

# NEW!

Researched and Developed  
Specifically for grades 7-9 Students

From McGraw-Hill Ryerson

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**MATHEMATICS**

MAKING CONNECTIONS

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7



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8



Creating Pathways to Mathematical Success for Intermediate Students



**McGraw-Hill  
Ryerson**

# Development Team

*Resources developed with students and teachers in mind by a team of classroom teachers and consultants, committed to helping all learners develop a strong foundation for mathematics success*

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## **A Special Thanks To...**

*all the focus group participants, field test teachers, and students across the province, whose tremendous feedback and insight, has supported the development of an engaging and exciting new mathematics program.*

# Lesson Design

McGraw-Hill Ryerson's new mathematics program is designed to activate students' learning through a balanced approach to mathematics instruction.



- + Consistent lesson design modelled on John Van de Walle's **three-part lesson model**
- + A sound method of presenting mathematical concepts
- + Ease of navigation for students, parents, and teachers alike

## 1. Discover the Math

**Discover the Math** is the math lesson. The introduction preceding it is designed to engage students by making connections between the mathematics in the section and students' personal experience of the real world.

**Discover the Math** can consist of the following lesson types.

- Concrete Explorations
- Semi-concrete Explorations
- Direct Instruction

The image displays two pages from a mathematics textbook. The left page, titled "11.2 Explore Integer Addition", features a "Discover the Math" section with a photograph of two students working with integer chips. The right page shows a "Worked Example" for integer addition with a solution using integer chips and a number line.

Examples with solutions follow the investigation to provide some models of how the math is applied to real problems.

## 2. Key Ideas

**Key Ideas** summarizes the key concepts of the lesson for students, using both text and visuals.

**Communicate the Ideas**, a subsection of **Key Ideas**, provides some communication-based questions to encourage students to communicate their understanding of the lesson material in the **Discover the Math**.

## 3. Check your Understanding

**Check Your Understanding** consists of exercise sets, which include Practise, Apply, and Extend. These sets include exercises for all performance levels and cover all four categories of the achievement chart.

The image shows two pages from a math textbook. The left page is titled "Example 2: Modelling Issues" and contains a "Discover the Math" section with several questions. The right page contains "Apply" and "Extend" sections with various math problems and a "Making Connections" box.

The **Lesson Design** of McGraw-Hill Ryerson's new program supports the lesson structure of **TIPS\***

TIPS' MATCH Lesson Design	McGraw-Hill Ryerson: Making Connections
Minds On	Chapter Opener, Section Opener discussion,
	Discover the Math focus questions
AcTion	Discover the Math investigations
Consolidate	Key Ideas and Communicate the Ideas
	Reflect Questions
Home Activity or Further Classroom Consolidation	Check Your Understanding, Chapter Problems,
	Making Connections feature boxes
For more detail refer to TIPS Section 6: Administrator's Package. Pages 6 & 13	

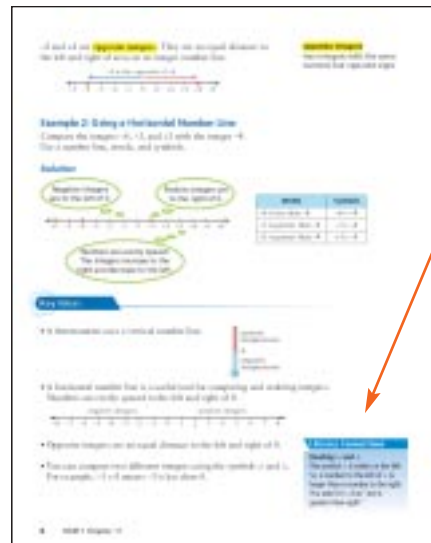
\* Both the **Targeted Implementation and Planning Support document (TIPS)** and McGraw-Hill Ryerson's new math program focused solely on the Intermediate Learner.

# Pathways to Success

*“Learning styles is the way in which a learner begins to concentrate on, process, and retain new and difficult information.” (Dunn & Dunn, 1993)*



Excellent visuals and multiple representations of concepts and instructions support **visual learners**, **ESL students**, and **struggling readers**.



**Literacy Connections** boxes and key terms bolded, highlighted, and defined in the margin support **struggling readers** and promotes mathematics literacy for all learners.

