

I N S I D E
ALGEBRA

REVIEWER GUIDE

Get to Know

I N S I D E ALGEBRA

Getting Started

1. Watch *Inside Algebra* Video
2. Review Standards Alignment
3. *Inside Algebra* Materials
4. Log in to *Inside Algebra*
5. Teacher Center Overview
6. Access the Teacher Guide

Instruction & Pedagogy

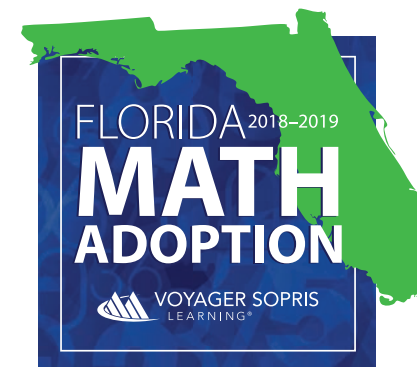
1. Interactive Standards Alignment
2. Curriculum Structure
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Assessments & Reports

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2. Student Center Overview
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► Watch the *Inside Algebra* Overview Video

1. Visit the *Inside Algebra* Adoption Review Website
2. View the video on the *Inside Algebra* review site for an overview of the program and purpose.

FLORIDA 2018-2019 MATH ADOPTION
VOYAGER SOPRIS

**I N S I D E
ALGEBRA**
Welcome, Florida Math Adoption Reviewers!

Inside Algebra is an intensive Algebra 1 course that engages students with multisensory manipulatives, supports students with prerequisite skill lessons, and enriches students with a variety of differentiation opportunities. Each lesson follows an effective three-step design that includes: (1) conceptual development activities, (2) practice activities using games and small-group activities, and (3) problem-solving activities to illustrate real-world relevance. *Inside Algebra* is particularly suited for students who have struggled throughout foundational math courses or have previously been unsuccessful in Algebra 1. *Inside Algebra* is THE core for students in need of additional support to ensure algebra success.

DOWNLOAD THE REVIEWER GUIDE
We have created a comprehensive Reviewer Guide with step-by-step instructions for the digital review process. Please download and have this guide available before you begin to review.
[DOWNLOAD NOW](#)

WATCH THE OVERVIEW VIDEO
Watch the brief overview video to get an introduction to *Inside Algebra* before beginning your exploration.

MAFS ALIGNMENT & OTHER RESOURCES
We have provided the following resources online to support your review of the materials.
Alignment to MAFS • Publisher Questionnaire
UDL Questionnaire • System Requirements
Bid Details

EXPLORE INSIDE ALGEBRA
Please have your Reviewer Guide available to log in and effectively navigate through the digital materials and begin with the Teacher Experience.
[ENTER THE STUDENT CENTER](#)
[ENTER THE TEACHER CENTER](#)

► Review the Standards Alignment Document

Inside Algebra aligns to all the standards for the Algebra 1-A and Algebra 1-B courses..

1. **Download this document** to view a complete list of MAFS and Course standards covered in *Inside Algebra*.
2. During the Instructional Design section of this Reviewer Guide, **you will be directed to several examples of standards coverage** using the live links of the Interactive Standards Alignment tool in the eBook.



The screenshot shows the 'Welcome, Florida Math Adoption Reviewers!' page. It features a navigation menu with 'GETTING STARTED' and 'INSTRUCTIONAL DESIGN'. The main content area includes a video player for an overview video, a 'DOWNLOAD THE REVIEWER GUIDE' button, and a section for 'STANDARDS ALIGNMENT & OTHER RESOURCES' with links to various documents. A large black mouse cursor arrow points to the 'STANDARDS ALIGNMENT & OTHER RESOURCES' section.

