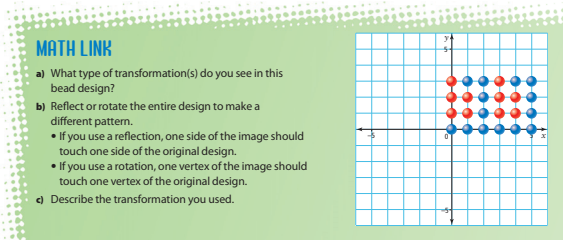
A Tour of Your Textbook

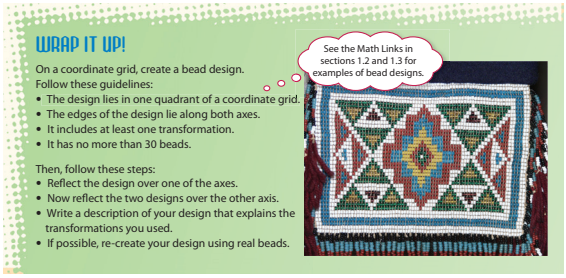
How is *MathLinks 7* set up?

Each chapter starts off with a Chapter Problem called a **Math Link** that connects math and your world. You will be able to solve the problem using the math skills that you learn in the chapter.

You are asked to answer questions related to the problem throughout the chapter. These questions appear in **Math Link** boxes.



The **Wrap It Up!** is at the end of the chapter, on the second Practice Test page.

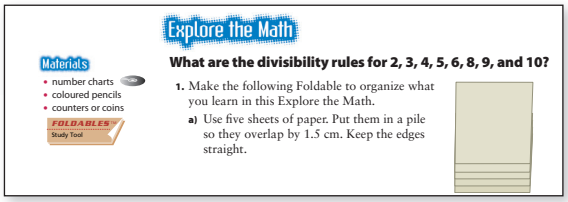


The numbered sections often start with a visual to connect the topic to a real setting. The purpose of this introduction is to help you make connections between the math in the section and the real world, or to make connections to what you already know.

A three-part lesson follows.

The first part helps you find answers to the key question.

- An activity is designed to help you build your own understanding of the new concept and lead toward answers to the key question.



Explore the Math

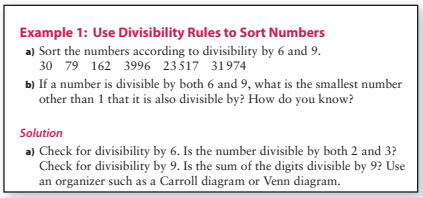
What are the divisibility rules for 2, 3, 4, 5, 6, 8, 9, and 10?

Materials
- number charts
- coloured pencils
- counters or coins

FOLDABLES Study Tool

1. Make the following Foldable to organize what you learn in this Explore the Math.
   a) Use five sheets of paper. Put them in a pile so they overlap by 1.5 cm. Keep the edges straight.

- **Examples** and **Solutions** demonstrate how to use the concept.



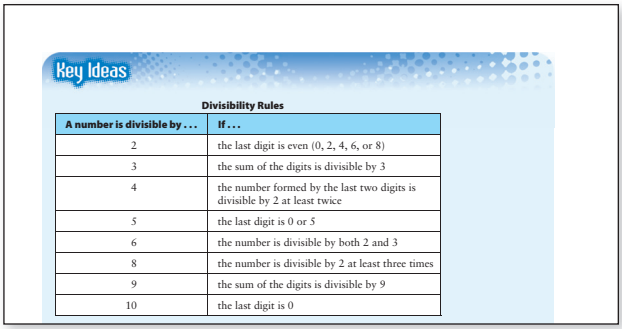
Example 1: Use Divisibility Rules to Sort Numbers

a) Sort the numbers according to divisibility by 6 and 9.
30 79 162 3996 23 517 31 974

b) If a number is divisible by both 6 and 9, what is the smallest number other than 1 that it is also divisible by? How do you know?

