Representing Percents

4.1

***MathLinks 8*, pages 122–129**

Suggested Timing
80–100 minutes

Materials
- a variety of food and drink labels with information about percents
- hundred grids
- coloured pencils
- camera attached to a television monitor (optional)
- several pictures of the same kind of fruit or other food item (optional)
- base ten blocks (optional)

Blackline Masters
Master 2 Two Stars and One Wish
Master 10 Hundred Grids
BLM 4–3 Chapter 4 Warm-Up
BLM 4–5 Section 4.1 Extra Practice
BLM 4–6 Section 4.1 Math Link

Mathematical Processes
- ☑ Communication (C)
- ☑ Connections (CN)
- ☑ Mental Mathematics and Estimation (ME)
- ☑ Problem Solving (PS)
- ☑ Reasoning (R)
- ☑ Technology (T)
- ☑ Visualization (V)

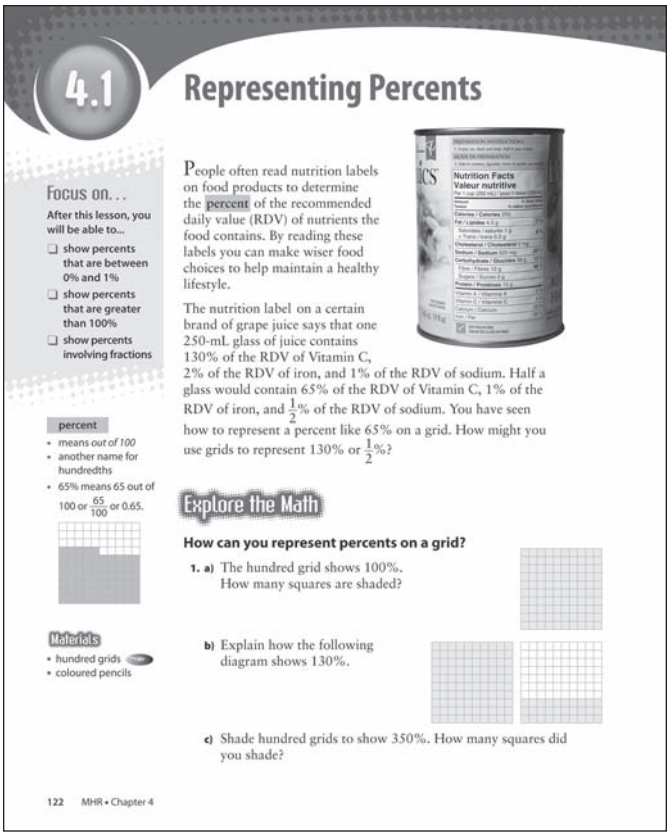
Specific Outcomes
N3 Demonstrate an understanding of percents greater than or equal to 0%.

Category	Question Numbers
Essential (minimum questions to cover the outcomes)	1–4, 6, 8, 9, 12, Math Link
Typical	1–4, 6, 9–15, Math Link
Extension/Enrichment	1–3, 9, 13–16, Math Link

Planning Notes

Have students complete the warm-up questions on **BLM 4–3 Chapter 4 Warm-Up** to reinforce material learned in previous sections.

As a class, read and discuss the nutrition labels. Ask students to share other real-life examples of where percents are used and ways they have been represented. Since section 4.1 focuses on representing


4.1 Representing Percents

Focus on...
After this lesson, you will be able to...
- show percents that are between 0% and 1%
- show percents that are greater than 100%
- show percents involving fractions

People often read nutrition labels on food products to determine the percent of the recommended daily value (RDV) of nutrients the food contains. By reading these labels you can make wiser food choices to help maintain a healthy lifestyle.

The nutrition label on a certain brand of grape juice says that one 250-mL glass of juice contains 130% of the RDV of Vitamin C, 2% of the RDV of iron, and 1% of the RDV of sodium. Half a glass would contain 65% of the RDV of Vitamin C, 1% of the RDV of iron, and $\frac{1}{2}$% of the RDV of sodium. You have seen how to represent a percent like 65% on a grid. How might you use grids to represent 130% or $\frac{1}{2}$%?

percent
- means *out of 100*
- another name for hundredths
- 65% means 65 out of 100 or $\frac{65}{100}$ or 0.65.

Explore the Math

How can you represent percents on a grid?

1. a) The hundred grid shows 100%. How many squares are shaded?

b) Explain how the following diagram shows 130%.

Materials
- hundred grids
- coloured pencils

c) Shade hundred grids to show 350%. How many squares did you shade?

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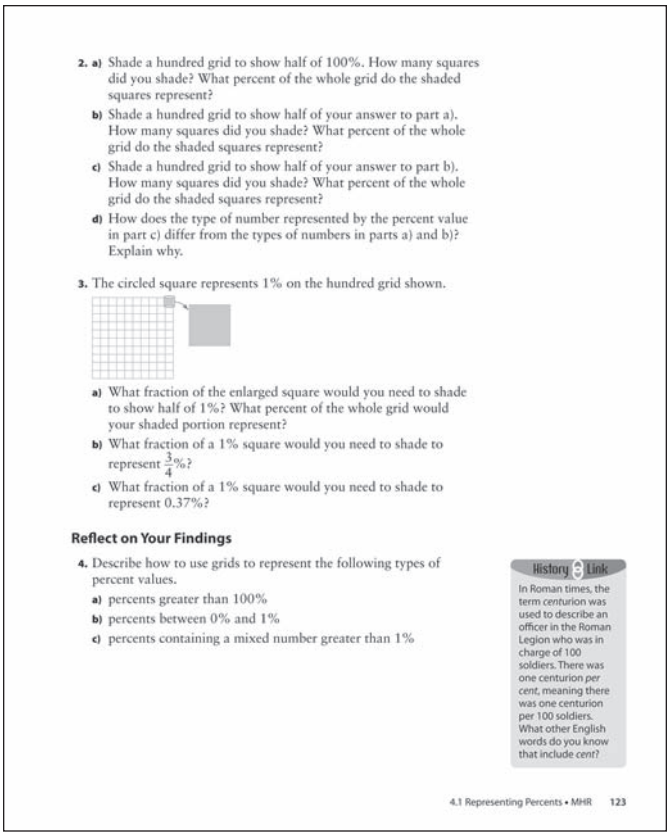
percents visually, help students recall representing numbers and fractions on grids. Focus on shading hundred grids to represent values. Consider asking students to explain what 25, 50, 130, and $\frac{1}{2}$ might look like represented on hundred grids.