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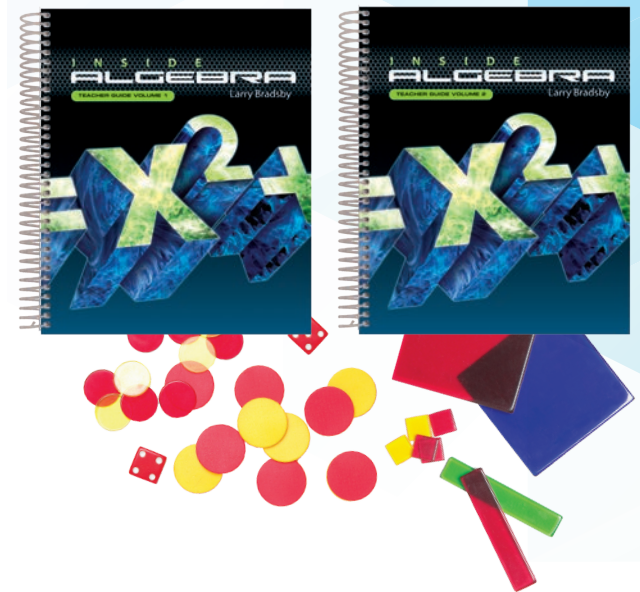
EXPLORE INSIDE ALGEBRA
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[ENTER THE STUDENT CENTER](#)
[ENTER THE TEACHER CENTER](#)

► All *Inside Algebra* Materials

This Reviewer Guide was created for Florida educators to explore and review all *Inside Algebra* components in a digital format. Outside of this Guide, *Inside Algebra* is available as a blend of print materials and engaging technology.

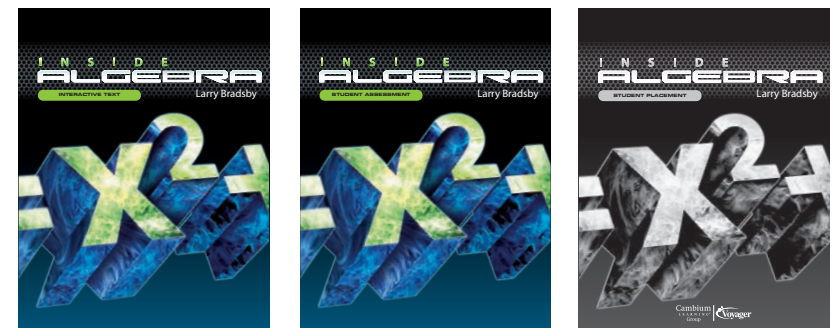
Teacher Materials:

- Teacher Guides (Two-volume set)
- Teacher Placement Guide
- VPORT® Online Data Management System
- Online Resources
- Access to Selected ExploreLearning *Gizmos*
- Algebra Skill Builders Blackline Masters
- Hands-on Manipulatives Class Set



Student Materials:

- Student Interactive Text
- Assessment Book
- Student Placement Test
- Access to Selected ExploreLearning *Gizmos*



► Log in to the *Inside Algebra* Teacher Center

1. **Click on Enter the Teacher Center** from the Adoption Review site to begin.

Please note Voyager Sopris Learning® offers single sign-on integrations to simplify accessibility and interoperate with pre-existing district technologies.

2. **Enter the username and password below** to enter the *Inside Algebra* Teacher Center website.

Username: **Insidealgebrad16**

Password: **Livekite0**



FLORIDA MATH ADOPTION
VOYAGER SOPRIS LEARNING

I N S I D E ALGEBRA

Welcome, Florida Math Adoption Reviewers!

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EXPLORE INSIDE ALGEBRA
Please have your Reviewer Guide available to log in and effectively navigate through the digital materials and begin with the Teacher Experience.

ENTER THE STUDENT CENTER

ENTER THE TEACHER CENTER

► Teacher Center Overview

The Teacher Center is the landing page from which teachers can access all digital materials and resources used in *Inside Algebra* including:

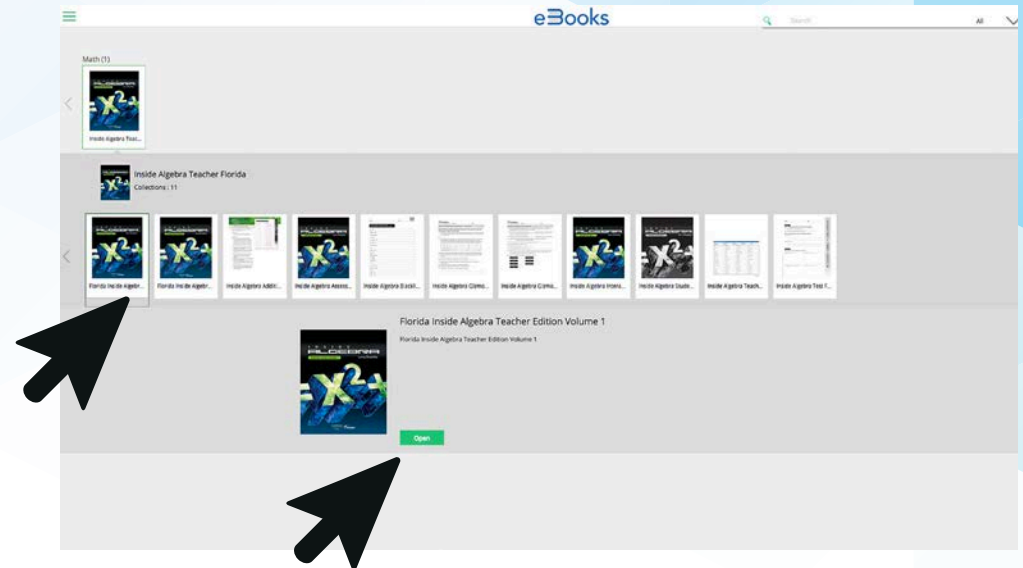
- eBooks:** Includes digital versions of the print and digital-only books.
- ExploreLearning Gizmos:** Provides access to digital manipulatives
- Student Progress:** Links to specific reports and data.

The screenshot shows the Inside Algebra Teacher Center interface. At the top, there is a navigation bar with 'Access', 'Messages (0)', 'Demo Inside Algebra', 'Profile', and 'Log Out'. Below this is a header with 'INSIDE ALGEBRA' and dropdown menus for 'TRACK' (Florida Adoption - Inside Alge...), 'SCHOOL' (Voyager School 11A), and 'CLASS' (Inside Algebra IA). A breadcrumb trail reads 'Florida Adoption > Inside > Voyager School 11A > Inside Algebra IA > Home > HomePage'. A secondary navigation bar includes 'Home', 'My Results', 'My Class', 'Support', and 'Tools'. The main content area is titled 'Home Page for Inside Algebra IA > Florida Adoption - Inside Algebra - IA 2017-2018'. It features three main sections: 'Resources' with 'eBooks' (Digital Materials) and 'Gizmos' (Student App, Guided Discovery); 'Student Progress' with links for 'Key Measures of Progress', 'Scores Report', 'Student / Parent Report', and 'Custom Reports'; and 'Assessment' with links for 'Enable Online Assessments' and 'Enter Scores Manually'. A right sidebar contains 'Benchmark Dates' (Not Set), 'Support Only' (Call 1.800.547.6747, 8:30 AM - 5:30 PM Central, Email our support team), and 'Administer Class' (Class Roster, Pacing Calendar).

► Access Teacher Guide eBooks



1. **Click on the eBooks icon** from the Teacher Center bookshelf.



2. **Select the book entitled Florida Inside Algebra Teacher Edition Volume 1.** Depending on your screen, you may need to click the right scroll arrow to view all books.
3. **Click the green "Open" button to enter.** The eBook has fully loaded once the toolbar appears across the top.