Solution

a) Check for divisibility by 6. Is the number divisible by both 2 and 3? Check for divisibility by 9. Is the sum of the digits divisible by 9? Use an organizer such as a Carroll diagram or Venn diagram.

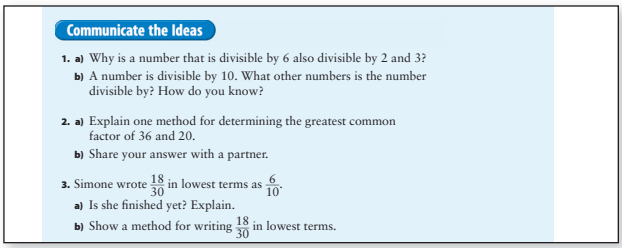


Key Ideas

Divisibility Rules

A number is divisible by . . .	If . . .
2	the last digit is even (0, 2, 4, 6, or 8)
3	the sum of the digits is divisible by 3
4	the number formed by the last two digits is divisible by 2 at least twice
5	the last digit is 0 or 5
6	the number is divisible by both 2 and 3
8	the number is divisible by 2 at least three times
9	the sum of the digits is divisible by 9
10	the last digit is 0

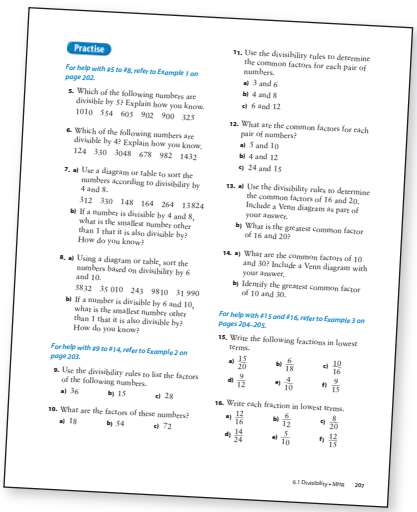
- A summary of the main new concepts is given in the **Key Ideas** box.



Communicate the Ideas

1. a) Why is a number that is divisible by 6 also divisible by 2 and 3?
   b) A number is divisible by 10. What other numbers is the number divisible by? How do you know?
2. a) Explain one method for determining the greatest common factor of 36 and 20.
   b) Share your answer with a partner.
3. Simone wrote $\frac{18}{30}$ in lowest terms as $\frac{6}{10}$.
   a) Is she finished yet? Explain.
   b) Show a method for writing $\frac{18}{30}$ in lowest terms.

- Questions in the **Communicate the Ideas** section let you talk or write about the concepts and assess whether you understand the ideas.



Practise

For help with #5 to #8, refer to Example 1 on page 202.

5. Which of the following numbers are divisible by 5? Explain how you know.
1010 554 605 902 900 325

6. Which of the following numbers are divisible by 4? Explain how you know.
124 330 3048 678 982 1432

7. a) Use a diagram or table to sort the numbers according to divisibility by 4 and 8.
312 330 148 164 264 13 824
b) If a number is divisible by 4 and 8, what is the smallest number other than 1 that it is also divisible by? How do you know?

8. a) Using a diagram or table, sort the numbers based on divisibility by 6 and 10.
5832 35 010 243 9810 31 990
b) If a number is divisible by 6 and 10, what is the smallest number other than 1 that it is also divisible by? How do you know?

For help with #9 to #14, refer to Example 2 on page 203.

9. Use the divisibility rules to list the factors of the following numbers.
a) 36 b) 15 c) 28

10. What are the factors of these numbers?
a) 18 b) 54 c) 72

11. Use the divisibility rules to determine the common factors for each pair of numbers.
a) 3 and 6
b) 4 and 8
c) 6 and 12

12. What are the common factors for each pair of numbers?
a) 5 and 10
b) 4 and 12
c) 24 and 15

13. a) Use the divisibility rules to determine the common factors of 16 and 20. Include a Venn diagram as part of your answer.
b) What is the greatest common factor of 16 and 20?

