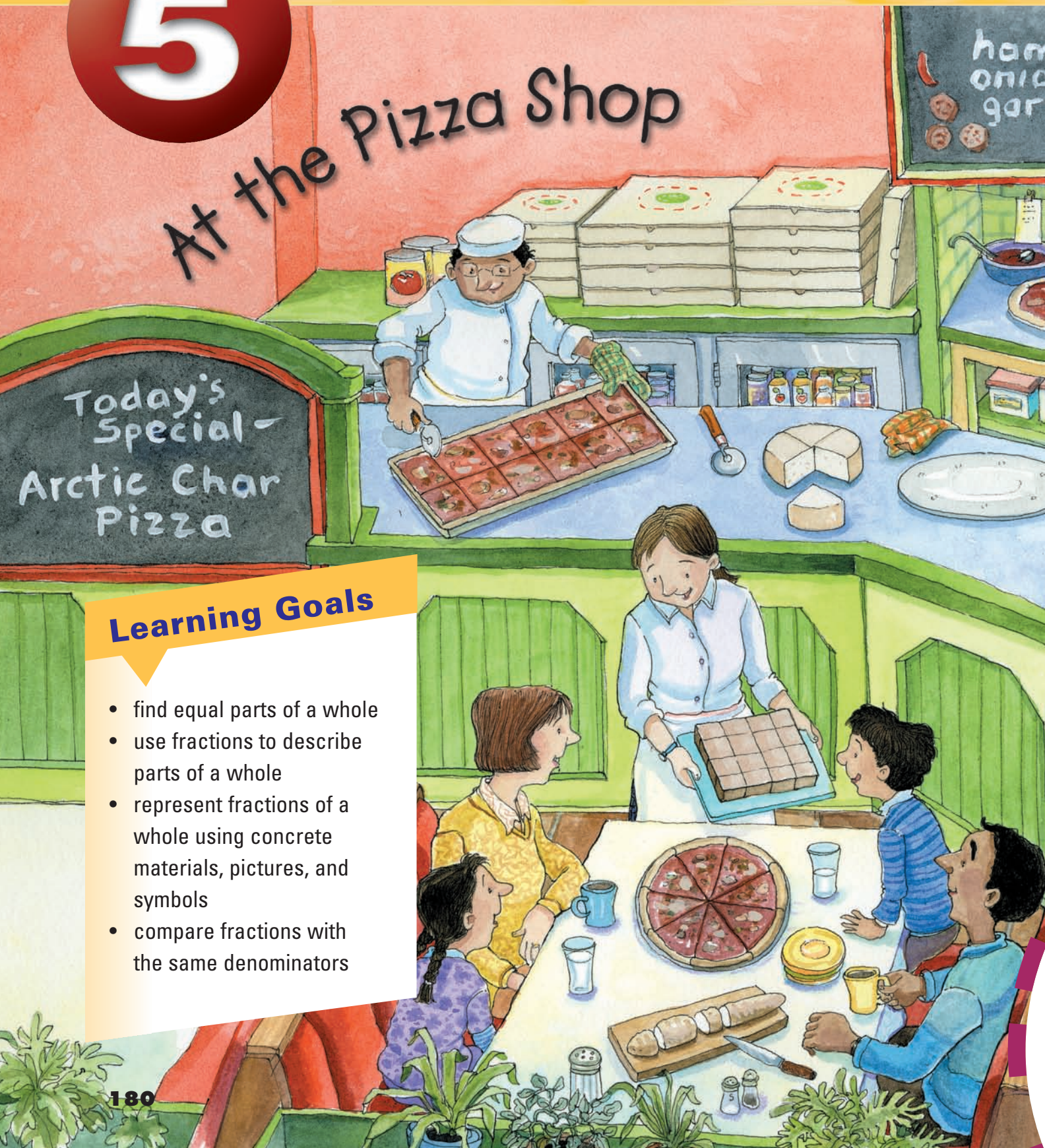
UNIT 5

Fractions



Learning Goals

- find equal parts of a whole
- use fractions to describe parts of a whole
- represent fractions of a whole using concrete materials, pictures, and symbols
- compare fractions with the same denominators

Key Words

- equal parts
- fractions
- halves
- thirds
- quarters/fourths
- fifths
- sixths
- sevenths
- eighths
- ninths
- tenths
- numerator
- denominator

Look at the scene in the pizza shop.

- What things can you find that show a whole cut into equal parts? How many equal parts are there?
- How do you know the parts are equal?

LESSON 1

Exploring Equal Parts

Think of sharing something with a classmate.
How can you make sure each of you gets a fair share?

Explore

You will need items like the ones in the picture.

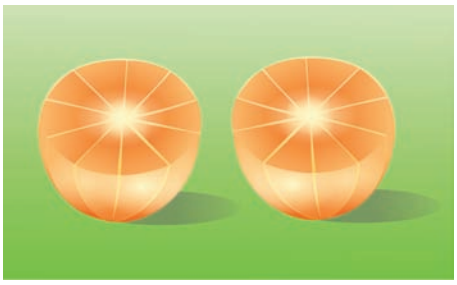
- Make a plan for sharing each item equally with your partner.
- Share each item.
- Use pictures and words to describe how you shared.

Show *and* Share

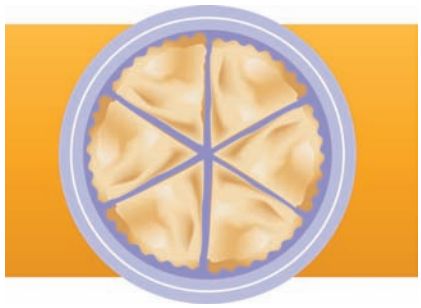
Talk about how you decided to make fair shares.
How did you check to make sure the pieces were equal?
How would you make 3 fair shares? 4 fair shares?