Explore the Math

In this exploration, students represent percents using hundred grids.

Method 1 Students should work in pairs. Students will need coloured pencils and **Master 10 Hundred Grids**. Ask students to explain the meaning of the terms *zooming in* and *zooming out*. Many students will be familiar with these terms as they relate to computer mapping and using digital cameras with zoom features and lenses. Use their familiarity with these terms to help students make connections with mathematical representations of small and large percents. Relate percents greater than 100% to zooming out on a picture and percents between 0% and 1% to zooming in on a picture. Question 3



2. a) Shade a hundred grid to show half of 100%. How many squares did you shade? What percent of the whole grid do the shaded squares represent?
b) Shade a hundred grid to show half of your answer to part a). How many squares did you shade? What percent of the whole grid do the shaded squares represent?
c) Shade a hundred grid to show half of your answer to part b). How many squares did you shade? What percent of the whole grid do the shaded squares represent?
d) How does the type of number represented by the percent value in part c) differ from the types of numbers in parts a) and b)? Explain why.

3. The circled square represents 1% on the hundred grid shown.

a) What fraction of the enlarged square would you need to shade to show half of 1%? What percent of the whole grid would your shaded portion represent?
b) What fraction of a 1% square would you need to shade to represent $\frac{3}{4}$%?
c) What fraction of a 1% square would you need to shade to represent 0.37%?

Reflect on Your Findings

4. Describe how to use grids to represent the following types of percent values.
a) percents greater than 100%
b) percents between 0% and 1%
c) percents containing a mixed number greater than 1%

History Link

In Roman times, the term *centurion* was used to describe an officer in the Roman Legion who was in charge of 100 soldiers. There was one centurion *per cent*, meaning there was one centurion per 100 soldiers. What other English words do you know that include *cent*?

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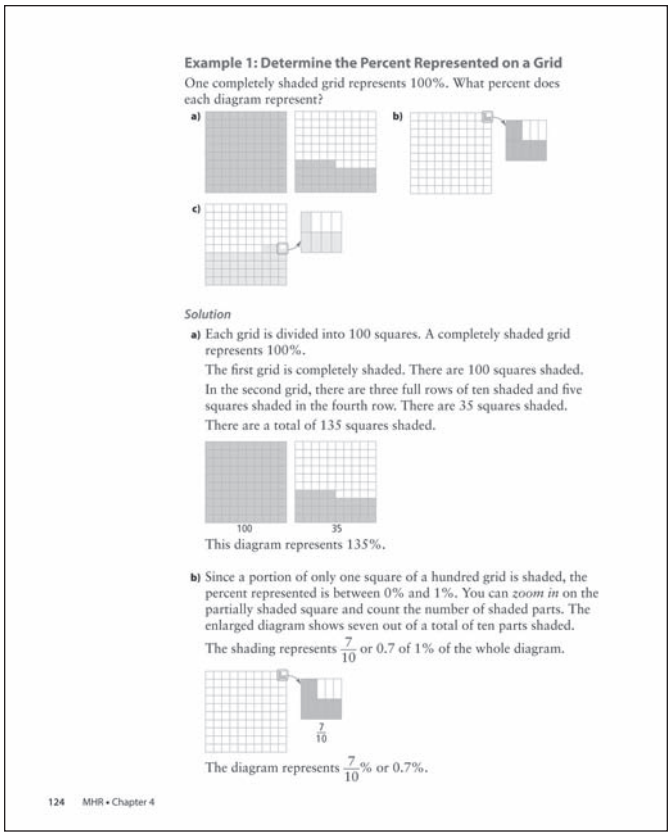

Example 1: Determine the Percent Represented on a Grid

One completely shaded grid represents 100%. What percent does each diagram represent?

a) b) c)

Solution

a) Each grid is divided into 100 squares. A completely shaded grid represents 100%.
The first grid is completely shaded. There are 100 squares shaded.
In the second grid, there are three full rows of ten shaded and five squares shaded in the fourth row. There are 35 squares shaded.
There are a total of 135 squares shaded.

100 35

This diagram represents 135%.

b) Since a portion of only one square of a hundred grid is shaded, the percent represented is between 0% and 1%. You can *zoom in* on the partially shaded square and count the number of shaded parts. The enlarged diagram shows seven out of a total of ten parts shaded.
The shading represents $\frac{7}{10}$ or 0.7 of 1% of the whole diagram.

$\frac{7}{10}$

The diagram represents $\frac{7}{10}$% or 0.7%.

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shows the concept of zooming in on one square of a hundred grid to represent fractions of percents. You might show the concept of zooming out by using multiple grids to represent a percent greater than 100%.

Method 2 Work with the entire class to demonstrate the effect of zooming in and out using a video camera attached to a television monitor. Discuss which view provides the largest overall picture, and which provides small details. Compare the small details to percents less than 1% and the large overall picture to percents greater than 100%. Have students use coloured pencils and **Master 10 Hundred Grids** to replicate the percents shown in the Explore the Math, then have them try some additional percents on their own before answering the questions in the Explore the Math.

Method 3 Show students a visual of one piece of fruit or other food item, and ask them what percent you are displaying (100%). Then, show them a visual of $1\frac{1}{2}$ pieces of the same fruit and challenge them to explain how to describe that as a percent. Encourage discussion as students come to terms with something that is greater than 100%. Next show them a minuscule amount of the same item and ask what percent that is. Again, encourage students to consider that there may be percents less than one. With these new ideas, have them work in small groups on the Explore the Math. Circulate and challenge students with additional percents as you see they are starting to get the idea or need something else to think about.

Read and discuss the History Link. Ask students for English words that include *cent*. Possible answers include century, cents (pennies), and centimetre. Have students discuss their findings as a class.

