Practice On Your Own (Student Book, pages 67 to 70)

- **QUESTION 1** assesses your student's ability to identify unit fractions in different shapes divided into a different number of equal parts.
- **QUESTIONS 2** and **3** assess your student's ability to identify fractional parts.
- **QUESTION 4** assesses your student's ability to show unit fractions in different shapes divided into equal parts.
- **QUESTION 5** assesses your student's ability to show $\frac{1}{6}$ on two different shapes in different ways.
- **QUESTION 6** assesses your student's ability to divide identical rectangles into equal parts in two other ways. Your student then identifies the fraction of the area of each part in relation to the area of the whole.
- **QUESTION 7** assesses your student's ability to determine the total number of parts in wholes divided into different-sized parts.

Think!

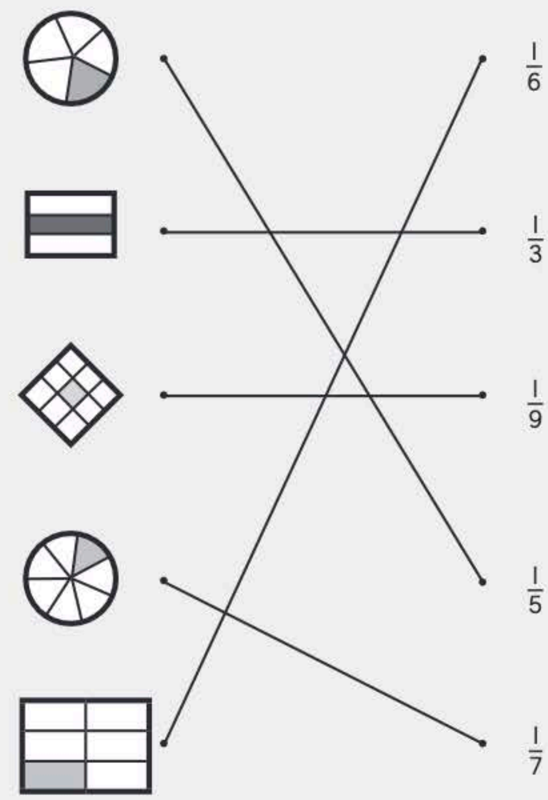
- **QUESTION 8** assesses your student's ability to reason that the square is divided equally by drawing to show his/her reasoning. The square is divided into 2 halves. One half is divided into 2 equal squares. The other half is divided into 2 equal triangles. Each square and triangle is "half of half."
- This interesting problem requires your student to see fourths in two different ways and then prove each fourth, being $\frac{1}{4}$ of the same whole, is exactly the same size even though shapes are different. You may wish to ask the following questions:
  What have you done before that can help you solve this question? Is there another way? How can you prove your thinking? What heuristic might you use to help you solve this?

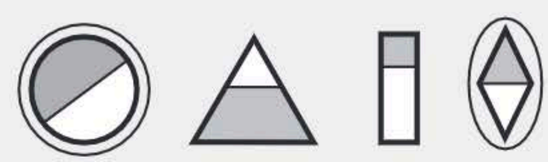
Caution

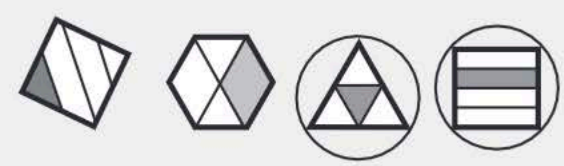
This sequence of practice questions requires your student to use visual reasoning. If your student misidentifies the shapes, which show $\frac{1}{2}$ and $\frac{1}{4}$ in Questions 2 and 3, have him/her go back to the concrete paper shapes. Your student can trace, cut, and place pieces on top of each other to prove congruency, then close his/her eyes to try to see that before returning to Questions 2 and 3.

Practice On Your Own Answers

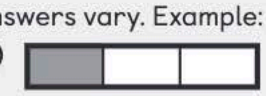
(Student Book, pages 67 to 70)

1.


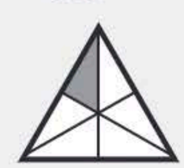
2.


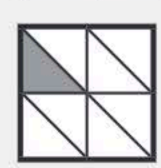
3.