Connect

When we share, we can make **equal parts**.



This orange is divided into 2 equal parts. It shows equal shares for 2 friends.



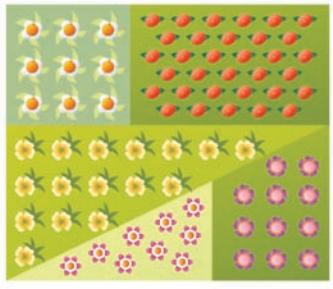
This pie is cut into 6 equal slices. It shows equal shares for 6 people.

Practice

1. Does each picture show equal parts? How do you know?

a)

b)



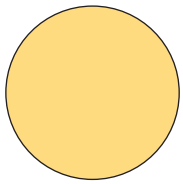
c)

Math Link

Social Studies

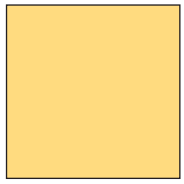
During the fur trade, French-Canadian voyageurs wore a sash, or *ceinture fléchée*, like this one. What patterns do you see in the sash?

2. Use a cutout of each shape.
Fold the shape to show equal parts.



2 equal parts

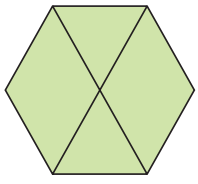
3 equal parts



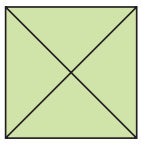
4 equal parts

3. Sort the pictures into 2 sets, those that show equal parts and those that do not. Use the letters to record your sorting.
How can you check if a picture shows equal parts?

Equal Parts	Not Equal Parts



A



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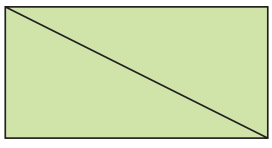

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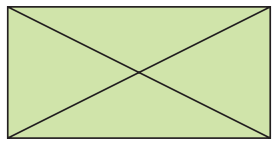

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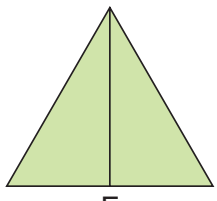

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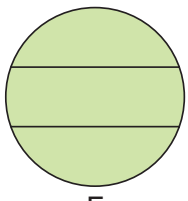

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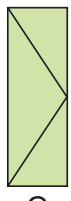
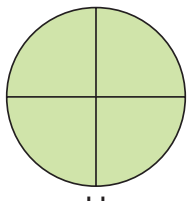


G



H

4. Draw a picture of a whole object divided into equal parts.
Use words to describe what your picture shows.

Reflect

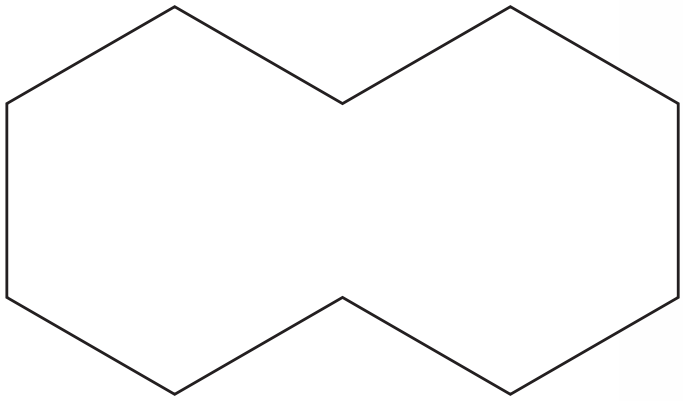
Describe a time when you or someone you know divided a whole into equal parts.
How did you make sure the parts were equal?

LESSON 2

Equal Parts of a Whole

Explore

You will need Pattern Blocks.



➤ How many ways can you cover this shape with Pattern Blocks to show equal parts? Tell about the equal parts each time. Record your work.

➤ Repeat the activity with a shape you make from Pattern Blocks.

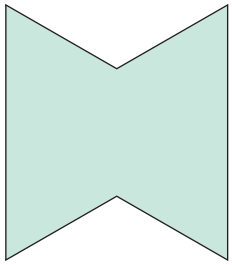
Colour of blocks	Number of blocks
blue	6

Show *and* Share

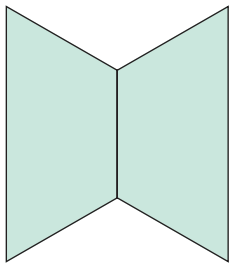
Share your work with another pair of classmates. Tell how you knew the parts were equal.

Connect

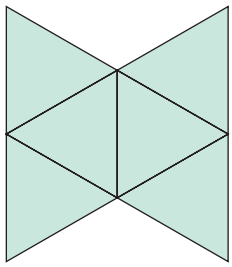
➤ This shape is **1 whole**.



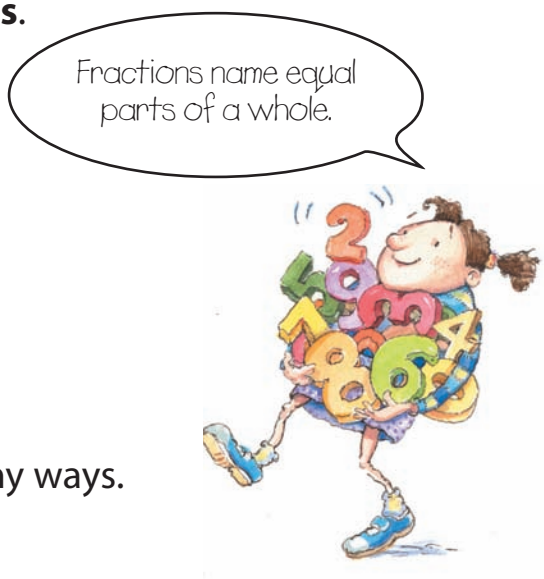
Here are some ways to divide the shape into equal parts.
You can name equal parts with **fractions**.