**McGraw-Hill Ryerson Mathematics: Making Connections** program accommodates the broad range of needs and learning styles—Level 1 through Level 4—including those students requiring accommodations, students with limited proficiency in English, and gifted learners.

“Mathematics can and must be learned by all students.” (NCTM, 2000)

This screenshot shows a section titled "Check Your Understanding" with a "Practice" sub-section. It contains several numbered problems involving integer addition and subtraction, such as "A hiker goes up 12 feet and then down 8 feet. How far is she from the starting point?" and "A bank account starts with \$500. A withdrawal of \$75 is made. How much money is left in the account?"

Worked examples and referenced examples support **all learners**.

This screenshot is titled "11.3 Adding Integers" and features a photograph of a hockey player in a red jersey. The text explains that some players in their careers have both goals and assists, and that a goal is recorded as +1 and an assist as -1. It includes a "Now Work" section with a problem: "How many goals did you score?" followed by a number line and a table for recording data.

Relevant contexts including multi-cultural examples engage students and provide a purpose for the mathematics being learned.

Extend questions, and math games provide additional challenge for **gifted learners**.

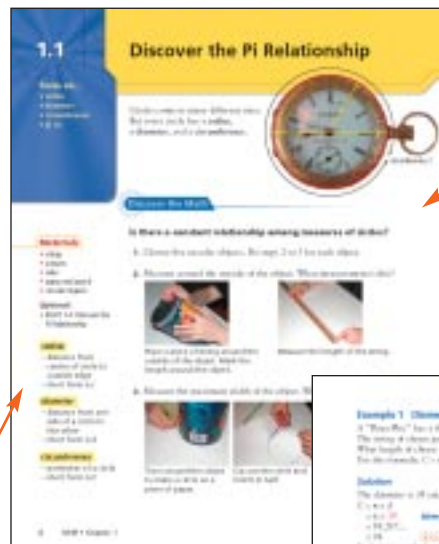
This screenshot is titled "Making Connections" and shows a student using a number line to solve a problem. The text includes a "Materials" list (number line, markers, paper) and a "Procedure" section with steps like "Draw a number line from -10 to 10." and "Place the markers on the number line." It also includes a "Check Your Understanding" section with a problem: "A number line is shown. A point is marked at 3. What number is 5 units to the left of 3?"

**Making Connections** Provides additional opportunities for hands-on and minds-on learning—balance between concrete and semi-concrete learning opportunities

*The Teacher's Resource provides support in addressing multiple intelligences and learning styles—additional activities and Blackline Masters, Accommodation suggestions, ESL Support, and teaching strategies. Cross references to **TIPS** are also provided in the Teacher's Resource.*

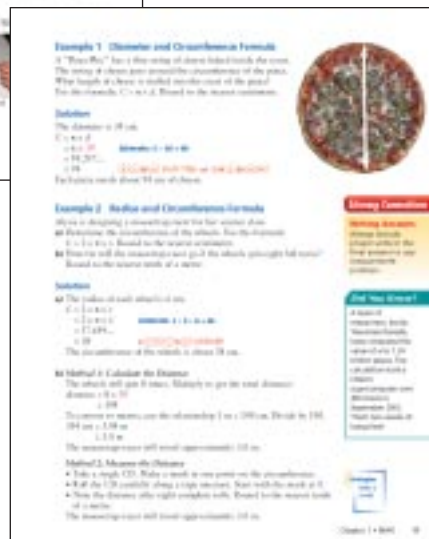
# Numeracy & Literacy

*“Achieving success in literacy is an important priority for students placed at risk. It reduces the gap between high-and low-performing students, while maintaining high standards for all learners.”  
(Ontario Ministry of Education and Training, 2003).*



**Visuals** accompany each step of written instructions.

**Key Words** are listed at the beginning of the chapter, bolded, and highlighted when first used in the text, and defined in the margins.



Emphasis is placed on meaningful **real world context** and **applications** so students can see the purpose of the math.

**Literacy Connections** boxes provide students with practical strategies that will support their use of the text inside as well as outside the math classroom.



**McGraw-Hill Ryerson Mathematics: Making Connections** program supports the development of life-long Numeracy and Literacy skills in the Intermediate classroom.

**Key Ideas**

- The area of a circle is  $\pi r^2$ .
- The area of a sector of a circle is  $\frac{\theta}{360} \pi r^2$ .
- The area of a segment of a circle is the area of the sector minus the area of the triangle formed by the radii and the chord.