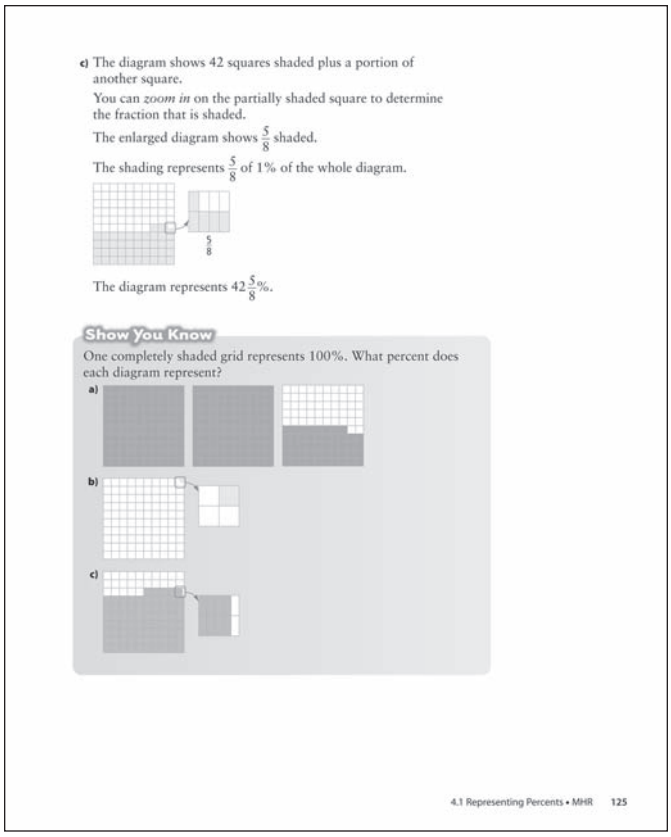
Example 1

Example 1 shows students how to identify percents less than 1% and greater than 100% that are represented on hundred grids. You may wish to have students shade their own hundred grids to replicate these questions, and then shade another different one for each type, trade that with a partner, and identify the percent shown on each other's grids.

Example 2

Example 2 shows students how to transform a statement into a mathematical statement, and then represent the statement using hundred grids. Discuss the meaning of fractional percent; have students show an example on a hundred grid.

Help students focus on the parts of each statement that are crucial to the mathematical representation. Provide students with **Master 10 Hundred Grids** to help them complete the Show You Know.



c) The diagram shows 42 squares shaded plus a portion of another square.

You can *zoom in* on the partially shaded square to determine the fraction that is shaded.

The enlarged diagram shows $\frac{5}{8}$ shaded.

The shading represents $\frac{5}{8}$ of 1% of the whole diagram.

$\frac{5}{8}$

The diagram represents $42\frac{5}{8}$%.

Show You Know

One completely shaded grid represents 100%. What percent does each diagram represent?

a)

b)

c)

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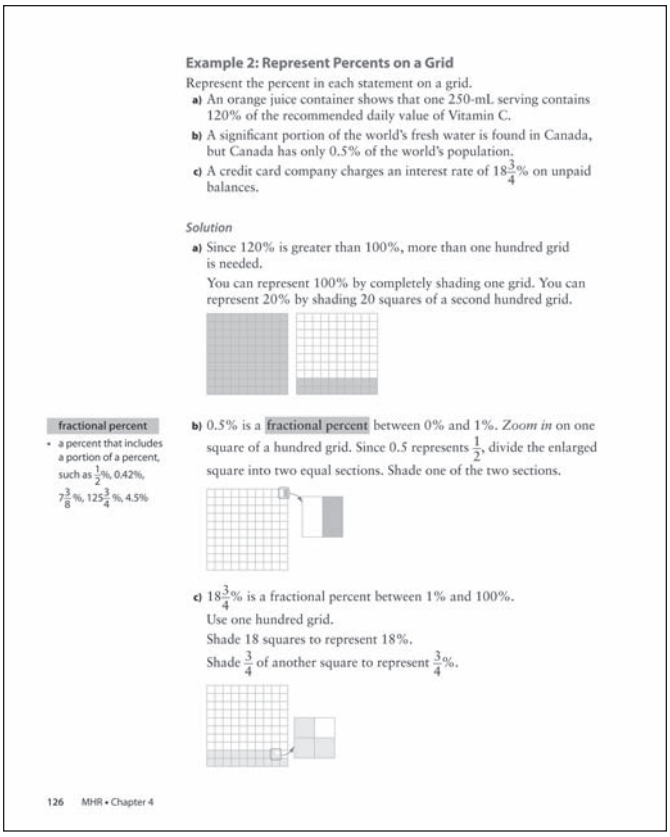

Example 2: Represent Percents on a Grid

Represent the percent in each statement on a grid.

a) An orange juice container shows that one 250-mL serving contains 120% of the recommended daily value of Vitamin C.

b) A significant portion of the world's fresh water is found in Canada, but Canada has only 0.5% of the world's population.

c) A credit card company charges an interest rate of $18\frac{3}{4}$% on unpaid balances.

Solution

a) Since 120% is greater than 100%, more than one hundred grid is needed.

You can represent 100% by completely shading one grid. You can represent 20% by shading 20 squares of a second hundred grid.

fractional percent

- a percent that includes a portion of a percent, such as $\frac{1}{2}$%, 0.42%, $7\frac{3}{8}$%, $125\frac{3}{4}$%, 4.5%

b) 0.5% is a fractional percent between 0% and 1%. *Zoom in* on one square of a hundred grid. Since 0.5 represents $\frac{1}{2}$, divide the enlarged square into two equal sections. Shade one of the two sections.

c) $18\frac{3}{4}$% is a fractional percent between 1% and 100%.

Use one hundred grid.

Shade 18 squares to represent 18%.

Shade $\frac{3}{4}$ of another square to represent $\frac{3}{4}$%.