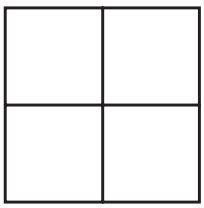
2 equal parts
2 halves

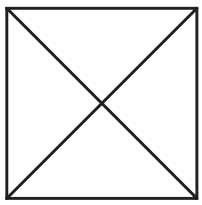


6 equal parts
6 sixths



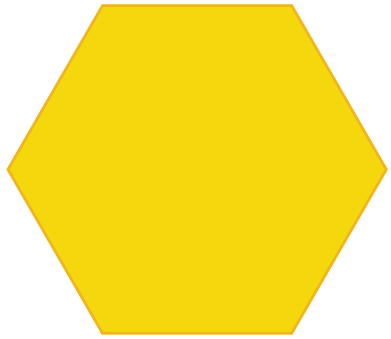
➤ You can show the same fractions in many ways.
Here are some ways to show **fourths** or **quarters** of 1 whole.





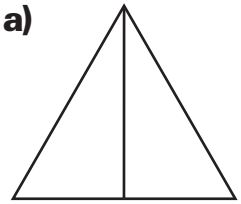
Practice

1. Use Pattern Blocks to show equal parts of this shape in 3 different ways.
Name the equal parts for each way.

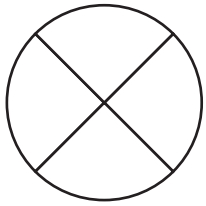


2. Name the equal parts.
Tell why you think they are equal parts.

a)



b)



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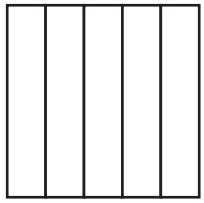
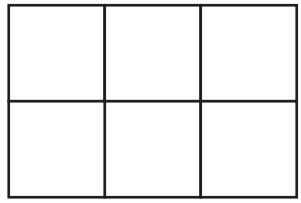
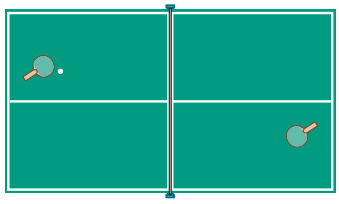


d)



3. Which picture shows equal parts?
Name the equal parts.

a)



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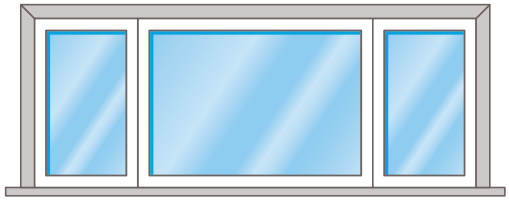
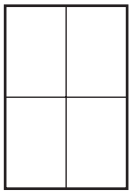


4. Tell whether each picture shows fourths.
How do you know when it shows fourths?
How do you know when it does not?

a)



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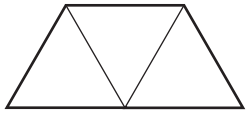
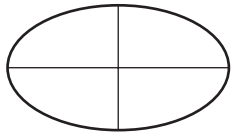


c)



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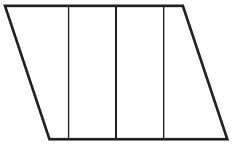
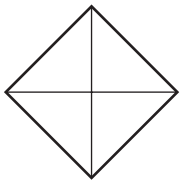


e)



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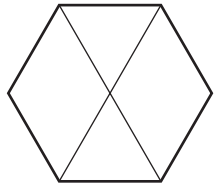
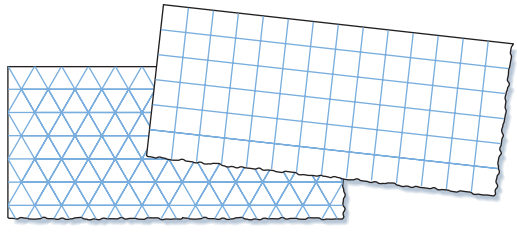


5. **a)** Draw a shape on grid paper.
Fold your shape to show halves.
b) Draw a shape to show fifths.
c) Draw a shape to show fourths.
How can you tell you have equal parts in each shape?

