4

Linear Equations

Strand
Modelling Linear Relations

Student Text Pages
150–151

Suggested Timing
10–15 min

Related Resources
BLM 4.CO.1 Literacy Link:
   Concept Circle
BLM A11 Presentation Checklist

Key Terms

constant term
formula
opposite operations
standard form
variable form

Additional information and teaching materials for this chapter are available on the McGraw-Hill Ryerson web site at http://mcgrawhill.ca/books/foundations10. You will need your password to access this material.

Chapter Curriculum Specific Expectations
Manipulating and Solving Algebraic Equations
In this chapter, students will
ML1.01 solve first-degree equations involving one variable, including equations with fractional coefficients (e.g., using the balance analogy, computer algebra systems, paper and pencil)
ML1.02 determine the value of a variable in the first degree, using a formula (i.e., by isolating the variable and then substituting known values; by substituting known values and then solving for the variable) (e.g., in analytic geometry, in measurement)
ML1.03 express the equation of a line in the form $y = mx + b$ given the form $Ax + By + C = 0$

Teaching Suggestions
Chapter Opener
- Discuss how meteorologists use equations to represent atmospheric structure and motion as well as to write forecasting programs for computers.
- Ask students to brainstorm on how linear equations are used in other fields. Examples might include nurses who determine medication doses, merchants who analyse supply and demand, and fuel technicians who calculate the amount of fuel for aircraft.
- In this chapter, the students will learn how to manipulate and solve linear equations. They will find a variety of quantities, such as the amount of simple interest earned on an investment and the time a trip of a given length will take.

Literacy Link
- Have students make a Concept Circle to summarize methods involved in solving equations. Remind students to put related methods and steps in a section.
- You may wish to have students use **BLM 4.CO.1 Literacy Link: Concept Circle** for this activity.
- Distribute a new copy of **BLM 4.CO.1 Literacy Link: Concept Circle** at the start of each new section.
- You may wish to have students review the methods used to solve equations in the previous sections at the start of each new section or review all the methods in the Chapter Review.
- For more information on the Think Literacy program, visit http://www.edu.gov.on.ca/eng/studentsuccess/thinkliteracy.

Career Profile
- Have students discuss their understanding of a career in market research. As an extension of the discussion, have students research this career and similar careers, and have students present their findings to the class. You may wish to use **BLM A11 Presentation Checklist** to assess students' presentations. Then, using their research, have students discuss
  - what a market researcher does
  - what education and training are needed for this career
  - what other careers are similar
  - what are the differences in the training and education required for various similar careers
- Have students include their research in their Portfolios.

Chapter 4 Planning Chart

Section Suggested Timing	Student Text Page(s)	Teacher's Resource Blackline Masters	Assessment	Tools
Chapter 4 Opener • 10–15 min	150–151	• BLM 4.CO.1 Literacy Link: Concept Circle	• BLM A11 Presentation Checklist	
Get Ready! • 80 min	152–153	• BLM 4.GR.1 Practice: Get Ready	• BLM 4.GR.2 Get Ready Self-Assessment Checklist	• algebra tiles • calculators • integer tiles
4.1 Solve One- and Two-Step Linear Equations • 80–160 min	154–162	• BLM 4.1.1 Practice: Solve One- and Two-Step Linear Equations • BLM G1 Grid Paper	• BLM 4.1.2 Achievement Check Rubric • BLM A3 Communication General Scoring Rubric	• calculators • grid paper • rulers
4.2 Solve Multi-Step Linear Equations • 80–160 min	163–173	• BLM 4.1.1 Practice: Solve Multi-Step Linear Equations • BLM 4.CO.1 Literacy Link: Concept Circle • BLM T2 The Computer Algebra System (CAS) on the TI-89 Calculator	• BLM A4 Application General Scoring Rubric	• algebra tiles • chart paper • Computer Algebra System (CAS)
4.3 Model With Formulas • 80–160 min	174–183	• BLM 4.1.1 Practice: Model With Formulas • BLM 4.CO.1 Literacy Link: Concept Circle • BLM T2 The Computer Algebra System (CAS) on the TI-89 Calculator	• BLM 4.3.2 Achievement Check Rubric	• Computer Algebra System (CAS) • graphing calculators
4.4 Convert Linear Equations From Standard Form • 80–160 min	184–189	• BLM 4.1.1 Practice: Convert Linear Equations From Standard Form • BLM 4.CO.1 Literacy Link: Concept Circle • BLM G1 Grid Paper		• grid paper
Chapter 4 Review • 80 min	190–191	• BLM 4.CR.1 Chapter 4 Review		• calculators
Chapter 4 Practice Test • 80–160 min	192–193		• BLM 4.PT.1 Chapter 4 Practice Test • BLM 4.CT.1 Chapter 4 Test	• calculators
Chapter 4 Problem Wrap-Up • 30 min	193		• BLM 4.CP.1 Chapter 4 Problem Wrap-Up Rubric	• calculators