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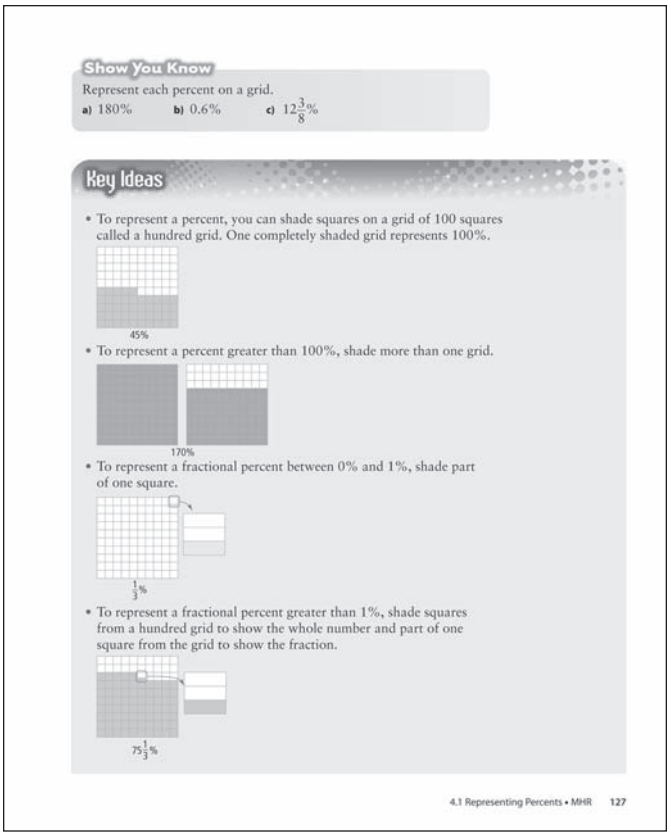
Meeting Student Needs

- Consider having students explore nutrition labels on food products that you collect in advance, and practise reading percents and converting percents to fractions and decimals.
- Some students may struggle with the concept of percents between 0% and 1%. Discuss how 65% and 0.65% are different quantities. Explain that 65% is $\frac{65}{100}$. It is between 1% and 100%, while 0.65% is $\frac{65}{1000}$ and is less than 1%. Compare these two percents using hundred grids.

  Ask students which of the following percents are between 1% and 100%: 0.5%, 15%, 0.34%, $\frac{3}{4}$%, 45%, $\frac{7}{8}$%, and 86%. Have them answer as a class using thumbs up or thumbs down. Repeat the activity and ask which of the following percents are between 0% and 1%: 33%, $\frac{1}{2}$%, 0.73%, 73%, 0.92%, 56%, and 0.22%.
- Some students may struggle with percents between 0% and 1% that are composed of fractions or decimals. Explain that a percent can be composed of a fraction or a decimal, but that it is still a percent. Explain that a decimal or a fraction is a percent if it has a percent symbol. Show examples of these types of percents such as $\frac{1}{2}$% and 0.5%.
- Concrete and kinesthetic learners may benefit from using counters and square grids to build representations of percents in a more hands-on manner.
- Students with motor difficulties may benefit from using counters and large block versions of grid paper to represent percents on a grid.
- Some students may benefit from being shown a way to remember when to use more than one grid and when to use an enlargement of one square. For example, show that 135% is represented by more than one grid. Explain that the 0 in 0.35% indicates using an enlargement of one square, and then show the representation.
- Some students may struggle to process the information and the instructions. Consider dividing the lesson into three topics. Start with percents greater than 100%. Have students represent these on hundred grids and then do some related questions. Then, teach percents between 0% and 1%, have students represent them on enlarged hundred grids, and do some related questions. Finally, teach percents containing a mixed number greater than 1%, have students show these on hundred grids, and do some related questions. You can then have students do the mixed practice in the Check Your Understanding.



Show You Know

Represent each percent on a grid.

a) 180% b) 0.6% c) $12\frac{3}{8}\%$

Key Ideas

- To represent a percent, you can shade squares on a grid of 100 squares called a hundred grid. One completely shaded grid represents 100%.

45%

- To represent a percent greater than 100%, shade more than one grid.

170%

- To represent a fractional percent between 0% and 1%, shade part of one square.

$\frac{1}{3}\%$

- To represent a fractional percent greater than 1%, shade squares from a hundred grid to show the whole number and part of one square from the grid to show the fraction.

$75\frac{1}{3}\%$

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- In #3c), prompt students that 0.37 is the same as $\frac{37}{100}$, so 0.37% is the same as $\frac{37}{100}$ of an enlarged square. This is a zoomed-in view. Confirm that 0.37% is actually $\frac{37}{1000}$.

ELL

- Ensure that students understand the terms *nutrition labels*, *recommended daily value*, *vitamin*, *iron*, *sodium*, *minerals*, *grid*, *squares*, and *shaded*.
- In #4c), recall the term *mixed number*. A mixed number is written as a whole number and a fraction. Provide some examples using the percents greater than 100% you have been discussing.

Common Errors

- Some students may not understand that 100% is equivalent to one whole.

R$_x$ Emphasize that a whole hundred grid represents one, which is the same as 100%. Show a hundred grid and emphasize that each small square represents 1% of the whole grid and that the grid shows 100 parts of 1 large square.

- Some students may think that 0.5 should be represented by 5 squares.

R$_x$ Show students that 0.5 is equivalent to $\frac{1}{2}$ of a single square on a hundred grid.

Answers

Explore the Math

1. a) 100

b) The completely shaded hundred grid represents 100%, and the hundred grid with 30 squares shaded represents 30%. Together, the grids represent 130%.

c) 350 squares

2. a) 50 squares; 50%

b) 25 squares; 25%

c) 12.5; 12.5%

d) The number of squares shaded in a) and b) are whole numbers. The number of squares shaded in c) is a decimal.

3. a) $\frac{1}{2}$; $\frac{1}{2}\%$ **b)** $\frac{3}{4}$ **c)** $\frac{37}{100}$

4. a) You will need more than one hundred grid. For example, to represent 234%, completely shade two hundred grids and then 34 squares on a third hundred grid.

b) For percents between 0% and 1%, you will need to shade only a portion of one square on a hundred grid. For example, to represent $\frac{1}{4}\%$, shade one fourth of one square on a hundred grid.

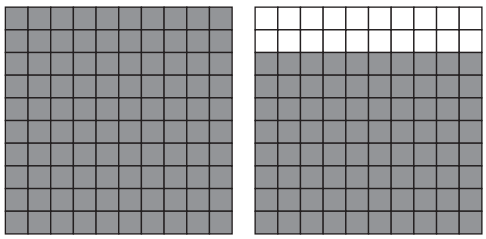
c) You will need to shade some whole squares, plus a portion of a square. For example, to represent $12\frac{1}{5}\%$, shade 12 squares on a hundred grid plus one fifth of one square on the same grid.