Instruction & Pedagogy

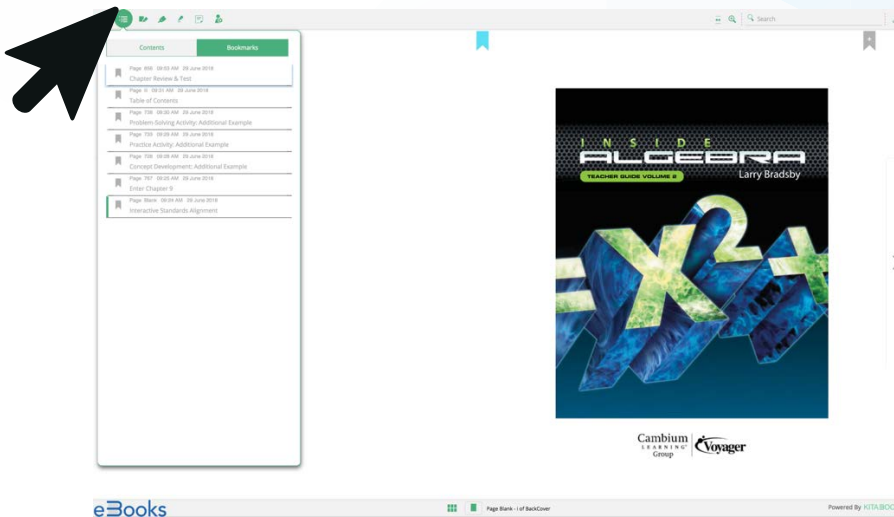
Take a look at *Inside Algebra's* unique instruction, pedagogy, and the supportive tools and resources that make it easy for teachers to implement and effective for students to achieve mastery in algebra.

THIS SECTION ADDRESSES:

- Interactive Standards Alignment
- Curriculum Structure
- Planning & Prep
- Instructional Design

▶ Review Interactive Standards Alignment

Explore how *Inside Algebra* aligns to the MAFS and course standards. The Interactive Standards Alignment tool provides an easy way for teachers to search and review the standards inside the instruction.



1. **Click** the Contents icon in the toolbar on top.
Click Bookmarks.
Click Interactive Standards Alignment.

2. The Interactive Standards Alignment tool links directly to the point of instruction where a standard is taught.

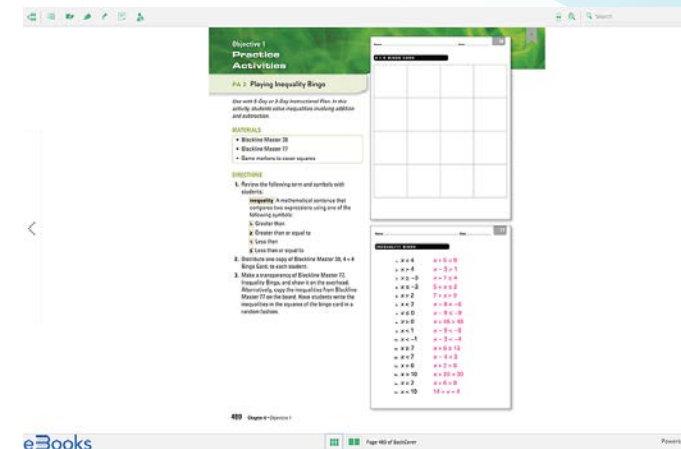
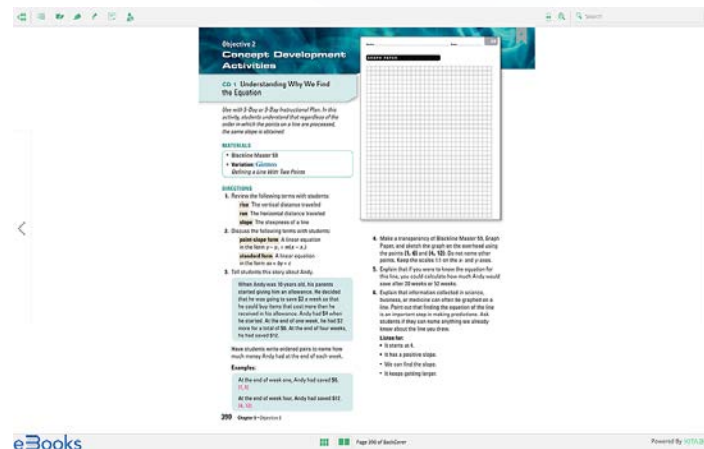
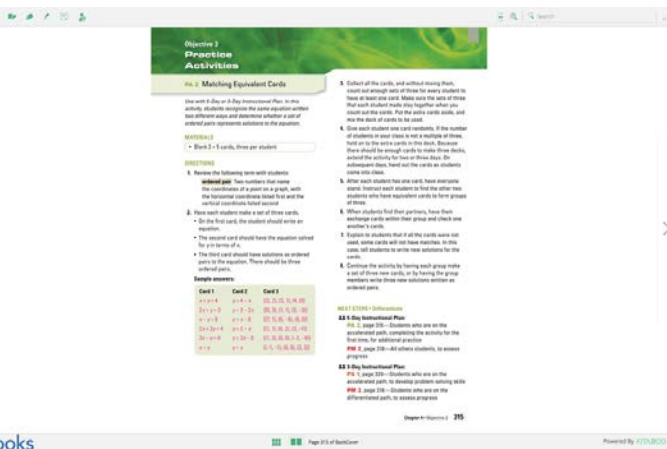
► Review Interactive Standards Alignment