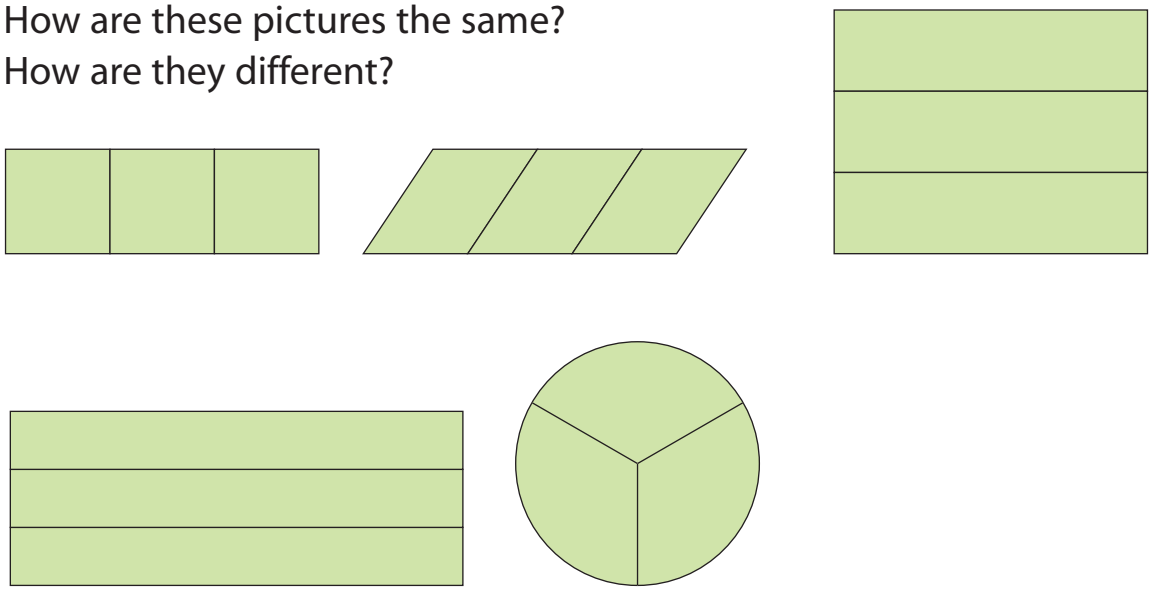


6. Imagine sharing a treat.
Do you get a bigger piece when you share with many friends or with only a few?
Show why your answer makes sense.

7. Describe 2 times when you have used fractions at home.
Explain how you used them.

8. Draw a picture to show equal parts.
Name the parts.
How can you show the parts are equal?

9. How are these pictures the same?
How are they different?



Reflect

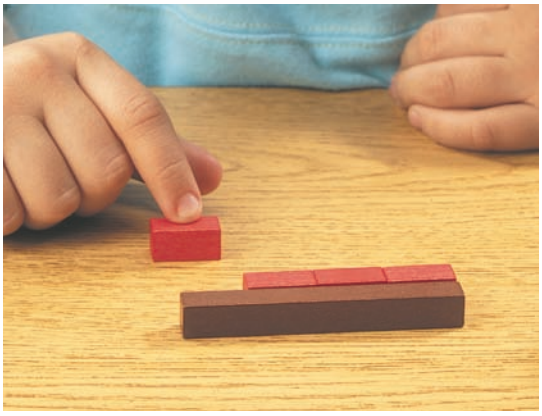
What is your favourite strategy when checking for equal parts?
How do you know your strategy works?

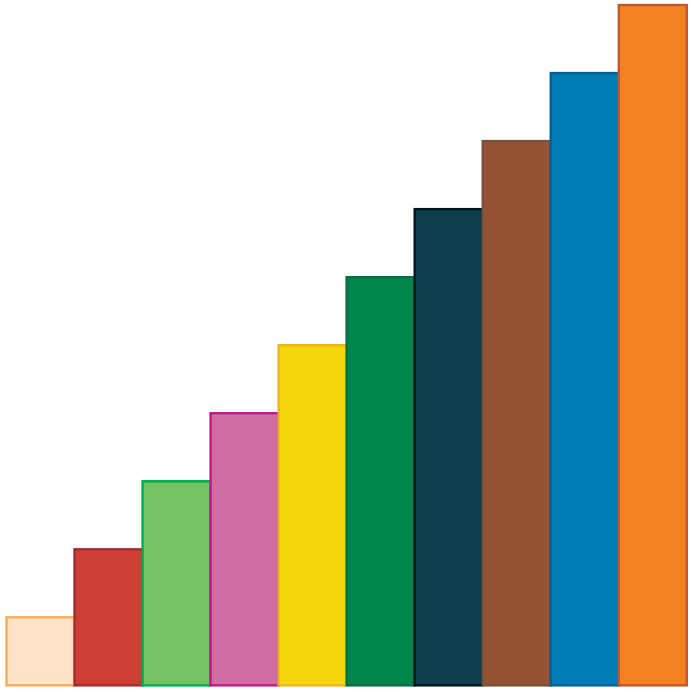
At Home

You have a pie to share at home. Show how to cut it so everybody gets an equal share.

LESSON 3

Fractions of a Whole





Sami is using different colours of rods to show fractions.

You can do the same thing using rods or strips of coloured paper.

Explore

You will need rods or paper strips.

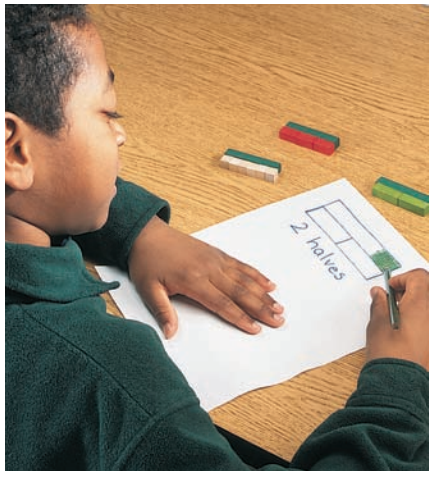
- Start with the orange rod.
  Use the other rods to find different fractions of the orange rod.
  How many ways can you do this?
  Draw pictures and label them to record your work.
- Repeat the activity. Start with the blue rod.

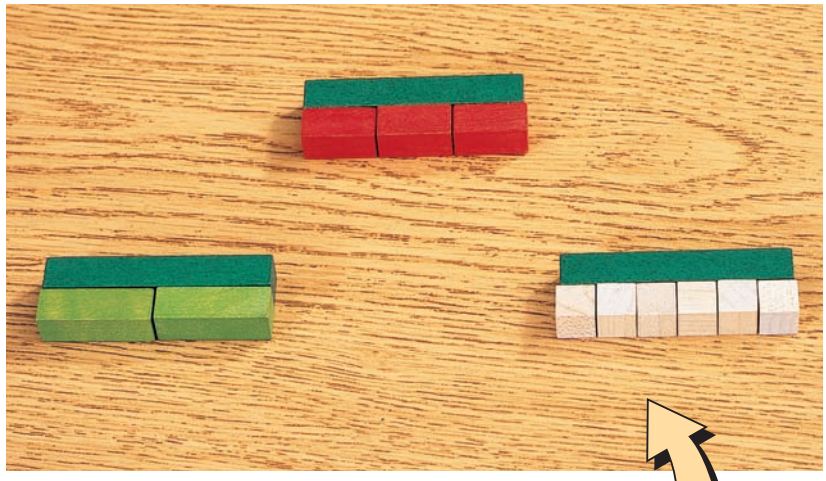
Show *and* Share

Show your pictures to another pair of classmates.
How did you find equal parts?
How can you be sure you found all the possible fractions?