Show You Know: Example 1

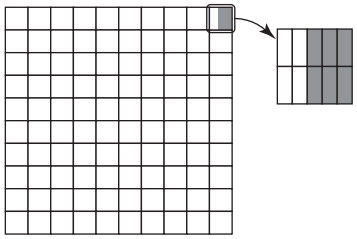
a) 248% **b)** $\frac{1}{4}\%$ **c)** $74\frac{8}{10}\%$

Show You Know: Example 2

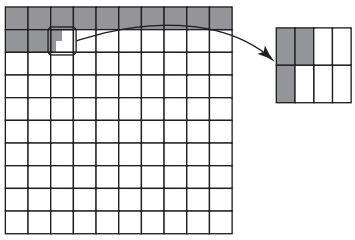
a)



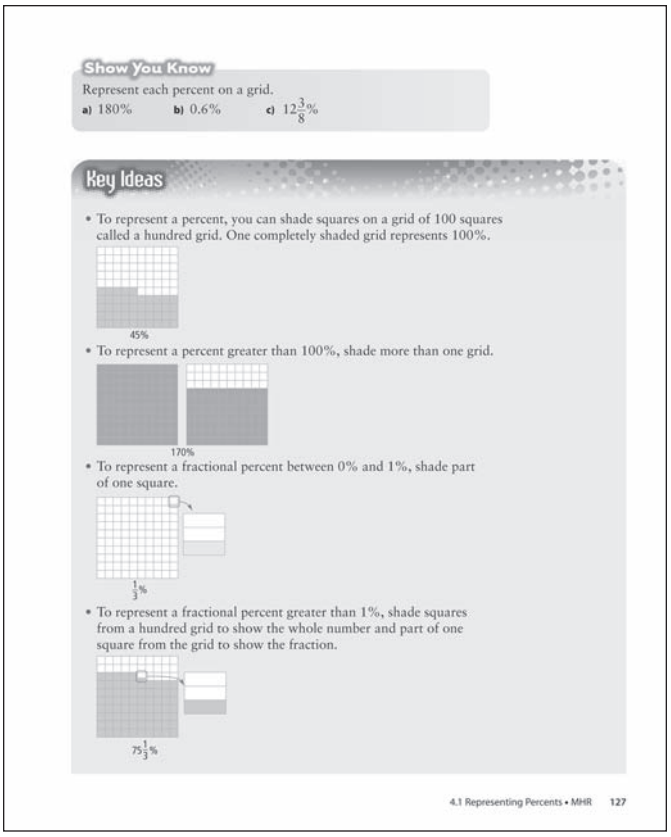
b)



c)



Assessment	Supporting Learning
Assessment *as* Learning	
Reflect on Your Findings Listen as students discuss what they discovered during the Explore the Math. Try to have them generalize the conclusion about their findings. Ask students to explain how they know how many hundred grids are needed to show a particular percent.	• Show students how the hundreds place determines the number of hundred grids needed to represent percents greater than 100%. • Some students may benefit from using base ten blocks or hundred grids to represent percents greater than 100%. Doing so will help them to visualize the number of hundred grids needed. • Show students who are struggling with representing less than 1% how to use a hundred grid to represent an enlarged square of one unit or 1%. Have students shade the appropriate number of units to show their understanding. • Have concrete and kinesthetic learners put 100 hundred grids together into one giant grid. Each separate hundred grid can represent 1% of the entire large grid. Work with parts of the individual hundred grid to show fractions of the whole such as 0.1%, 0.5%, and 0.37%.
Assessment *for* Learning	
Example 1 Have students do the Show You Know related to Example 1.	• Encourage students to verbalize their thinking. • You may wish to have students work with a partner. • Some students may require individual coaching. Give students a similar problem to solve and have them explain how to determine the percent being represented. Or, have them talk through their thinking with a partner. • Use the chalkboard or an overhead to write examples of percents greater than 100% and have students predict the number of grids needed to represent each one. • Use the giant grid developed under Reflect on Your Findings to have concrete and kinesthetic learners demonstrate the actual meaning of 0.7%. It may be beneficial for students to make another large grid of squares divided into eighths to demonstrate the meaning of $\frac{5}{8}$%.
Example 2 Have students do the Show You Know related to Example 2.	• Encourage students to verbalize their thinking. • You may wish to have students work with a partner. • Encourage students to highlight the percents in each statement. • Have students talk through their thinking about how to determine the number of grids needed to represent a percent. • Give students similar problems to solve. Allow them to work with a partner and talk through their thinking.



Show You Know

Represent each percent on a grid.

a) 180% b) 0.6% c) $12\frac{3}{8}\%$

Key Ideas

- To represent a percent, you can shade squares on a grid of 100 squares called a hundred grid. One completely shaded grid represents 100%.

45%

- To represent a percent greater than 100%, shade more than one grid.

170%

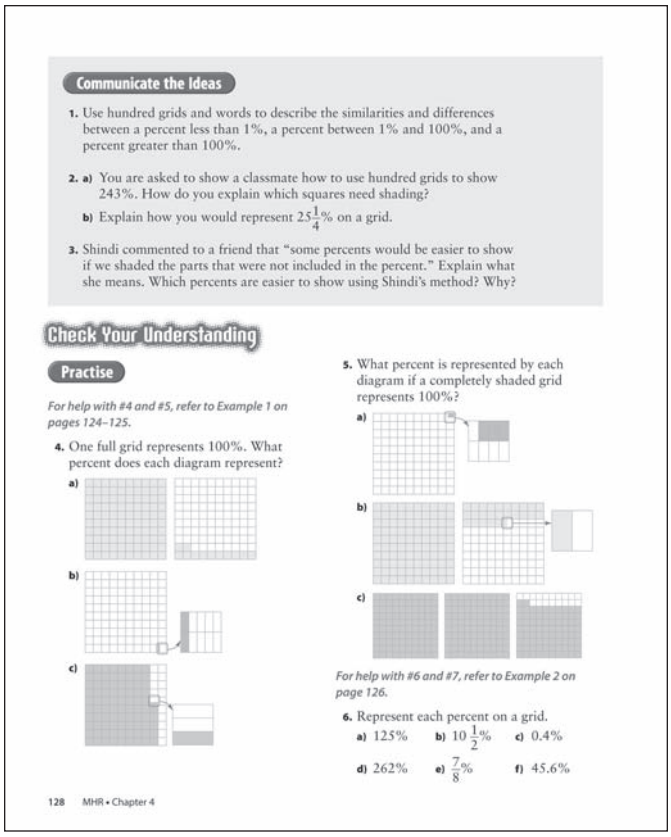
- To represent a fractional percent between 0% and 1%, shade part of one square.