14. a) What are the common factors of 10 and 30? Include a Venn diagram with your answer.
b) Identify the greatest common factor of 10 and 30.

For help with #15 and #16, refer to Example 3 on Pages 204–205.

15. Write the following fractions in lowest terms.
a) $\frac{15}{20}$ b) $\frac{6}{18}$ c) $\frac{10}{16}$
d) $\frac{9}{12}$ e) $\frac{4}{10}$ f) $\frac{9}{15}$

16. Write each fraction in lowest terms.
a) $\frac{12}{16}$ b) $\frac{6}{12}$ c) $\frac{8}{20}$
d) $\frac{14}{24}$ e) $\frac{5}{10}$ f) $\frac{12}{15}$

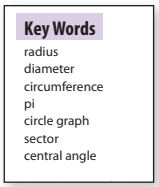
6.1 Divisibility • MHR 207

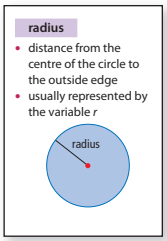
- **Practise:** These are questions to check your knowledge and understanding of what you have learned.
- **Apply:** In these questions, you need to apply what you have learned to solve problems.
- **Extend:** These questions may be more challenging and may make connections to other lessons.

How does *MathLinks 7* help you learn?

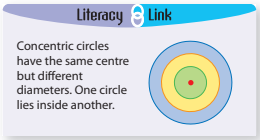
Understanding Vocabulary

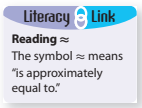
Key Words are listed on the Chapter Opener. Perhaps you already know the meaning of some of them. Great! If not, watch for these terms highlighted the first time they are used in the chapter. The meaning is given close by in the margin.





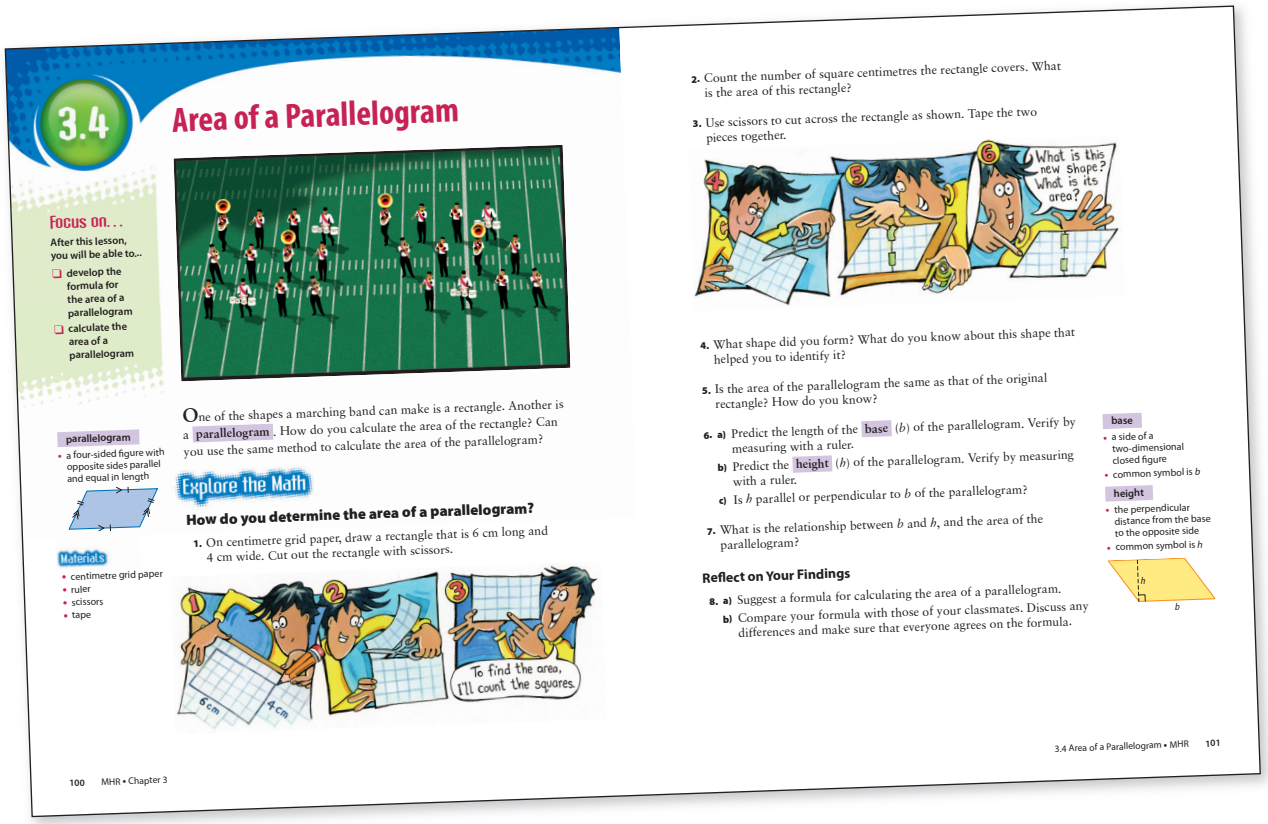
Literacy Links provide tips to help you read and interpret items in math. These tips will help you in other subjects as well.