4. Answers vary. Example:

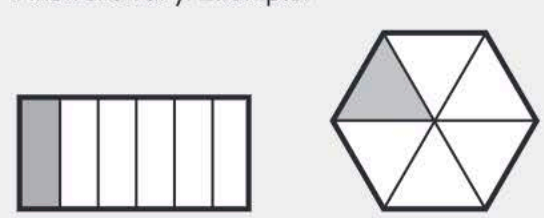
(a)


(b)


(c)


(d)


5. Answers vary. Example:



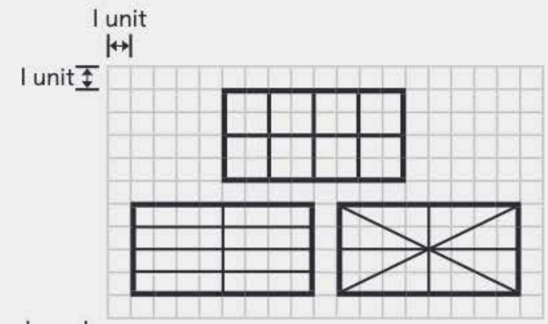
More Resources

- Refer to **Do More at Home** below and **Reteach 3, Exercise 7A** if your student needs additional support.
- When your student is ready, have him/her work on **Additional Practice 3B, Exercise 7A**.
- To provide your student with a challenge, have him/her work on **Extension 3, Exercise 7A**.
- You may also assign **Mastery and Beyond 3B, Chapter 7, Practice 1** to provide further support and development to sustain learning.

Do More at Home

Where is It?
Invite your student to play this version of memory using Unit Fraction Cards (TR27). Place the Unit Fraction Cards (TR27) and their matching models face down. Be sure to include models using fraction circles and fraction tiles.
Player 1 turns over one card and one model. If they match (a unit fraction with its model), the player keeps the card and the model. If they do not match, the player turns the card and the model again.
Player 2 turns over a card and guesses where the matching model might be.
You and your student take turns until all the cards and models are gone. The player with the most pairs wins!
Use both models (fraction circles and fraction tiles for each unit fraction) and find a triple match for extra challenge!

6.

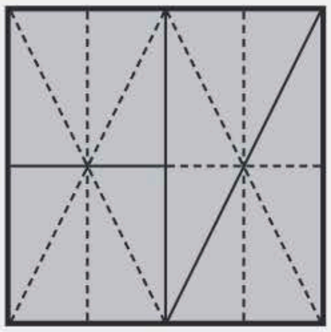


$\frac{1}{8}$, 4; $\frac{1}{8}$

7. 2; 4; 3; 10

Think! Answers

8. Answers vary. Example:



Each of the 4 equal parts is made up of 4 triangles of the same size. So, the whole is divided into 4 parts with equal area.

For Additional Support

If your student does not have a strong foundation of breaking apart numbers and recombining them (commonly called decomposition and composition of number), he/she will tend to find working with fractions difficult. The ability to break 1 whole into fractional pieces rests on a foundation of breaking apart 10 and being able to use the numbers found within it.

It is critical that you take care of this number sense gap now, as future mathematics, pre-Algebra and Algebra, relies on understanding of fractions and (eventually) the proportional reasoning they represent. Ideas for bridging the number sense gap include:

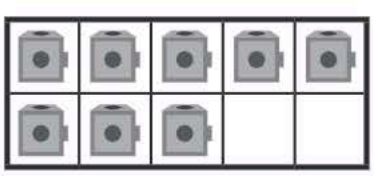
- Use connecting cubes to show the combinations that make 10 and all the numbers within 10. Offer only two colors to your student for each number to prevent visual confusion. Your student should build 10 as number trains of two parts for all the possible combinations. Here is a sample train for 7 + 3 = 10:

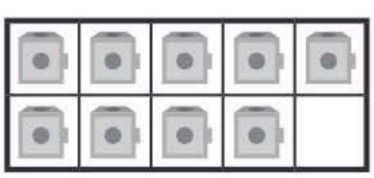
  Your student can make a "Ten Wall" by stacking the different number trains that form 10 (9 + 1; 8 + 2, etc.)
- Have your student draw representations of all the numbers within 10 on Ten Frame (TR28). He/she should be able to recognize at a glance how many more cubes are needed to make ten.