RELATIONSHIPS BETWEEN QUANTITIES & REASONING WITH EQUATIONS

Please review a few examples of how *Inside Algebra* covers standards related to **Relationships Between Quantities and Reasoning with Equations**, a critical area of Algebra 1A.

To view examples in eBooks:

1. **Click** the Contents icon in the toolbar on top.
Click Bookmarks.
Click on the corresponding MAFS standard from the examples below.



#1 MAFS.912.A-CED.1.2: Teacher Guide Volume 1, page 315

#2 MAFS.912.A-SSE.1.1: Teacher Guide Volume 1, page 390

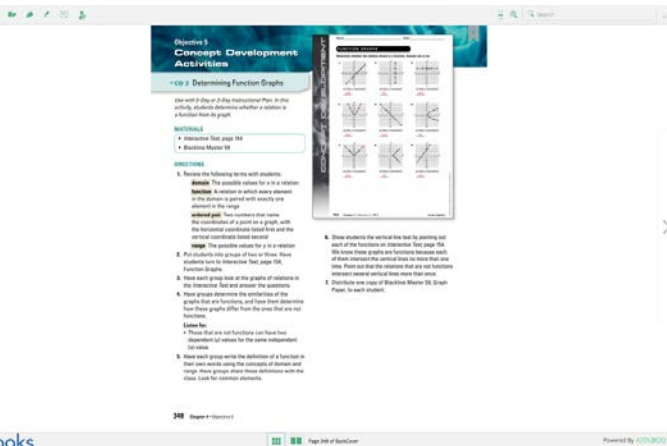
#3 MAFS.912.A-REI.4.12: Teacher Guide Volume 1, page 480

► Review Interactive Standards Alignment LINEAR & EXPONENTIAL EQUATIONS

Please review a few examples of how *Inside Algebra* covers standards related to **Linear and Exponential Equations**, a critical area of Algebra 1A.

These examples begin in *Florida Inside Algebra Teacher Edition Volume 1*. After #4 MAFS Standard, please return to the Teacher Center and click on eBooks. In the eBookshelf, choose *Florida Inside Algebra Teacher Edition Volume 2* to continue your review. To view standards examples in the eBooks:

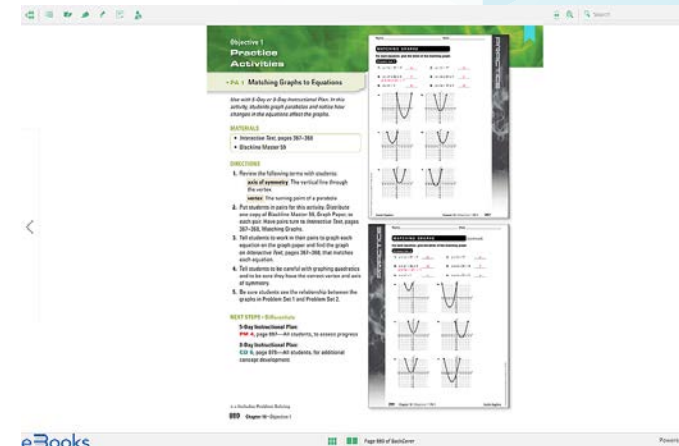
1. **Click** the Contents icon in the toolbar on top.
Click Bookmarks.
Click on the corresponding MAFS standard from the examples below.