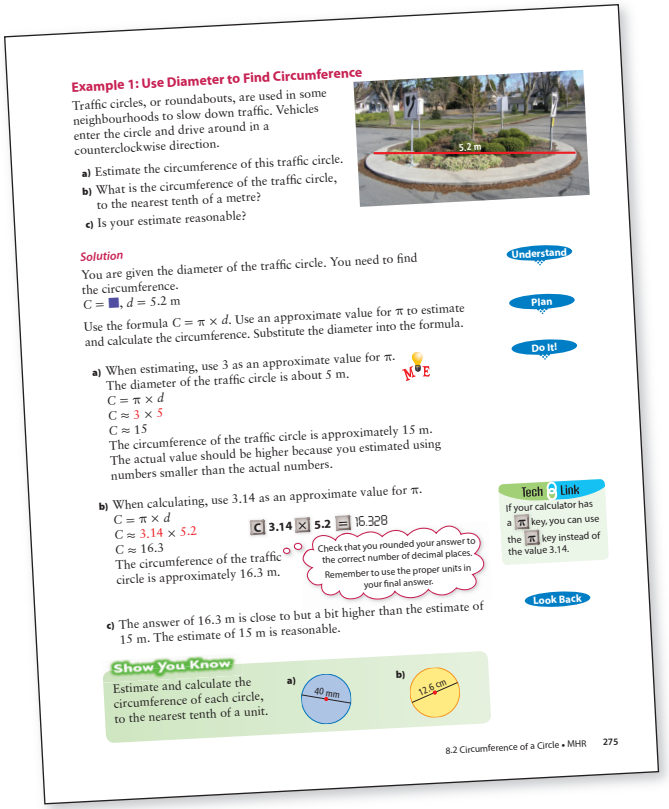




Understanding Concepts

The **Explore the Math** and **Discuss the Math** activities are designed to help you construct your own understanding of new concepts. The key question tells you what the activity is about. Short steps, with illustrations, lead you to make some conclusions in the **Reflect on Your Findings** question.





Example 1: Use Diameter to Find Circumference

Traffic circles, or roundabouts, are used in some neighbourhoods to slow down traffic. Vehicles enter the circle and drive around in a counterclockwise direction.

a) Estimate the circumference of this traffic circle.
b) What is the circumference of the traffic circle, to the nearest tenth of a metre?
c) Is your estimate reasonable?