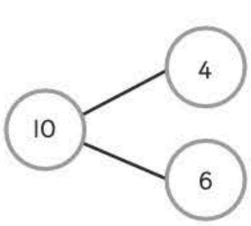
  7
  seven

  8
  eight

  9
  nine
- Familiarize yourself with number bonds (a visual model that highlights numerical relationships) and have your student begin to use them to show how to break apart numbers. Here is one way to make a number bond of 10:

Digging Deeper

Use the following problems to challenge your student to extend and deepen his/her thinking about unit fractions.

- **True or False, and Why? 2 is less than 3, so $\frac{1}{2}$ is less than $\frac{1}{3}$.** *The statement is false. $\frac{1}{2}$ is larger than $\frac{1}{3}$ because there are fewer equal pieces in the whole. 1 out of 2 equal pieces is larger than 1 out of 3 equal pieces.*

You may also wish to extend the **Think!** Question on page 70. Offer your student Paper Squares (TR22) and invite him/her to find as many different ways as possible to divide it into equal parts. Encourage your student to prove his/her thinking.

- **How many ways are there?**

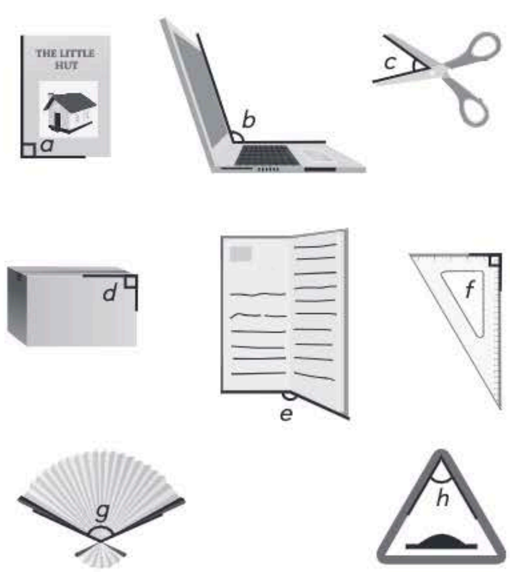
Chapter

10 SHAPES

Chapter Overview

In this chapter, your student's knowledge of drawing, sorting, and partitioning 2-D shapes from Grade 2 will be extended to understanding angles regardless of orientation in space, right triangles, triangles with angles larger or smaller than right triangles, and various types of quadrilaterals. By the end of the chapter, your student will be able to tell the differences and similarities between rectangles, squares, and rhombuses, and explain how side length and angle type affects the definition of various 4-sided figures. Your student will:

- **recognize and name right angles** in real-world objects and drawings.

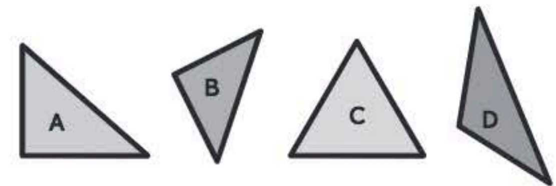


- **identify and draw angles** that are smaller or larger than right angles.
  Compare the marked angles to a right angle.
  Write **smaller** or **larger**.

(a)  larger than a right angle.

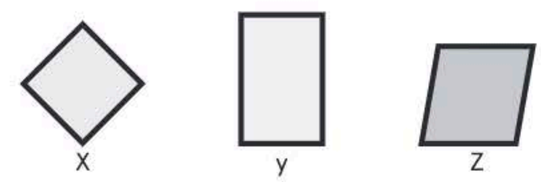
(b)  smaller than a right angle.

- **recognize and sort triangles** by their angles.

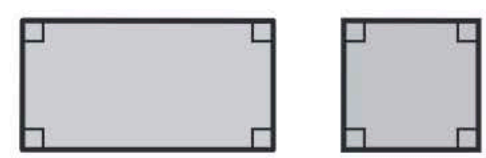


(a) Triangles A and B are right triangles.
(b) Triangle C only has angles smaller than a right angle.
(c) Triangle D has an angle larger than a right angle.