$\frac{1}{3}\%$

- To represent a fractional percent greater than 1%, shade squares from a hundred grid to show the whole number and part of one square from the grid to show the fraction.

$75\frac{1}{3}\%$

4.1 Representing Percents • MHR 127



Communicate the Ideas

1. Use hundred grids and words to describe the similarities and differences between a percent less than 1%, a percent between 1% and 100%, and a percent greater than 100%.

2. a) You are asked to show a classmate how to use hundred grids to show 243%. How do you explain which squares need shading?

b) Explain how you would represent $25\frac{1}{4}\%$ on a grid.

3. Shindi commented to a friend that "some percents would be easier to show if we shaded the parts that were not included in the percent." Explain what she means. Which percents are easier to show using Shindi's method? Why?

Check Your Understanding

Practise

For help with #4 and #5, refer to Example 1 on pages 124–125.

4. One full grid represents 100%. What percent does each diagram represent?

a)

b)

c)

5. What percent is represented by each diagram if a completely shaded grid represents 100%?

a)

b)

c)

For help with #6 and #7, refer to Example 2 on page 126.

6. Represent each percent on a grid.

a) 125% b) $10\frac{1}{2}\%$ c) 0.4%

d) 262% e) $\frac{7}{8}\%$ f) 45.6%

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Key Ideas

The Key Ideas focus on representing percents using hundred grids. Percents greater than 100% require using more than one hundred grid while fractional percents require using an enlargement of one square on a grid. Have students prepare their own summary of the Key Ideas using words and visuals, and record it in their chapter Foldable.

Communicate the Ideas

These questions allow students to apply their understanding of representing percents. Have students work individually to answer the questions. In #3, encourage students to explain their thinking.

Meeting Student Needs

- Students with motor difficulties may find it more manageable to use bingo markers or wide felt markers and large-square grids to represent percents.

ELL

- If several students share a common first language, consider having them discuss the answers to #1 to #3 in their first language. This offers them the opportunity to activate their knowledge using familiar language. Afterward, it may be easier for students to ask for the missing vocabulary to express their thinking in English.
- Allow English language learners to use only hundred grids to communicate their ideas, or use a list of phrases that you provide to help them record their answers.

Common Errors

- Some students may make errors or create unclear representations if they are in a hurry or draw their representations by hand.

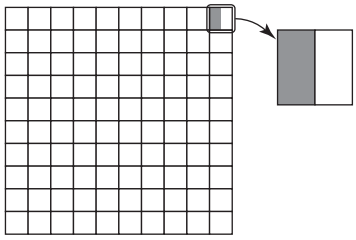
R_x Encourage students to take their time and use **Master 10 Hundred Grids**.

Answers

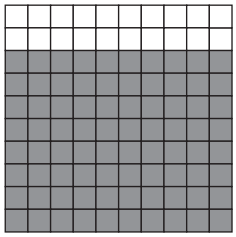
Communicate the Ideas

1. Answers will vary. Example:

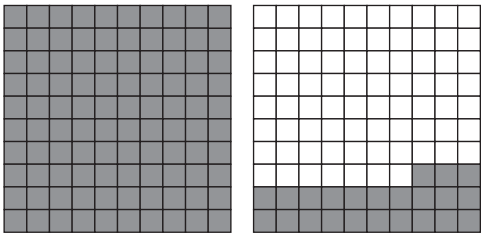
- Percents less than 1% require only a portion of one square to be shaded. The following hundred grid shows $\frac{1}{2}$%.



- Percents between 1% and 100% can be represented on a single hundred grid. The following hundred grid shows 80%.



- Percents greater than 100% require two or more hundred grids. The following hundred grids show 123%.

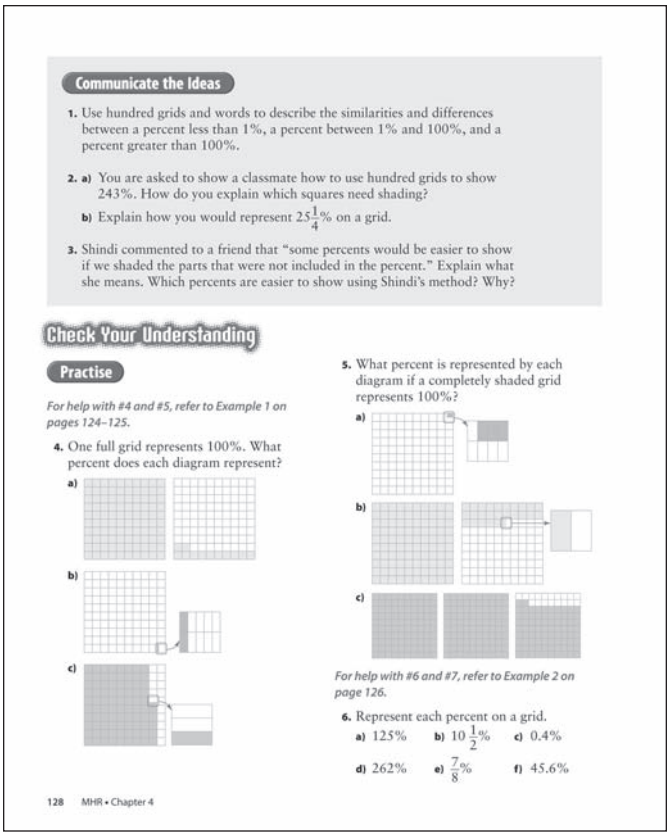


2. a) Completely shade two separate hundred grids. Shade 43 squares on a third hundred grid.

b) Shade 25 squares on a hundred grid, and then shade an additional $\frac{1}{4}$ of one square.

3. Percents that are slightly less than multiples of 100 would be easier to show by not shading the squares that represent the percent. For example, 197% could be shown with two hundred grids where the second grid had only three squares shaded; $200 - 3 = 197$.