5.2 m

Solution

Understand

You are given the diameter of the traffic circle. You need to find the circumference.
$C = \blacksquare$, $d = 5.2$ m

Plan

Use the formula $C = \pi \times d$. Use an approximate value for π to estimate and calculate the circumference. Substitute the diameter into the formula.

Do It!

a) When estimating, use 3 as an approximate value for π.
The diameter of the traffic circle is about 5 m.
$C = \pi \times d$
$C \approx 3 \times 5$
$C \approx 15$
The circumference of the traffic circle is approximately 15 m.
The actual value should be higher because you estimated using numbers smaller than the actual numbers.

b) When calculating, use 3.14 as an approximate value for π.
$C = \pi \times d$
$C \approx 3.14 \times 5.2$
$C \approx 16.3$
The circumference of the traffic circle is approximately 16.3 m.

C 3.14 × 5.2 = 16.328

Check that you rounded your answer to the correct number of decimal places.
Remember to use the proper units in your final answer.

Tech Link
If your calculator has a π key, you can use the π key instead of the value 3.14.

Look Back

c) The answer of 16.3 m is close to but a bit higher than the estimate of 15 m. The estimate of 15 m is reasonable.

Show You Know

Estimate and calculate the circumference of each circle, to the nearest tenth of a unit.

a) 40 mm

b) 12.6 cm

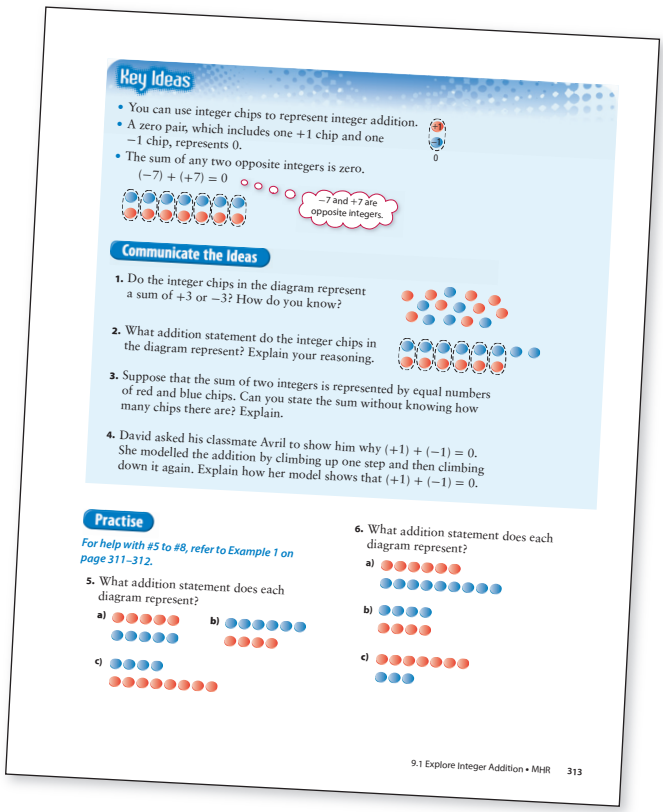
8.2 Circumference of a Circle • MHR 275

The **Examples** and their worked **Solutions** include several tools to help you understand the work.

- Notes in a thought bubble help you think through the steps.
- Sometimes different methods of solving the same problem are shown. One way may make more sense to you than the other.
- **Problem Solving Strategies** are pointed out.
- Calculator key press sequences are shown where appropriate.
- Many Examples are followed by a **Show You Know**. These questions help you check that you understand the skill covered in the Example.

The exercises begin with **Communicate the Ideas**. These questions focus your thinking on the **Key Ideas** you learned in the section. By discussing these questions in a group, or doing the action called for, you can see whether you understand the main points and are ready to start the exercises.

The first few questions in the **Practise** can often be done by following one of the worked Examples.



Key Ideas

- You can use integer chips to represent integer addition.
- A zero pair, which includes one +1 chip and one −1 chip, represents 0.
- The sum of any two opposite integers is zero.
  $(-7) + (+7) = 0$

0

−7 and +7 are opposite integers.