#4 MAFS.912.F-IF.1.2: Teacher Guide
Volume 1, page 348



#5 MAFS.912.A-CED.1.3: Teacher Guide
Volume 2, page 582



#6 MAFS.912.F-BF.1.1: Teacher Guide
Volume 2, page 880

► Review Interactive Standards Alignment EXPRESSIONS & EQUATIONS

Please review a few examples of how *Inside Algebra* covers standards related to **Expressions and Equations**, a critical area of Algebra 1B.

To view examples in eBooks:

1. **Click** the Contents icon in the toolbar on top.
Click Bookmarks.
Click on the corresponding MAFS standard from the examples below.

Objective 3
Problem-Solving Activities

PS 1 Matching Equations

Use with 5-Day or 3-Day Instructional Plan. In this activity, students identify a system of equations as having zero, one, or infinitely many solutions using substitution.

MATERIALS

- Interactive Text, page 270

DIRECTIONS

1. Review the following term with students:
 - substitution.** Removing one variable from a system of equations by rewriting the system in terms of the other variable.
2. Have students work individually on this activity. Have students turn to Interactive Text, page 270, Matching Equations.
3. Monitor student work, watching to see that students put equation 0 into slope-intercept form, then use the slope and y-intercept of the equations to classify each system as having zero, one, or infinitely many solutions. On Problem 4, students should explain their decision-making process using complete sentences. Check to see that students realize that by finding the pairs of equations that represent the same line they can reduce the number of pairs to check for one or no solutions.

NEXT STEPS - Differentiate

5-Day Instructional Plan:
Objective 3 Posttest, page 623—All students

3-Day Instructional Plan:
PS 2, page 622—All students, for additional problem solving

Chapter 3 • Objective 3 621

#7 MAFS.912.A-CED.1.1: Teacher Guide Volume 2, page 621

Objective 3
Concept Development Activities

CD 4 Solving a Quadratic Equation Using the Quadratic Formula

Use with 5-Day or 3-Day Instructional Plan. In this activity, students solve a quadratic equation written in standard form using the quadratic formula.

MATERIALS

- Calculators
- Variation: Girazuro Roots of a Quadratic

DIRECTIONS

1. Review the following terms with students:
 - roots.** The solutions of an equation
 - zeros of a function.** The points at which the function crosses the x-axis
2. Write $ax^2 + bx + c = 0$ on the board, and explain that an equation in this form can be solved using the quadratic formula. Tell students the first step is to identify the values of a , b , and c . Remind them that if no coefficient is written for x^2 , it is the same as $a = 1$ by the Multiplicative Identity Property ($1 \cdot x^2 = x^2$).
3. Write $x^2 + 7x - 8 = 0$ on the board. Some students might recognize the quadratic is factorable, and the roots are -8 and 1 . Assure them that factoring, if possible, is the easier way to solve the problem, but not all quadratics are factorable.
4. Ask students to identify the values of a , b , and c for $x^2 + 7x - 8 = 0$. $a = 1$, $b = 7$, and $c = -8$
5. Have one student read the quadratic formula from his or her notes. Write it on the board.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$
6. Work with students to substitute the values for a , b , and c into the quadratic formula.

$$x = \frac{-7 \pm \sqrt{7^2 - 4(1)(-8)}}{2(1)}$$
7. Demonstrate how to simplify the values inside the radical. Work slowly as students can easily follow, and remind them of the order of operations as you proceed.

$$x = \frac{-7 \pm \sqrt{49 - (-32)}}{2}$$

$$x = \frac{-7 \pm \sqrt{49 + 32}}{2}$$

$$x = \frac{-7 \pm \sqrt{81}}{2}$$
8. Explain that the answer is separated into two parts at this point because of the \pm , and demonstrate how to find the solutions.

$$x = \frac{-7 + 9}{2} \text{ or } \frac{-7 - 9}{2}$$

$$x = \frac{2}{2} \text{ or } \frac{-16}{2}$$

$$x = 1, -8$$
9. Remind students that the quadratic was factorable and that factoring would have been an easier way to solve it. Also, mention that not all quadratics are factorable. Write $2x^2 - 5x - 6 = 0$ on the board to demonstrate a quadratic that is not factorable.
10. Have students identify a , b , and c for $2x^2 - 5x - 6 = 0$. $a = 2$, $b = -5$, and $c = -6$
11. Write the quadratic formula on the board.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Note: If you consistently write the formula from the beginning, the students will become more familiar with it and better able to use it.
12. Substitute the values for a , b , and c into the formula and simplify.