Assessment	Supporting Learning
Assessment *as* Learning	
Communicate the Ideas Have all students complete #1 to #3.	• Check each student's answers to #1 and #2. These are key questions; make sure students understand the concepts about representing percents before proceeding. • Encourage students to organize their answer for #1 in a chart. This will help them visualize the similarities and differences. • Consider having students work with a partner to develop a clear explanation for #2. • Encourage students to use the class discussion as a springboard to prepare their own answer. • Have students work with a partner for #3 and think of more than one example. • Use **Master 2 Two Stars and One Wish** to have students critique other students' writing pieces. This master allows students to write two things they like about a piece and one thing they would like to see improved.



Communicate the Ideas

1. Use hundred grids and words to describe the similarities and differences between a percent less than 1%, a percent between 1% and 100%, and a percent greater than 100%.

2. a) You are asked to show a classmate how to use hundred grids to show 243%. How do you explain which squares need shading?
   b) Explain how you would represent $25\frac{1}{4}$% on a grid.

3. Shindi commented to a friend that "some percents would be easier to show if we shaded the parts that were not included in the percent." Explain what she means. Which percents are easier to show using Shindi's method? Why?

Check Your Understanding

Practise

For help with #4 and #5, refer to Example 1 on pages 124–125.

4. One full grid represents 100%. What percent does each diagram represent?
   a)
   b)
   c)

5. What percent is represented by each diagram if a completely shaded grid represents 100%?
   a)
   b)
   c)

For help with #6 and #7, refer to Example 2 on page 126.

6. Represent each percent on a grid.
   a) 125% b) $10\frac{1}{2}$% c) 0.4%
   d) 262% e) $\frac{7}{8}$% f) 45.6%

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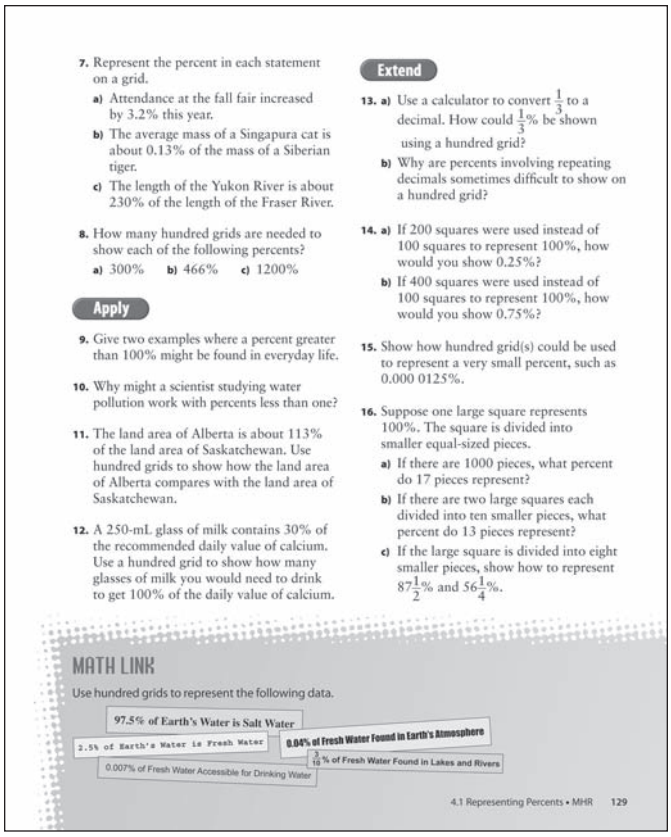


7. Represent the percent in each statement on a grid.
   a) Attendance at the fall fair increased by 3.2% this year.
   b) The average mass of a Singapura cat is about 0.13% of the mass of a Siberian tiger.
   c) The length of the Yukon River is about 230% of the length of the Fraser River.

8. How many hundred grids are needed to show each of the following percents?
   a) 300% b) 466% c) 1200%

Apply

9. Give two examples where a percent greater than 100% might be found in everyday life.

10. Why might a scientist studying water pollution work with percents less than one?

11. The land area of Alberta is about 113% of the land area of Saskatchewan. Use hundred grids to show how the land area of Alberta compares with the land area of Saskatchewan.

12. A 250-mL glass of milk contains 30% of the recommended daily value of calcium. Use a hundred grid to show how many glasses of milk you would need to drink to get 100% of the daily value of calcium.

Extend

13. a) Use a calculator to convert $\frac{1}{3}$ to a decimal. How could $\frac{1}{3}$% be shown using a hundred grid?
   b) Why are percents involving repeating decimals sometimes difficult to show on a hundred grid?

14. a) If 200 squares were used instead of 100 squares to represent 100%, how would you show 0.25%?
   b) If 400 squares were used instead of 100 squares to represent 100%, how would you show 0.75%?

15. Show how hundred grid(s) could be used to represent a very small percent, such as 0.000 0125%.

16. Suppose one large square represents 100%. The square is divided into smaller equal-sized pieces.
   a) If there are 1000 pieces, what percent do 17 pieces represent?
   b) If there are two large squares each divided into ten smaller pieces, what percent do 13 pieces represent?
   c) If the large square is divided into eight smaller pieces, show how to represent $87\frac{1}{2}$% and $56\frac{1}{4}$%.

MATH LINK

Use hundred grids to represent the following data.

97.5% of Earth's Water is Salt Water
2.5% of Earth's Water is Fresh Water
0.04% of Fresh Water Found in Earth's Atmosphere
$\frac{3}{4}$% of Fresh Water Found in Lakes and Rivers
0.007% of Fresh Water Accessible for Drinking Water

4.1 Representing Percents • MHR 129

Check Your Understanding

Practise

Students could be given a choice between #4 and #5. Provide students with **Master 10 Hundred Grids**. As students work, circulate and provide coaching to those who need it.

Apply

For #9 and #10, have a class discussion about other real-life examples of percents over 100% and less than 1%. For each example, ask students to explain why percents were used, and whether the information could be presented more clearly in any other ways.

Extend

These questions are designed to refine students' understanding about representing percents such as repeating decimal percents. Encourage students to create their own variations of representing less typical percents.