Communicate the Ideas

1. Do the integer chips in the diagram represent a sum of +3 or −3? How do you know?
2. What addition statement do the integer chips in the diagram represent? Explain your reasoning.
3. Suppose that the sum of two integers is represented by equal numbers of red and blue chips. Can you state the sum without knowing how many chips there are? Explain.
4. David asked his classmate Avril to show him why $(+1) + (-1) = 0$. She modelled the addition by climbing up one step and then climbing down it again. Explain how her model shows that $(+1) + (-1) = 0$.

Practise

For help with #5 to #8, refer to Example 1 on page 311–312.

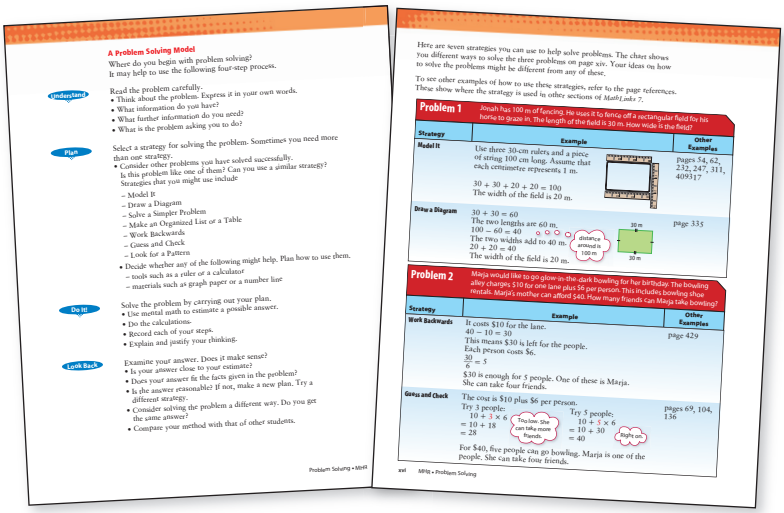
5. What addition statement does each diagram represent?
   a)
   b)
   c)
6. What addition statement does each diagram represent?
   a)
   b)
   c)

9.1 Explore Integer Addition • MHR 313

What else will you find in *MathLinks 7*?

Problem Solving

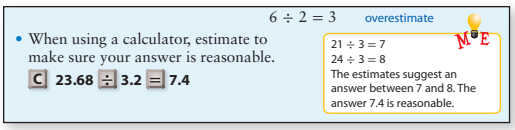
At the beginning of the student resource there is an overview of the four steps you can use to approach **Problem Solving**. Samples of 7 problem solving strategies are shown. You can refer back to this section if you need help choosing a strategy to solve a problem. You are also encouraged to use your own strategies.



Mental Math and Estimation

This **Mental Math and Estimation** logo does one of two things:

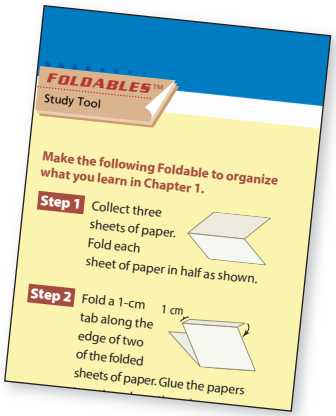
1. It signals where you can use mental math and estimation.
2. It provides useful tips for using mental math and estimation.



Foldables™

FOLDABLES™ Study Tool

Each chapter opener describes how to make a **Foldable** to help organize what you learn in the chapter. The last part of each Foldable encourages you to keep track of what you need to work on.



Other Features

Did You Know?

The colours of the Olympic rings were chosen because at least one of these colours is found in the flag of every nation. The five interlocking rings represent the union of the five major regions of the world—the Americas, Africa, Asia, Oceania, and Europe.

Did You Know?

These are interesting facts related to math topics you are learning.