Chapter 4 Blackline Masters Checklist

		Title	Purpose
Chapter 4 Opener			
	BLM 4.CO.1	Literacy Link: Concept Circle	Literacy
	BLM A11	Presentation Checklist	Assessment
Get Ready!			
	BLM 4.GR.1	Practice: Get Ready	Practice
	BLM 4.GR.2	Get Ready Self-Assessment Checklist	Self-Assessment
4.1 Solve One- and Two-Step Linear Equations			
	BLM 4.1.1	Practice: Solve One- and Two-Step Linear Equations	Practice
	BLM 4.1.2	Achievement Check Rubric	Assessment
	BLM A3	Communication General Scoring Rubric	Assessment
	BLM G1	Grid Paper	Student Support
4.2 Solve Multi-Step Linear Equations			
	BLM 4.2.1	Practice: Solve Multi-Step Linear Equations	Practice
	BLM 4.CO.1	Literacy Link: Concept Circle	Literacy
	BLM A4	Application General Scoring Rubric	Assessment
	BLM T2	The Computer Algebra System (CAS) on the TI-89 Calculator	Technology
4.3 Model With Formulas			
	BLM 4.3.1	Practice: Model With Formulas	Practice
	BLM 4.3.2	Achievement Check Rubric	Assessment
	BLM T2	The Computer Algebra System (CAS) on the TI-89 Calculator	Technology
4.4 Convert Linear Equations From Standard Form			
	BLM 4.4.1	Practice: Convert Linear Equations From Standard Form	Practice
	BLM G1	Grid Paper	Student Support
Chapter 4 Review			
	BLM 4.CR.1	Chapter 4 Review	Review
Chapter 4 Practice Test			
	BLM 4.PT.1	Chapter 4 Practice Test	Diagnostic Assessment
	BLM 4.CT.1	Chapter 4 Test	Summative Assessment
Chapter 4 Problem Wrap-Up			
	BLM 4.CP.1	Chapter 4 Problem Wrap-Up Rubric	Summative Assessment

Get Ready!

Common Errors

- Some students may struggle with the questions on fractions.
- R_x Have each student work with a partner on these questions and be sure to circulate as students work on the Get Ready.

Accommodations

Motor—Have students work with a partner when working with algebra or integer tiles.

Teaching Suggestions

- The Get Ready is a basic review of the algebraic skills students need to work successfully with linear equations. Stress the importance of these algebraic skills.
- Allow each student to work with a partner on the Get Ready, and circulate while students work on the questions to assess students' strengths and weaknesses. Use this opportunity to identify students who will be stronger on the material in the chapter. This information will aid in making partners and groups for the activities in the chapter.
- Use **BLM 4.GR.1 Practice: Get Ready** for extra practice or remediation.
- Answers to the Get Ready questions can be taken up in class or collected to provide a diagnostic assessment of students' prior knowledge and understanding.
- You may wish to have students use **BLM 5.GR.2 Get Ready Self-Assessment Checklist** to identify the skills with which they need extra help.

Assessment

- Assess student readiness to proceed by informal observation as students are working on the questions. A formal test would be inappropriate since this material is not part of the grade 10 curriculum for this chapter.
- Student self-assessment is also an effective technique; students can place a checkmark beside topics in the Get Ready in which they feel confident with the necessary skills. You may wish to use **BLM 4.GR.2 Get Ready Self-Assessment Checklist** as a self-assessment for students. Remedial action can be taken in small groups or with a whole class skills review.

Chapter Problem

- A Chapter Problem is introduced in the Get Ready. Have students discuss their understanding of Angela's task.
- You may wish to have students complete the Chapter Problem revisits that occur throughout the chapter. These questions are designed to help students move toward the Chapter Problem Wrap-Up. Alternatively, you may wish to assign the Chapter Problem questions and Chapter Problem Wrap-Up when students have completed the chapter, as part of a summative assessment.