**Communicating the Ideas**

- What kind of units are used to measure area? Write an area unit.
- Find the area of a circle with a radius of 5 cm.
- What value should you get if you double the area of one circle to the square of its radius? Explain.

**Practice**

1. Find the area of each circle. Round to the nearest square centimeter.

2. A circle has a radius of 4 cm. What is the area of the circle? Round to the nearest square centimeter.

3. A circle has a circumference of 10 cm. What is the area of the circle? Round to the nearest square centimeter.

**Did You Know?**

The area of a circle is the same as the area of a square with side length  $r\sqrt{\pi}$ .

**Key Ideas** offers lesson summaries in text and visual form. **Communicate the Ideas**, and **Apply in Check Your Understanding** provide students with opportunities to write in their journals or to communicate their ideas orally.

**Did You Know** and **Making Connections** boxes emphasize cross-curricular connections.

A **balanced assessment design** is heightened with **cross-strand assessment** opportunities and coverage of both conceptual understanding and procedural skill.

Each **Practice Test** format mirrors **Grade 9 EQAO Numeracy Test** format (Multiple Choice, Short Answer, Extended Response).

**Chapter Problem Wrap-Up** provides a summative assessment task

**11 Practice Test**

**Multiple Choice**

- Which expression represents  $(-3) + (-4)$ ?
  - A.  $-7$
  - B.  $-1$
  - C.  $1$
  - D.  $7$
- The number 10 is written in standard form as  $10^1$ . Which of the following is written in standard form?
  - A.  $10^2$
  - B.  $10^3$
  - C.  $10^4$
  - D.  $10^5$
- The number 10 is written in standard form as  $10^1$ . Which of the following is written in standard form?
  - A.  $10^2$
  - B.  $10^3$
  - C.  $10^4$
  - D.  $10^5$

**Short Answer**

- Evaluate the expression  $3x + 2y$  when  $x = 4$  and  $y = 5$ .

**Chapter Problem Wrap-Up**

Suppose the temperature in degrees Celsius is  $T$  and the temperature in degrees Fahrenheit is  $F$ . The relationship between  $T$  and  $F$  is given by the equation  $F = \frac{9}{5}T + 32$ .

What pattern do you see in the table? Describe the relationship between  $T$  and  $F$ .

Temperature (°C)	Temperature (°F)
-20	-4
-10	14
0	32
10	50
20	68
30	86
40	104
50	122
60	140
70	158
80	176
90	194
100	212



The Teacher's Resource provides ESL and Accommodation suggestions.



# Problem Solving

“Problem solving is not only a goal of mathematics, but also a major means of doing so.”  
(TIPS Section 1, Developing Mathematical Literacy)

Recognize that mathematical problems sometimes present and do not give. There are many different ways to solve problems, so sometimes finding connections and an organization to different methods and to use your own ideas, may reflect on the different way you work.

**Understand**

- How do you begin with problem solving? We suggest the following four-step process.
  - 1 Think about the problem. Figure out what you know.
  - 2 What information do you need?
  - 3 What further information do you need?
  - 4 What is the problem asking you to do?

**Plan**

Select a strategy for solving the problem. Sometimes you will use more than one strategy.

- Consider other problems you have solved successfully in this problem. Use one of these! Exercises a similar strategy! Strategies that you might use include:
  - Make a model
  - Make an example
  - Find a pattern or diagram
  - Find a mathematical connection
  - Choose a formula
  - Solve a simpler problem
  - Consider other uses of the problem:
    - make a table or a grid
    - make a tree or graph paper

**Execute**

- Solve the problem for yourself and for others.
- Be sure you can explain to others how you did it.
- Explain and justify your thinking.



**Reflect**

- Evaluate your answer. Does it make sense?
- Do you have another way to solve the problem?
- Can you connect to the facts you know?
- Can you connect to other problems you have solved?
- Consider solving the problem a different way.
- Compare your method with others.



**Problem Solving Strategies**

There are twelve strategies you can use to help solve problems. The chart shows one different way to solve the first problem on page 13. You take it home to solve the problems using the different ways on your own.

To see other examples of how to use these strategies, look to the page references. These show whether the strategy is used in other sections of *Mathematics 7* using connections.