Connect

➤ Here is how Carey showed fractions of the dark green rod.

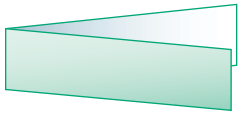




Carey knows the white rods are sixths because all of them are equal in length and there are 6 of them.

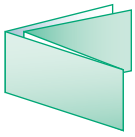
➤ You can fold a strip of paper to show fractions.

- Fold from end to end to show halves.



2 halves make 1 whole.

- Fold in half again to show fourths or quarters.



4 fourths make 1 whole.

- Fold in half again to show eighths.

8 eighths make 1 whole.

Once you fold the strip into equal parts, you can count the parts.

3 eighths 5 eighths

Practice

Use rods or paper strips when they help.

1. Which rod is 1 half of:

a) the brown rod?

b) the purple rod?

2. Which rod is 1 third of:

a) the light green rod?

b) the dark green rod?

3. Fold a sheet of paper into equal parts.
Name the parts.
Show a partner how you know the parts are equal.

4. What fraction of each strip is shaded?
What fraction is not shaded?

a)

b)

c)

d)

5. Draw and shade shapes to show:

a) 1 half **b)** 3 fourths **c)** 2 thirds

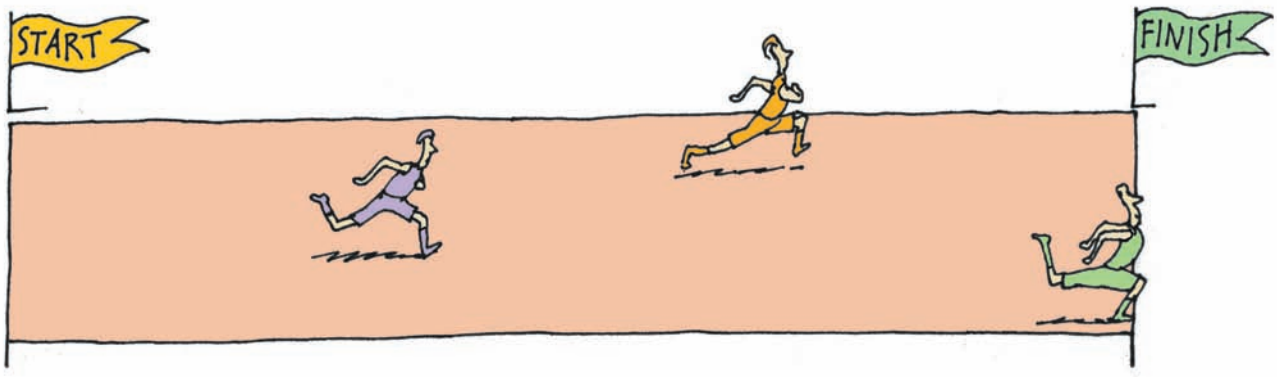
Use pictures, words, and numbers to tell how you knew

- how many parts to draw
- how many parts to shade

6. Both Jay and Amira had a strip of paper.
Each child folded the strip into equal parts.
Jay had twice as many equal parts as Amira.
Use paper strips to model some possible fractions they used.

7. Could 1 third ever be larger than 1 half?
Make some examples using paper strips or rods.
Use pictures and words to show your ideas.

8. About what fraction of the race has each person run? Explain.



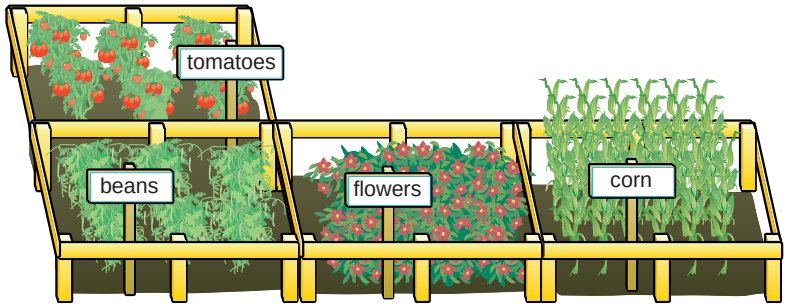
Reflect

Use pictures, words, or numbers to explain the fraction 2 fifths.

LESSON 4

Naming and Writing Fractions

This community garden has
4 equal parts.
3 fourths of the garden are
for growing food.



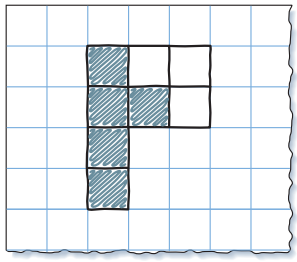
The fraction name suggests a symbol for writing the fraction.

$$\frac{3}{4}$$

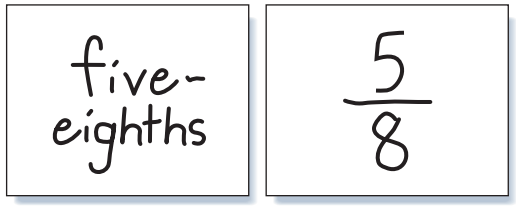
← 3
← of
← 4 equal parts are for growing food.

Explore

You will need grid paper, 10 blank cards, and scissors.
Make a fraction puzzle for your partner.