Geography Link

The rainfall recorded for Terrace, BC is correct. You may wish to learn more about the geography of Terrace that makes it such a wet place.

Subject Links

This feature links the current topic to another subject area.

WWW Web Link

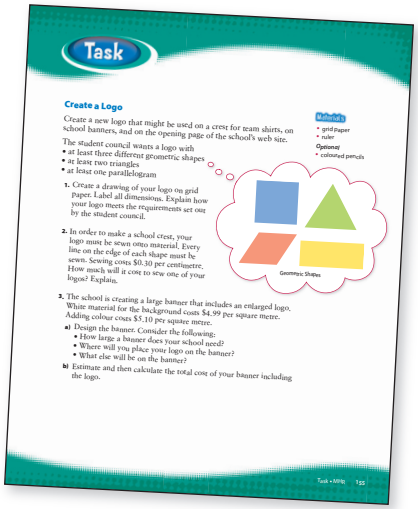
To learn more about pi, go to www.mathlinks7.ca and follow the links.

Web Links

You can find extra information related to some questions on the Internet. Log on to **www.mathlinks7.ca** and you will be able to link to recommended Web sites.

Chapter Review and *Practice Test*

There is a **Chapter Review** and a **Practice Test** at the end of each chapter. The chapter review is organized by section number so you can look back if you need help with a question. The test includes the different types of questions that you will find on provincial tests: multiple choice, numerical response, short answer, and extended response.



Cumulative Review

To help you reinforce what you have learned, there is a review of the previous four chapters at the end of Chapters 4, 8, and 12. Each of these special reviews is followed by a Task.

Task

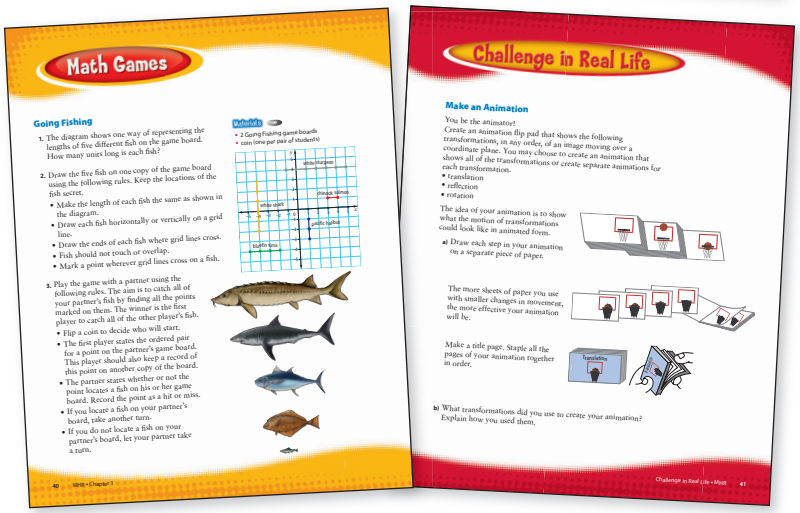
These tasks require you to use skills from more than one chapter. You will also need to use your creativity.

Math Games and *Challenge in Real Life*

The last two pages of each chapter provide **Math Games** and a **Challenge in Real Life**.

Math Games provide an interesting way to practise the skills you learned during the chapter. Most games can be played with a partner. Some can be played with a larger group. Enjoy them with your friends and family.

The **Challenge in Real Life** provides an interesting problem that shows how the math you learned in the chapter relates to jobs, careers, or daily life.



Answers

Answers are provided for all Practise, Apply, and Extend questions, as well as Reviews. Sample answers are given for questions that have a variety of possible answers or that involve communication. If you need help, read the sample and then try to give an alternative response.

Answers are omitted for the Math Link questions and for Practice Tests because teachers may use these questions to assess your progress.

Glossary

Refer to the illustrated **Glossary** at the back of the student resource if you need to check the exact meaning of mathematical terms.