- identify **various quadrilaterals**.

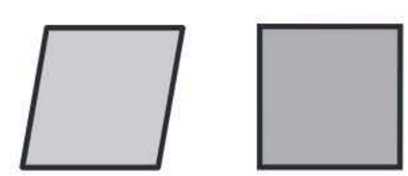


- **identify and compare** rectangles, squares, and rhombuses.

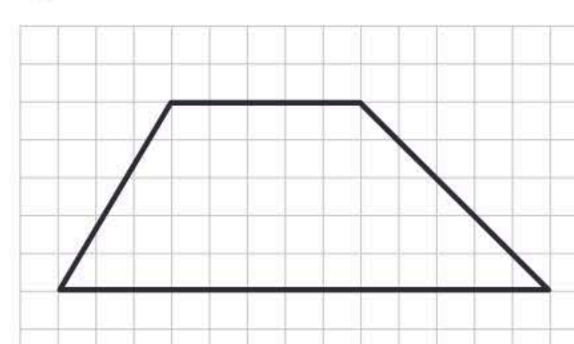


Compare a square and a rectangle.
How are they alike?
How are they different?

This is a **rhombus**.
It has 4 equal sides.

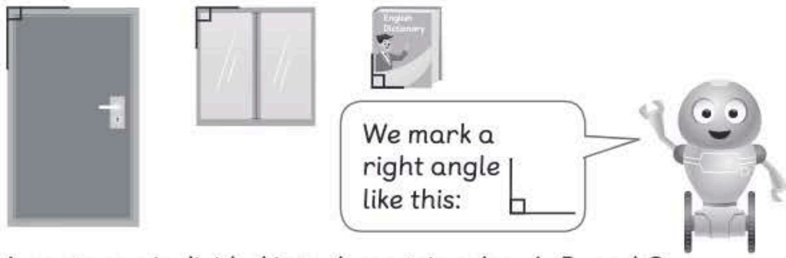


- **identify and draw quadrilaterals** other than rectangles, squares, and rhombuses.

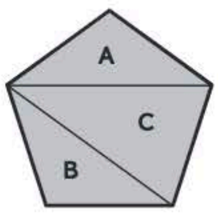


Key Ideas

- We can recognize and identify right angles, angles that are larger than a right angle and angles that are smaller than a right angle in real-world objects and in triangles.



A pentagon is divided into three triangles, A, B, and C.



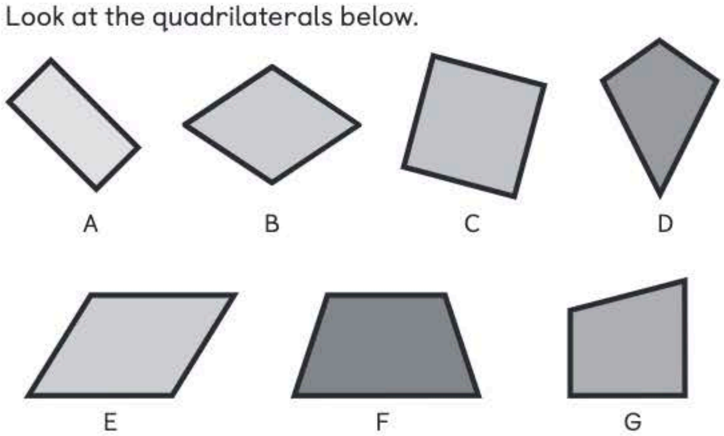
(a) Triangles A and B each have ___2___ angles smaller than a right angle.

Each triangle also has ___1___ angle larger than a right angle.

(b) All angles in Triangle C are ___smaller___ than a right angle.

- We can identify, compare, and draw quadrilaterals.

Look at the quadrilaterals below.



Fill in the blanks.

(a) Figure ___B___ has 4 equal sides and no right angles.

It is a ___rhombus___.

(b) Figures ___B___, ___D___, ___E___, ___F___, and ___G___ are not rectangles.