- Draw 5 different shapes on grid paper.
  Make each shape with a different number of squares.
  Cut the grid paper to separate the shapes.
- Colour a fraction of the squares on each shape.
- On one card, record the fraction using words.
- On another card, record the fraction using a symbol.



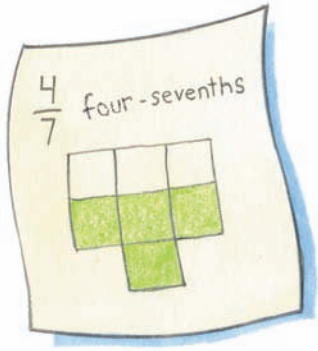
Show *and* Share

Mix up your shapes and cards. Trade with your partner.
Sort your partner's shapes and cards into 5 matching sets.
Check each other's work.

Connect

This shape has 7 squares,
so it shows sevenths.

Four of the 7 squares are coloured,
so the fraction is $\frac{4}{7}$.



$$\frac{4}{7}$$

← The **top number** of a fraction tells how many equal parts are counted.

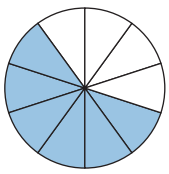
← The **bottom number** of a fraction tells how many equal parts are in the whole.

4 is the **numerator**.
7 is the **denominator**.

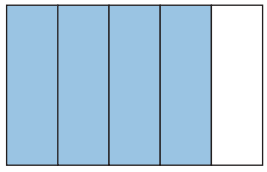
Practice

1. Use words and symbols. Write a fraction for the shaded part of each shape.

a)



b)



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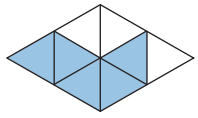

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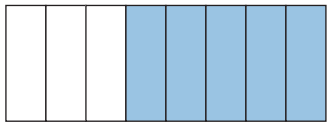

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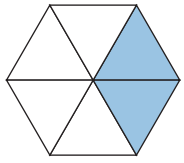


2. Choose 1 part from question 1.
Name the denominator. Explain what it means.
Name the numerator. Explain what it means.

3. How are the fractions in each set the same?
How are they different?

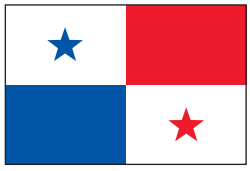
a) $\frac{3}{8}, \frac{1}{8}, \frac{6}{8}, \frac{4}{8}$ **b)** $\frac{5}{6}, \frac{2}{5}, \frac{5}{5}, \frac{3}{5}$ **c)** $\frac{4}{8}, \frac{4}{6}, \frac{4}{5}, \frac{4}{10}$

4. Sort these fractions into 2 sets: $\frac{5}{12}, \frac{2}{5}, \frac{3}{12}, \frac{1}{2}, \frac{7}{12}, \frac{4}{6}, \frac{1}{3}, \frac{11}{12}$

Explain your sorting rule.
Sort again, and explain your rule.

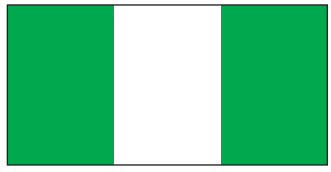
5. Kia's after-school centre is having a flag day to celebrate the children's different cultures.
Use fractions to describe each of these flags.

a)



Panama

b)



Nigeria

c)

Papua New Guinea

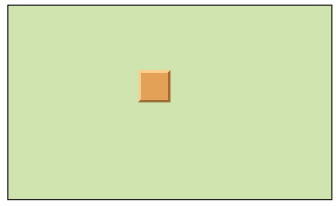
6. Draw a flag for each description.

a) $\frac{2}{3}$ yellow and $\frac{1}{3}$ blue

b) $\frac{2}{5}$ white, $\frac{1}{5}$ green, and $\frac{2}{5}$ black

Pick 1 of your answers. Describe how you used the fractions to draw your flag.

7. Ms. Chung has finished $\frac{1}{4}$ of her patio.
Use grid paper.
Draw a picture to show what the whole patio might look like.
Show 3 different ways you can do this.



Reflect

Show a fraction on grid paper. Name the fraction.
Use your picture to explain the meaning of *numerator* and *denominator*.

Three in a Row

You will need game boards, fraction cards, and counters.

The object of the game is to get 3 of your counters in a row in any direction.

- Players choose a game board.
- Shuffle the fraction cards and place them face down on the table.
- Player A draws a card and names the fraction.
- Any player who has that fraction on her game board covers the square with a counter.
- Players take turns to draw a card and name the fraction.
- The first player to get 3 counters in a row in any direction wins.

LESSON 5

Comparing Fractions

What fraction of the yellow Pattern Block is the red block? The blue block? The green block?
How do you know?

Explore

You will need Pattern Blocks.

Use the yellow Pattern Block as 1 whole.
Use other Pattern Blocks to make fractions.
Which fraction in each pair is greater?

$\frac{2}{3}$ and $\frac{1}{3}$

$\frac{1}{2}$ and $\frac{2}{2}$

$\frac{5}{6}$ and $\frac{3}{6}$

$\frac{1}{6}$ and $\frac{4}{6}$

$\frac{2}{3}$ and $\frac{3}{3}$

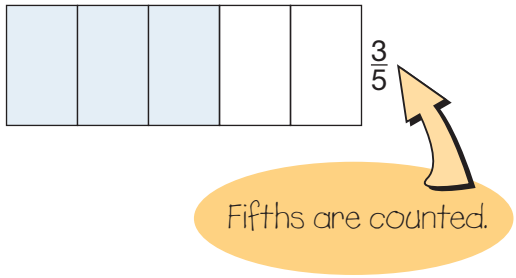
$\frac{6}{6}$ and $\frac{2}{6}$

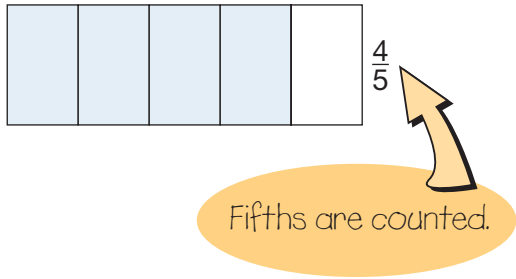
Show *and* Share

Share your work with another pair of classmates.
How did you know which fraction in each pair was greater?