Problem 1	Strategy	Where else this is used
<b>Problem 1</b> You have 100 dollars and you want to buy 100 pens. Consider each connection represents 1 pen. $10 \times 10 = 100 = 10 \times 10$ The width of the field is 10 m.		
<b>Make a picture or diagram</b> $10 \times 10 = 100$ The area length is 10 m. $100 \div 10 = 10$ The width is 10 m.		
<b>Write an equation</b> The formula for the perimeter of a rectangle is: $P = 2l + 2w$ Substitute $P = 100$ , $l = 10$ $100 = 2l + 2w$ $100 = 2l + 2(10)$ $100 = 2l + 20$ The width of the field is 40 m.		

**Problem 2**  
How much can you get for your money? How much money do you have? How much money do you need? How much money do you have?

Strategy	Strategy	Where else this is used
<b>Use a model</b>		
<b>Use a diagram</b>		
<b>Use a table</b>		
<b>Use a graph</b>		

Methods and strategies for problem solving are described and modelled at the beginning of the student text and then referenced throughout



A variety of problem solving opportunities are provided for students.

Each chapter begins with an investigation of a real-life problem.

At the end of every two chapters, students are presented with a **Task**. These cross-strand tasks require students to apply what they have learned in the two previous chapters to solve real life broad-based problems.

The last question in the **Apply** section of **Check Your Understanding** is a **Try This!** question that allows multiple entry points.

In the **Extend** section of **Check Your Understanding** and in the **Extended Response** section at the end of every chapter there are problems for students to solve that challenge higher levels of thinking and extend thinking beyond the curriculum.

Icons are also used to validate student thinking.



Icons are placed throughout text to encourage students to use different strategies.



*Problem solving is integral to all mathematics; students need to engage in problem exercises to learn concepts and procedures for understanding. McGraw-Hill Ryerson has made the problem-based learning approach the focus of its program.*

# Home Connections

The home activities of the McGraw-Hill Ryerson program serve several purposes: to support learning and to inform parents of the program, its goals, and their child's progress.

## Student Text

Clear summaries of the key concepts appear in the **Key Ideas** throughout the student text.

**Worked examples** have **page references** for further support.

The image displays two pages of student text. The left page features 'Example 2: Modelling Rates' with a table of data and a 'Key Idea' section. The right page features 'Apply' problems and a 'Review' section. Red arrows point from the text on the left to specific elements in the student text images.

**Key Words** and **Glossary** explain terms.

The **Making Connections** boxes and the **Workbook** feature opportunities for students to take math home.

## Support Material

**Letters to the Parent** are provided in the Teacher's Resource for the parent/guardian; they describe the curriculum and lessons so parents understand the objectives and content of each chapter.

**Rubrics** and **Student Exemplars** for each of the four 4 levels are provided.

## Student Workbook

**Website** with Student and Parent Centres includes at-home activities, student self-assessment, fun weblinks, and much more!



A variety of home connections materials are provided in the **McGraw-Hill Ryerson Mathematics: Making Connections** program.

# Combined Grade Solutions

*McGraw-Hill Ryerson recognizes that many schools and teachers face the challenges of combined grades. Key consideration has been given to combined grades in the development and design of the **McGraw-Hill Ryerson Mathematics: Making Connections** program.*

	<b>McGraw-Hill Ryerson MATHEMATICS 7: Making Connections</b>	<b>McGraw-Hill Ryerson MATHEMATICS 8: Making Connections</b>
	Get Ready for Grade 7	Get Ready for Grade 8
Chapter 1	Measurement and Number Sense	Measurement and Number Sense
Chapter 2	Two-Dimensional Geometry, With Patterning	Two-Dimensional Geometry
Chapter 3	Number Sense: Fraction Operations	Number Sense: Fraction Operations
Chapter 4	Probability	Probability
Chapter 5	Number Sense: Fractions, Decimals, and Percents	Number Sense: Rates, Ratios, and Percents
Chapter 6	Patterning	Patterning and Algebra
Chapter 7	Exponents	Exponents
Chapter 8	Three-Dimensional Geometry and Measurement	Three-Dimensional Geometry and Measurement
Chapter 9	Collect and Organize Data	Organize and Display Data
Chapter 10	Analyze and Interpret Data	Analyze and Interpret Data
Chapter 11	Number Sense: Integers	Integers
Chapter 12	Patterning and Equations	Patterning and Equations
Chapter 13	Geometry of Transformations	Geometry of Angle Properties