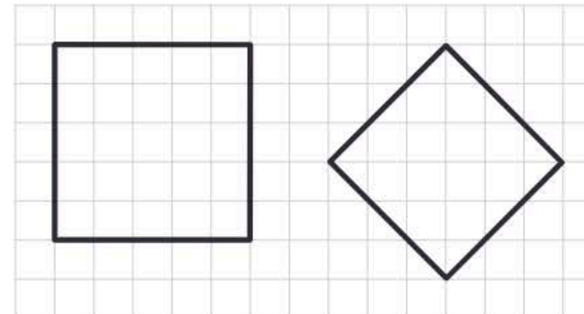
(c) Figure ___C___ has 4 right angles and 4 equal sides.

It is a ___square___.

(d) Figure ___G___ has right angles, but is not a square or a rectangle.

Draw a quadrilateral that is **both** a rhombus and a rectangle.

Answers vary.



Materials You Will Need

- 1 piece of graph paper
- 1 ruler
- 1 set of index cards
- 1 set of attribute blocks
- 1 set of craft sticks
- 1 set of pattern blocks
- Shape Cutouts (TR35)

Activity! (Student Book, page 190)

The purpose of this activity is to prove to your student that right angles are formed at the corners of perfect squares. Allow your student to physically fold a paper and check for right angles, as well as discover many such angles around the study room.

What is true of right angles? *They can be measured with anything that has a perfectly square corner because they fit a square perfectly.* **What makes right angles different from other angles that are not right angles?** *The other angles are smaller or larger than right angles.* **How do you know?** *We can measure them using a tool that we make ourselves from a carefully folded paper.* **If you make the tool yourself, what must you be careful to do?** *I must carefully fold the paper so that the corner is square.* **What other tools might you use?** *Anything that has a square corner will work as a tool.*

Invite your student to consider if the paper must be folded into equal parts to get a right angle.

What are some ways you could find out? *I could fold a paper with unequal parts and see if that works.* **Try it!**

Your student should determine that the size of the parts does not matter, but the lines must be straight to make a right angle. Your student could fold a paper into two or more unequal horizontal strips, but if the lines are parallel and the cross fold is perpendicular, he/she will produce a right angle.

What is important in order to make a right angle? *I have to make sure my lines are perfectly lined up; the size of the folds does not matter.*

Learn Together (Student Book, pages 191 and 192)

In this section, your student will learn to observe angles that are larger or smaller than right angles, and will classify triangles by angle type. Invite your student to observe each picture before proceeding with the problems in **Learn Together**. Take care to hide the robot's speech bubble in Question 2, and give your student some time to generate that thought before showing it.

Through questioning, lead your student to identify the angles that are smaller or larger than a right angle and describe triangles using different types of angles in **Learn Together**. As you go through the problems with your student, you may wish to ask the following questions:

Why do we call these triangles? *Tri means "three." A triangle is a shape with three angles.* **What sorts of different triangles do you see? What are a few ways to describe triangles by the angles that are contained inside them?** *Right triangles; triangles larger or smaller than right.* **Which other shapes can you make using only triangles?** *Answers vary.*

Activity! Answers

(Student Book, page 190)

(b) Answers vary.

For Additional Support

Your student will need to play with angles physically in order to understand the differences among them. **Activity** on page 190 of the Student Book will help your student get much needed practice and ground his/her understanding in real-world experience.

Make sure your student sees angles in a variety of orientations, not just upright. Point out naturally occurring angles in various locations and orientations.

Is this an angle too? Why or why not? How do you know if it is an angle when it opens in the opposite direction? *An angle is formed wherever two lines meet at a point. It does not matter which direction the opening of the angle is facing.*

Digging Deeper

Help your student practice creating and identifying different angles with a ruler on a whiteboard. Draw any two lines that meet at a vertex. Your student can check to see if the angles are right angles or not, then indicate that by drawing either a small square or an arc inside the vertex. Be sure to vary the orientation of the angles. To make this activity more fun, switch places.

Variation: cross any two lines and indicate the type of angles formed by them.

If one angle is right, what is true of the other angles formed at the spot where the lines cross? *They are all right.* **If one angle formed by the crossing lines is larger than a right angle, what will be true of the other angles?** *One will also be larger, and the other two will be smaller.* **Is there a pattern?** *Yes; opposite angles are either both smaller or both larger than right angles.*