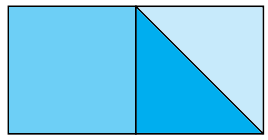
Look for The shape is made of 2 large triangles, 1 medium triangle, 2 small triangles, 1 parallelogram, and 1 square positioned as in the picture.

Error Alert **If** children struggle with composing the shapes to make the picture shown, **then** give them a printed copy of the slide so that they can match the shapes on the page with the tangram pieces.

3 Color to show how to make this rectangle using other shapes.

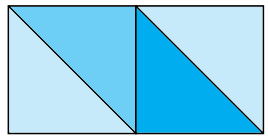
Use 3 colors to show 3 shapes.

Possible answer:

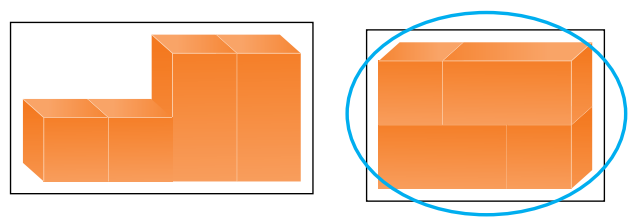


Use 4 colors to show 4 shapes.

Possible answer:



4 Circle the shape you can make if you put these two shapes together.



EXTEND

Challenge Activity

Make pictures with shapes.

Children who have achieved proficiency

Will benefit from deepening understanding of composing shapes

Materials For each child: tangram pictures, 7 tangram pieces or Activity Sheet *Tangram Shapes*

- Display pictures made from tangram pieces, Challenge children to replicate the figure using tangram pieces.
- Then allow time for children to make their own tangram puzzles or pictures. Encourage children to use all seven pieces in their pictures. Have children arrange their shapes on a sheet of paper to form a picture. Once the picture is made, children trace around it to make an outline.
- Allow children to trade papers. See if another child can solve the puzzle by placing the tangram pieces within the outline in the same arrangement as the picture that was originally made.

PERSONALIZE

i-Ready

Provide children with opportunities to work on their personalized instruction path with *i-Ready* Online Instruction to:

- fill prerequisite gaps
- build up grade-level skills

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