Connect

➤ When comparing fractions with the same denominator, look at the numerator.

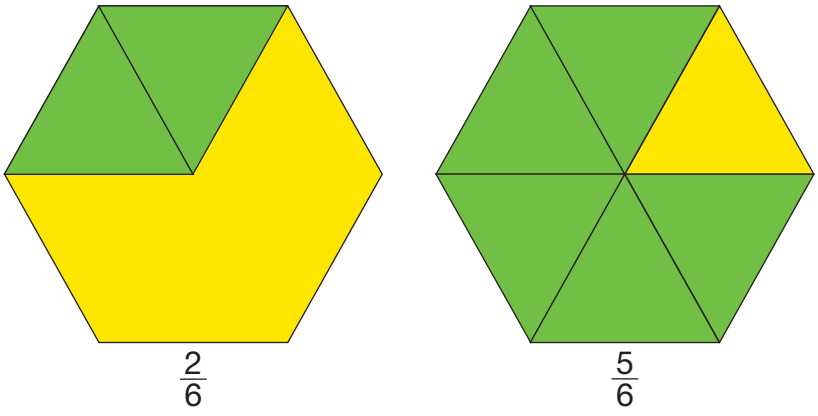




$\frac{3}{5}$ has fewer fifths than $\frac{4}{5}$.
So, $\frac{3}{5} < \frac{4}{5}$.

$\frac{4}{5}$ has more fifths than $\frac{3}{5}$.
So, $\frac{4}{5} > \frac{3}{5}$.

➤ Here is one way to compare $\frac{2}{6}$ and $\frac{5}{6}$.
Model each fraction with Pattern Blocks.



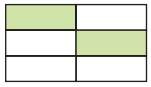
Count the number of parts in each fraction.
2 parts are fewer than 5 parts.
So, $\frac{2}{6} < \frac{5}{6}$.

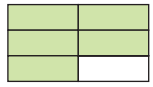
5 parts are more than 2 parts.
So, $\frac{5}{6} > \frac{2}{6}$.

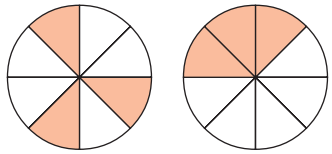
Practice

1. Look at each pair of shapes.
Write fractions to compare the shaded parts.
Use $>$, $<$, or $=$.

a) 

b) 

c) 



2. Use grid paper.
Draw and shade shapes to show which is greater.

a) $\frac{2}{3}$ or $\frac{1}{3}$ **b)** $\frac{4}{5}$ or $\frac{5}{5}$ **c)** $\frac{3}{4}$ or $\frac{2}{4}$

3. Draw pictures to show which is greater.

a) $\frac{5}{8}$ or $\frac{3}{8}$ **b)** $\frac{2}{2}$ or $\frac{1}{2}$ **c)** $\frac{2}{6}$ or $\frac{5}{6}$

4. Use the red Pattern Block as 1 whole.
Show which fraction is greater, $\frac{2}{3}$ or $\frac{3}{3}$.

5. Malka and Binda took part in a 3-day canoe trip.
The first day Malka travelled $\frac{4}{10}$ of the total distance and Binda travelled $\frac{3}{10}$ of the total distance.
Who travelled the greater distance?
Draw a picture to show how you know.

6. On Tuesday, the Polar Bears hockey team practised for $\frac{7}{12}$ of an hour, and the Timber Wolves practised for $\frac{9}{12}$ of an hour.
Which team spent more time practising?
How do you know?

Reflect

Choose 2 different fractions with the same denominator.
Draw pictures to show a friend how to compare them.

LESSON 6

Strategies Toolkit

Explore

Amalie and Danny each have a sheet of coloured paper from the same pad.
Amalie cuts her piece into fourths.
Danny cuts his piece into sixths.
Who has larger pieces?

Show *and* Share

Describe how you solved the problem.

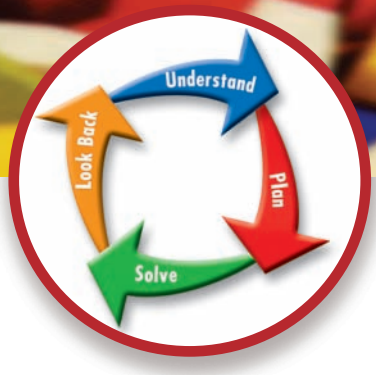
Connect

Sébastien is making a picture with square tiles.
He has finished two-fifths of his picture.

What might be the shape of his finished picture?

Strategies

- Make a chart.
- Use a model.
- Draw a picture.
- Solve a simpler problem.
- Work backward.
- Guess and test.
- Make an organized list.
- Use a pattern.



What do you know?

- The square tiles are all the same size.
- Two-fifths of his picture is finished.

Think of a strategy to help you solve the problem.

- You can **use a model**.
- Choose materials to represent the square tiles.

Use your materials to model what Sébastien is doing.

- How many square tiles has he used so far?
- How many will he use altogether?

Show 3 different ways to solve the problem.

Practice

Choose one of the **Strategies**

1. Dusaka coloured a rectangle $\frac{1}{8}$ blue, $\frac{3}{8}$ green, and the rest orange.
   What fraction of the rectangle is orange?