Math Link

The Math Link provides students with an opportunity to apply their understanding of representing percents on grids. Students need to complete this Math Link in order to do the Wrap It Up! at the end of the chapter. Encourage students to think of ways to represent very small percents in order to highlight the scarcity of drinking water compared to Earth's total water supply. For example, someone might create a poster showing 100 water bottles and shade the available drinking water in a bright colour as a percent of the total water supply. Consider having students share their representations with the class and identify the percents.

Meeting Student Needs

- Coach students who need help to represent percents less than 1% by using a hundred grid to represent an enlarged square of one unit or 1%. Allow students to shade the appropriate number of units to show their understanding.
- Provide **BLM 4–5 Section 4.1 Extra Practice** to students who would benefit from more practice.
- For #10, examples that involve parts per million (ppm) related to water pollution may be difficult for some students to understand. Explain that scientists are able to detect very low concentrations of substances in water, air, or soil. These very low concentrations are referred to as *parts per million* (ppm). Help students visualize how small 1 ppm is by using some of the following analogies: 1 s in 280 h, 1 cm in 10 km, or 5 mL of water in a bathtub filled with water.

ELL

- Consider reducing the number of word problems that English language learners need to answer.
- In #7, English language learners may have difficulty with terms such as *mass* and *length*. Use a visual to help explain the meaning of these terms.

Gifted and Enrichment

- Challenge students to give some other examples of percents less than 1%.

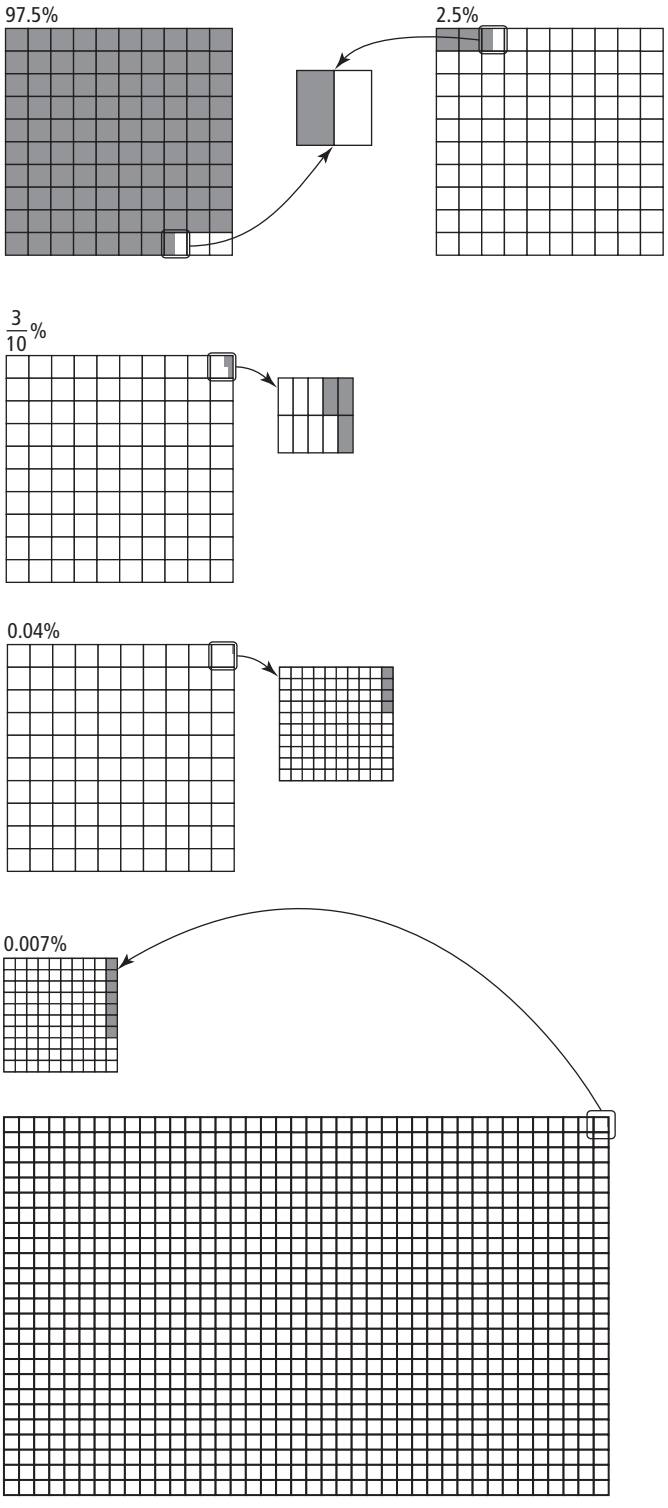
Common Errors

- Some students may confuse 0.10% with 10%.

R$_x$ Use zooming in to show the difference between 0.10% and 10%.

Answers

Math Link



Assessment	Supporting Learning
Assessment *for* Learning	
Practise Have students do #4, #6, and #8. Students who have no problems with these questions can go on to the Apply questions.	• Allow students to answer the questions using any combination of oral and written answers. • Encourage students to refer to the examples to help them. • Provide additional coaching with Example 1 to students who need help with #4. Coach students through corrections to their answers, and then have them complete #5 on their own. • Provide additional coaching with Example 2 to students who need help with #6. Coach students through corrections to their answers, and then have them complete #7 on their own. • For #4, #6, and #8, some students may benefit from using base ten blocks to lay out percents greater than 100%. • For #8, consider providing students with **Master 10 Hundred Grids** to help answer the question.
Math Link The Math Link on page 129 is intended to help students work toward the chapter problem wrap-up titled Wrap It Up! on page 153.	• Allow students to use a hundred grid to represent a zoomed-in square for shading percents less than 1%. • Students who need help getting started could use **BLM 4–6 Section 4.1 Math Link**, which provides scaffolding.
Assessment *as* Learning	
Math Learning Log Have students answer the following question: • How are percents greater than 100% and percents less than 1% similar in the way that they are represented? How are they different?	• Allow students to cut and paste shaded hundred grids (or portions thereof) onto drawing paper. Encourage creative students to make mosaic representations of percents. They could then use any combination of oral and written work to note the similarities and differences. Consider posting samples of different percents in the classroom. • Encourage students to use the What I Need to Work On tab of their chapter Foldable to note what they continue to have difficulties with.