

Chapter 8 Planning Chart: Equations and Relationships

Cross-Curricular Competency: Exercises critical judgment. Lesson 6 provides students with an opportunity create a problem to match a given equation and then to solve the problem and explain the solution. Students must also improve upon solutions provided in the Student Book. Critical judgment of the provided solutions and the students' own solutions are fostered in this lesson.

Broad Area of Learning: Health and Well-Being. Learn about the Math in Lesson 3, Question 12 in Lesson 4, and the Chapter Task provide opportunities to focus on issues of health and well-being.

Content	QEP Concepts	QEP Processes	Addressing Concepts and Processes
Getting Started: Understanding Number Tricks, pp. 250–251			Assessment Opportunity: Use prompts A–F and Questions 1–3, 4a), 5–9.
Lesson 1: Solving Equations by Graphing, pp. 252–255	<i>Algebra: Understanding Algebraic Expressions</i> <ul style="list-style-type: none"> Algebraic Expression <ul style="list-style-type: none"> Variable Equality, equation and unknown 	<i>Algebra</i> <ul style="list-style-type: none"> Constructing an algebraic expression Numerical evaluation of an algebraic expression Solving first-degree equations with one unknown <ul style="list-style-type: none"> Validation of the solution by substitution Overall representation of a situation by means of a graph 	Prompt B instructs students to “draw a scatter plot. This reference can be changed to “draw a graph”.
Lesson 2: Representing Pattern Relationships, pp. 256–257	<i>Algebra: Understanding Algebraic Expressions</i> <ul style="list-style-type: none"> Algebraic Expression <ul style="list-style-type: none"> Variable Equality, equation and unknown 	<i>Algebra</i> <ul style="list-style-type: none"> Constructing an algebraic expression Numerical evaluation of an algebraic expression Solving first-degree equations with one unknown <ul style="list-style-type: none"> Validation of the solution by substitution Overall representation of a situation by means of a graph 	
Curious Math: A Winning Formula for Billiards, p. 257	<i>Algebra: Understanding Algebraic Expressions</i> <ul style="list-style-type: none"> Algebraic Expression <ul style="list-style-type: none"> Variable Equality, equation and unknown 	<i>Algebra</i> <ul style="list-style-type: none"> Numerical evaluation of an algebraic expression 	Optional
Lesson 3: Creating and Evaluating Algebraic Expressions, pp. 258–261	<i>Algebra: Understanding Algebraic Expressions</i> <ul style="list-style-type: none"> Algebraic Expression <ul style="list-style-type: none"> Variable 	<i>Algebra</i> <ul style="list-style-type: none"> Constructing an algebraic expression Numerical evaluation of an algebraic expression 	
Lesson A: Parts of an Algebraic Expression	<i>Algebra: Understanding Algebraic Expressions</i> <ul style="list-style-type: none"> Algebraic Expression <ul style="list-style-type: none"> Variable Coefficient Degree Terms, like terms 	<i>Algebra</i> <ul style="list-style-type: none"> Constructing an algebraic expression 	New Lesson Student Resource Teacher Resource
Lesson B: Addition and Subtraction of Algebraic Expressions	<i>Algebra: Understanding Algebraic Expressions</i> <ul style="list-style-type: none"> Algebraic Expression <ul style="list-style-type: none"> Variable Coefficient Degree Terms, like terms 	<i>Algebra</i> <ul style="list-style-type: none"> Recognizing and finding equivalent algebraic expressions Manipulating algebraic expressions <ul style="list-style-type: none"> Addition and subtraction 	New Lesson Student Resource Teacher Resource