## **Student Texts**

*Tables of Contents for grades 7 and 8 have been aligned in terms of sequencing and scope of topics to support ease of use in a combined grade class.*

## **Teacher's Resource**

*The Teacher's Resource provides strategies for teaching, planning, and managing combined grades.*

# Assessment & Evaluation

*Assessment in McGraw-Hill Ryerson Mathematics: Making Connections is designed not only to provide teachers with data regarding student achievement, but also to accommodate the broad range of students' needs.*

**Diagnostic Assessment** materials are provided for teachers to help them identify weaknesses and gaps in student learning and to aid them in programming appropriately.

**Get Ready for Grade 7 and Get Ready for Grade 8** occur prior to the first chapter in each of the textbooks. They review key skills and concepts of the previous grade which students need to be successful with the mathematics of the new grade level.

The **Get Ready** section, at the beginning of each chapter, also reviews concepts and skills that are important prerequisites for students' success in the upcoming chapter.

**Blackline Masters** providing lessons to develop understanding of these topics as well as additional practice are also included in the Teacher's Resource.

Extra practice questions and tests are provided in the **Computerized Assessment Bank**

**Get Ready**

**Identifying Integers**

A debt of \$3 can be represented by the integer -3.  
A temperature of 2°C above freezing can be represented by the integer +2.  
A depth of 4 m below sea level can be represented by the integer -4.

Three integers are shown on the number line.

1. Represent each integer using an integer from the number line.  
 a. A loss of \$5.  
 b. A temperature of 1°C below freezing.  
 c. A gain of 2 ft.

2. What integer is represented by each point on the number line?

3. Describe how the positions of the integers on the number line are related to 0.  
 a.  $+1$  and  $-1$   
 b.  $-1$  and  $+1$

**Comparing and Ordering Numbers**

Order the numbers. The circle shows the number of soccer balls in each store.

Store	Number of Soccer Balls
Store A	10
Store B	15
Store C	20
Store D	25
Store E	30

1. Order the numbers on each number line.

a.  $10, 15, 20, 25, 30$   
 b.  $30, 25, 20, 15, 10$

2. Write the numbers from least to greatest on a number line.

a.  $10, 15, 20, 25, 30$   
 b.  $30, 25, 20, 15, 10$

**Finding the Mean of a Set of Data**

The number line below has seven boxes of different sizes and weights.

What is the mean number of boxes?

1. Calculate the mean of each set of data.  
 a. 10, 15, 20, 25, 30  
 b. 10, 15, 20, 25, 30, 35  
 c. 10, 15, 20, 25, 30, 35, 40

2. Calculate the mean of each set of data.  
 a. 10, 15, 20, 25, 30, 35, 40  
 b. 10, 15, 20, 25, 30, 35, 40, 45  
 c. 10, 15, 20, 25, 30, 35, 40, 45, 50

**Finding the Median of a Set of Data**

The price of a stock today for seven days is recorded below.

What is the median price?

1. Find the median of each set of data.  
 a. 10, 15, 20, 25, 30  
 b. 10, 15, 20, 25, 30, 35  
 c. 10, 15, 20, 25, 30, 35, 40

2. Find the median of each set of data.  
 a. 10, 15, 20, 25, 30, 35, 40  
 b. 10, 15, 20, 25, 30, 35, 40, 45  
 c. 10, 15, 20, 25, 30, 35, 40, 45, 50



*A variety of assessment strategies and tools are employed to accommodate the diversity of abilities and learning styles of students.*

**Formative Assessment** resources provide ongoing assessment as to how students are doing and how they might improve.

**Reflect** questions in the Discover the Math section provide teachers with information about students understanding of the concepts under investigation.

**Communicate the Ideas** also informs teachers how well students understand and can formulate the central concept or “big idea.”

Questions in **Check Your Understanding** are of a formative nature giving teachers with information about students’ levels of knowledge.

Journal opportunities are provided in the Teacher’s Resource

**Example 7: Combining Profit and Loss**

Each year a bookstore spends a fixed amount for the first few weeks, to restock books and run on a schedule.

- In year 1, it costs \$100,000 and the store makes \$150,000.
- In year 2, it costs \$120,000 and the store makes \$180,000.