2. Show how you can divide a square into 2 equal pieces.
   Find at least 2 ways.

Reflect

Write about a time when you might want to find a fraction of a whole.
Use pictures, numbers, or words to explain.

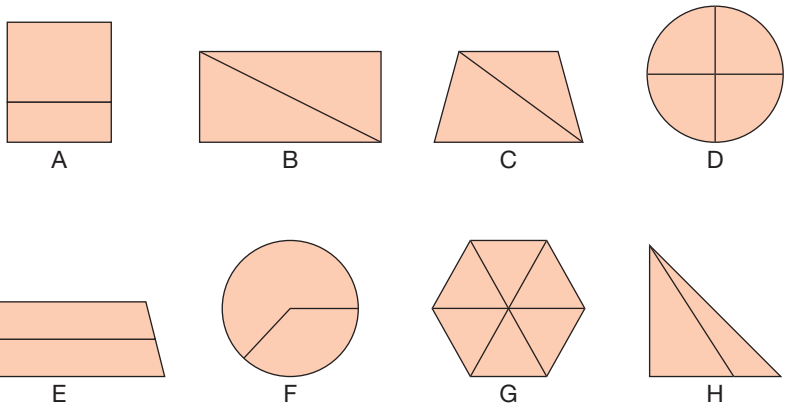
Unit 5 Show What You Know

LESSON

1

1. Sort the pictures into 2 sets, those that show equal parts and those that do not. Use the letters to record your sorting.

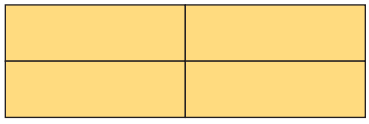
Equal Parts	Not Equal Parts



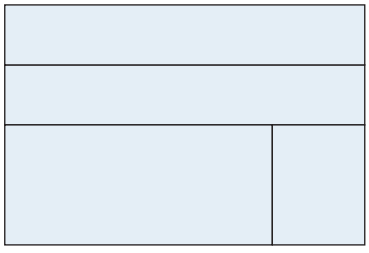
2

2. Which pictures show fourths? Which do not? How do you know?

a)



b)



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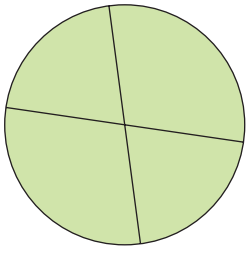

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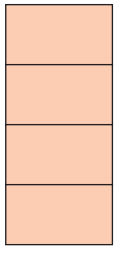


3

3. Fold a paper strip to show sixths.

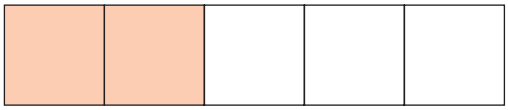
a) Colour 1 sixth of the strip.

b) What fraction of the strip is **not** coloured?

LESSON 4

4. Use symbols and words.
Write a fraction for each shaded part.
Write a fraction for each unshaded part.

a)



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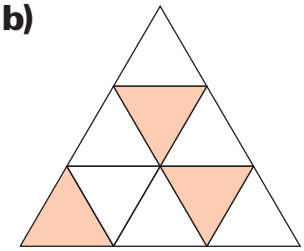

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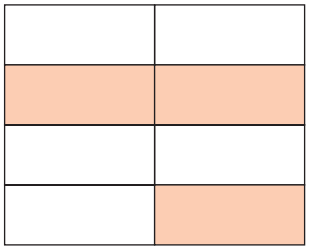


5. Draw a rectangle for each description.

a) $\frac{1}{3}$ blue and $\frac{2}{3}$ red

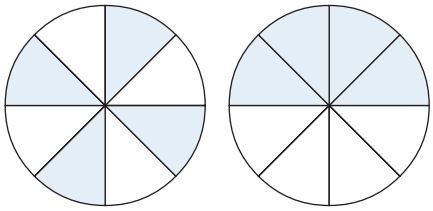
b) $\frac{1}{4}$ yellow, $\frac{1}{4}$ green, and $\frac{2}{4}$ blue

c) $\frac{1}{8}$ orange, $\frac{3}{8}$ black, and the rest green
What fraction is green?

LESSON 5

6. Write fractions to compare the shaded parts. Use $>$, $<$, or $=$.

a)



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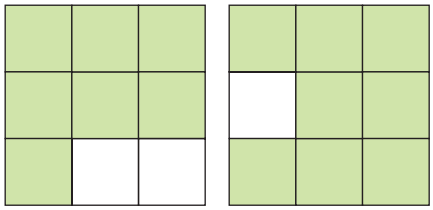

UNIT 5 **Learning Goals**

- ☑ find equal parts of a whole
- ☑ use fractions to describe parts of a whole
- ☑ represent fractions of a whole using concrete materials, pictures, and symbols
- ☑ compare fractions with the same denominators

Unit Problem

At the Pizza Shop

You have been hired to make pizzas at the local pizza shop.

Part 1

Look at the pizza orders.
Use cutouts to model each pizza.
Make sure each pizza is cut into equal pieces.
Draw the toppings on the pizzas.
Use fractions to describe the parts of each pizza.

Check List

Your work should show

- ☑ models of the different pizzas split into equal portions
- ☑ the fractions that describe the pizzas
- ☑ correct math language and symbols used to record answers

Part 2

Design your own pizza.
Cut it into as many equal pieces as you want.
Use any toppings you like.
Use fractions to describe your pizza.

Part 3

Sarah, Kon, and Nigel ordered a rectangle pizza with 12 slices.
Sarah ate 4 pieces and Kon and Nigel each ate 3 pieces.
Draw a picture to model the pizza.
Use fractions to tell how much of the pizza each person ate, and how much pizza was left over.

Reflect on Your Learning

Write about 1 important thing you learned about fractions.
Explain why it is important to know this.