Content	QEP Concepts	QEP Processes	Addressing Concepts and Processes
Lesson C: Multiplying and Dividing an Algebraic Expression	<p><i>Arithmetic: Number Sense With Regard to Decimal and Fractional Notation and Operation Sense</i></p> <ul style="list-style-type: none"> Properties of operations: <ul style="list-style-type: none"> Distributive property of multiplication over addition or subtraction and factoring out the common factor <p><i>Algebra: Understanding Algebraic Expressions</i></p> <ul style="list-style-type: none"> Algebraic Expression <ul style="list-style-type: none"> Variable Coefficient Degree Terms, like terms 	<p><i>Algebra</i></p> <ul style="list-style-type: none"> Recognizing and finding equivalent algebraic expressions Numerical evaluation of an algebraic expression Manipulating algebraic expressions <ul style="list-style-type: none"> Multiplication and division by a constant 	<p>New Lesson Student Resource Teacher Resource</p>
Lesson D: Monomial Multiplication	<p><i>Algebra: Understanding Algebraic Expressions</i></p> <ul style="list-style-type: none"> Algebraic Expression <ul style="list-style-type: none"> Variable Coefficient Degree Terms, like terms 	<p><i>Algebra</i></p> <ul style="list-style-type: none"> Recognizing and finding equivalent algebraic expressions Numerical evaluation of an algebraic expression Manipulating algebraic expressions <ul style="list-style-type: none"> Multiplication of first-degree monomials 	<p>New Lesson Student Resource Teacher Resource Example 2 and Questions 4, 6c–i, k–m, and 10 involve monomials that are not first-degree.</p>
Mid-Chapter Review: pp. 262–263			Assessment Opportunity
Lesson 4: Solving Equations I, pp. 264–267	<p><i>Algebra: Understanding Algebraic Expressions</i></p> <ul style="list-style-type: none"> Algebraic Expression <ul style="list-style-type: none"> Variable Equality, equation and unknown 	<p><i>Algebra</i></p> <ul style="list-style-type: none"> Constructing an algebraic expression Numerical evaluation of an algebraic expression Manipulating algebraic expressions <ul style="list-style-type: none"> Multiplication and division by a constant Solving first-degree equations with one unknown <ul style="list-style-type: none"> Validation of the solution by substitution Overall representation of a situation by means of a graph 	<p>It may be necessary to supplement the lesson with more difficult scenarios in which students are to write and solve an algebraic equation. For example, John, Jim, and Jerry are brothers. John is twice as old as Jim. Jim is 3 years younger than Jerry. The sum of their ages is 35. If x represents Jim's age, what are their ages? (Jim is 8, John is 16, Jerry is 11.)</p>
Lesson 5: Solving Equations II, pp. 268–271	<p><i>Algebra: Understanding Algebraic Expressions</i></p> <ul style="list-style-type: none"> Algebraic Expression <ul style="list-style-type: none"> Variable Equality, equation and unknown 	<p><i>Algebra</i></p> <ul style="list-style-type: none"> Constructing an algebraic expression Numerical evaluation of an algebraic expression Manipulating algebraic expressions <ul style="list-style-type: none"> Multiplication and division by a constant Solving first-degree equations with one unknown <ul style="list-style-type: none"> Validation of the solution by substitution 	<p>Teaching and Learning: To address the concept <i>Algebra: Understanding Algebraic Expressions</i> First-degree equation with one unknown expressed in the form $ax + b = cx + d$, supplement the lesson with examples of solving equations of the type mentioned. Consolidation: You may provide the following exercises (or others of your choosing) for students to practice the concept mentioned above. Answers appear to the right of each equation.</p> <ol style="list-style-type: none"> $3x + 1 = 2x + 2$ $x = 1$ $2y + 10 = 5y + 1$ $y = 3$ $3x - 4 = 6x + 2$ $x = -2$ $7y - 1 = 6y - 1$ $y = 0$ $9a = 7a + 2$ $a = 1$ $4b + 1 = 2b + 3$ $b = 1$ $8c - 4 = 12c + 4$ $c = -2$ $7.5d - 1 = 4.5d - 8.5$ $d = -2.5$

Content	QEP Concepts	QEP Processes	Addressing Concepts and Processes
Mental Math: Multiplying Mixed Numbers Part by Part, p. 272	<p><i>Arithmetic: Number Sense With Regard to Decimal and Fractional Notation and Operation Sense</i></p> <ul style="list-style-type: none"> • Reading, writing, various representations, patterns, properties • Fractional, decimal and exponential (integral exponent) notation; percentage, square root 	<p><i>Arithmetic: Different Ways of Writing and Representing Numbers</i></p> <ul style="list-style-type: none"> • Recognizing and using equivalent ways of writing numbers: <ul style="list-style-type: none"> • Decomposition of numbers (e.g. additive, multiplicative) <p><i>Arithmetic: Operations Involving Numbers Written in Decimal and Fractional Notation</i></p> <ul style="list-style-type: none"> • Mental computation: the four operations, especially with numbers written in decimal notation, using equivalent ways of writing numbers and the properties of operations 	
Math Game: Alge-Scrabble, p. 273	<p><i>Algebra: Understanding Algebraic Expressions</i></p> <ul style="list-style-type: none"> • Algebraic Expression <ul style="list-style-type: none"> • Variable • Equality, equation and unknown 	<p><i>Algebra</i></p> <ul style="list-style-type: none"> • Constructing an algebraic expression • Numerical evaluation of an algebraic expression • Manipulating algebraic expressions <ul style="list-style-type: none"> • Multiplication and division by a constant • Solving first-degree equations with one unknown <ul style="list-style-type: none"> • Validation of the solution by substitution 	Optional
Lesson 6: Communicating about Equations, pp. 274–276	<p><i>Algebra: Understanding Algebraic Expressions</i></p> <ul style="list-style-type: none"> • Algebraic Expression <ul style="list-style-type: none"> • Variable • Equality, equation and unknown 	<p><i>Algebra</i></p> <ul style="list-style-type: none"> • Numerical evaluation of an algebraic expression • Manipulating algebraic expressions <ul style="list-style-type: none"> • Multiplication and division by a constant • Solving first-degree equations with one unknown <ul style="list-style-type: none"> • Validation of the solution by substitution 	
Chapter Self-Test: p. 277			Self-Assessment Opportunity
Chapter Review: pp. 278–279			Assessment Opportunity
Chapter Task: The Chocolate Equation, p. 280	<p><i>Algebra: Understanding Algebraic Expressions</i></p> <ul style="list-style-type: none"> • Algebraic Expression <ul style="list-style-type: none"> • Variable • Equality, equation and unknown 	<p><i>Algebra</i></p> <ul style="list-style-type: none"> • Constructing an algebraic expression • Numerical evaluation of an algebraic expression • Manipulating algebraic expressions <ul style="list-style-type: none"> • Multiplication and division by a constant • Solving first-degree equations with one unknown <ul style="list-style-type: none"> • Validation of the solution by substitution 	Assessment Opportunity
Math in Action: Entrepreneur, pp. 281–282			Beyond Cycle One. Do not assess.