The bookstore owner is interested in the store's overall profit or loss.

**Solution:**

Let  $x$  be the amount spent in year 1.

Let  $y$  be the amount spent in year 2.

The store's overall profit or loss is:

$$(\$150,000 - x) + (\$180,000 - y)$$

**Key Ideas:**

- Calculate each year's profit or loss.
- Add the profits and losses to find the overall profit or loss.

**Communicate the Ideas:**

- Write the algebraic expression for the store's overall profit or loss in year 1.
- Write the algebraic expression for the store's overall profit or loss in year 2.
- Write the algebraic expression for the store's overall profit or loss in year 1 and year 2.
- Write the algebraic expression for the store's overall profit or loss in year 1 and year 2.

**Summative Assessment** tools are designed to assist in making judgements about a student’s achievement and facilitate reporting. Summative assessment is achieved in a variety of ways.

**Practice Test**

**Multiple Choice**

The perimeter of a square is 20 units. What is the area of the square?

- A. 25
- B. 40
- C. 100
- D. 200

The circumference of a circle is 31.4 units. What is the radius of the circle?

- A. 2.5
- B. 5
- C. 10
- D. 20

The circumference of a circle is 31.4 units. What is the diameter of the circle?

- A. 2.5
- B. 5
- C. 10
- D. 20

A rectangular prism has a length of 5 units, a width of 3 units, and a height of 4 units. What is the volume of the prism?

- A. 60
- B. 120
- C. 180
- D. 240

**Word Problem**

A rectangular garden has a length of 10 units and a width of 6 units. The owner wants to increase the length of the garden by 2 units. How much more area will the garden have?

**Extended Response**

M. The radius of a CD is 4 cm. The recording length is 3.5 cm. The recording length is 3.5 cm. The recording length is 3.5 cm. The recording length is 3.5 cm.

**Chapter Problem Wrap-ups**

Design a garden with a perimeter of 20 units. The garden must be a rectangle. The garden must have a length of 6 units. The garden must have a width of 4 units. The garden must have a length of 6 units. The garden must have a width of 4 units.

**Practice Test** at the end of each chapter allow students to identify their strengths and weaknesses.

**Chapter Problem Wrap-ups** reveal whether synthesis of concepts and procedures has occurred. They include answers and four by four rubrics.

**Cross-strand Performance Tasks** (after every second chapter) provide opportunity to show what students have learned in a meaningful way. They include exemplars and four by four rubrics.

# Program Components

*The McGraw-Hill Ryerson Mathematics: Making Connections program provides flexible teaching tools to deliver grade 7 and 8 mathematics efficiently and effectively.*

## Student Text

- + Three-part consistent easy-to-navigate lesson design that considers the needs of all learners, including ESL students
- + Balance of engaging hands-on explorations, guided investigations, and direct instruction
- + Activities designed to facilitate ease of teaching, making use of easy-to-access concrete materials
- + Opportunities for all performance levels to be successful and challenged
- + Support for development of language and literacy skills

## Student Workbook

- + Extra practice for key concepts
- + Extension of text lessons for completion at home
- + Games and fun activities
- + Study skills and self tests
- + Vocabulary and key ideas reviews

## Computerized Assessment Bank

- + Multi-format questions ranging from multiple choice and short answer to extended response
- + Questions at varying levels cover all expectations and achievement chart categories

## Solutions Manual

- + Detailed worked solutions for all text exercises

## Teacher's Resource

- + **FREE** access to our on-line Teacher, Parent, and Student Centres
- + Detailed chapter planning charts
- + Cross references to Targeted Implementation & Planning Support (TIPS)
- + Teaching suggestions for all lessons, including strategies for teaching in a combined grade class
- + Accommodations for ESL, and other learning styles
- + Student exemplars for Chapter Performance Tasks
- + Assessment and Evaluation support
- + Teaching notes highlighting common difficulty areas and common errors
- + Editable Blackline Masters on CD-ROM include: extra practice for all lessons, sample tests, accommodations, self checks, and literacy support and strategies

## Websites

[www.mcgrawhill.ca/books/math7](http://www.mcgrawhill.ca/books/math7)

[www.mcgrawhill.ca/books/math8](http://www.mcgrawhill.ca/books/math8)

- + Additional numeracy support
- + Curriculum correlations
- + Weblinks, interactive activities, and student self-assessment material