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(2)(-6)}}{2(2)}$$

$$x = \frac{5 \pm \sqrt{25 + 48}}{4}$$

$$x = \frac{5 \pm \sqrt{73}}{4}$$
13. Remind students that the answer is separated into two parts at this point because of the \pm , and demonstrate how to find the solutions. Round to the nearest hundredth.

$$x = \frac{5 + 8.54}{4} \text{ or } \frac{5 - 8.54}{4}$$

$$x = 3.39, -0.89$$
14. Relate these answers to the answers you would get if you graphed the quadratic.

Chapter 10 • Objective 3 911

#8 MAFS.912.A-REI.2.4: Teacher Guide Volume 2, page 911

Objective 5
Progress-Monitoring Activities

PM 1 Apply Skills 1

Use with 4-Day or 3-Day Instructional Plan.

MATERIALS

- Interactive Text, page 419

DIRECTIONS

1. Have students turn to Interactive Text, page 419, Apply Skills 1.
2. Remind students of the key term: least common denominator (LCD).
3. Monitor student work, and provide feedback as necessary.
 - Watch for:**
 - Do students remember to find the LCD for all three denominators?
 - Do students notice that the LCD can be the same as one of the denominators?

NEXT STEPS - Differentiate

4-Day and 3-Day Instructional Plans:
PM 1, page 1021—Students who demonstrate understanding of the concept, for additional practice and problem solving
CD 2, page 1019—Students who need additional concept development

Chapter 11 • Objective 5 1024

#9 MAFS.912.A-CED.1.1: Teacher Guide Volume 2, page 1024

► Review Interactive Standards Alignment QUADRATIC FUNCTIONS & MODELING

Please review a few examples of how *Inside Algebra* covers standards related to **Quadratic Functions and Modeling**, a critical area of Algebra 1B.

To view examples in eBooks (these examples will be in two different Teacher Guides):

1. **Click** the Contents icon in the toolbar on top.
Click Bookmarks.
Click on the corresponding MAFS standard from the examples below.

**Objective 5
Concept Development
Activity**

• CD 1 Using Algebra Tiles to Complete a Square

Use with 3-Day Instructional Plan A or 3-Day Instructional Plan B. In this activity, students factor quadratic trinomials by using algebra tiles to complete the square.

MATERIALS

- Algebra tiles, one set per pair of students
- Overhead algebra tiles

DIRECTIONS

1. Review the following terms with students:
 - difference of squares:** A binomial of the form $a^2 - b^2 = (a + b)(a - b)$
 - factor:** A monomial that evenly divides a value
 - perfect square:** The product of a monomial with itself, for example, x^2 , $16a^4$, or 49
 - quadratic formula:** $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ where $ax^2 + bx + c = 0$
 - quadratic trinomial:** A polynomial of the form $ax^2 + bx + c$
2. Write $x^2 + 4x + 1 = 0$ on the board.
3. Group students in pairs, and tell them to attempt to solve the quadratic equation using any method they have learned, for example, area rug, factoring, perfect squares, or difference of squares.
4. When most pairs of students realize they are not having any success, give a set of algebra tiles to each pair of students.
5. Have students attempt to build a rectangle that represents $x^2 + 4x + 1 = 0$ and is as close to a square as possible. Tell them there may appear to be a piece missing from a perfect square, but that is okay.
6. After a reasonable amount of time, if there are any students who are confident in their answer, allow them to present it to the class using a set of overhead algebra tiles.

7. Discuss the following term with students: **completing the square:** Adding to or subtracting from a quadratic equation to make it into a perfect square trinomial, a method used to find the solutions of a quadratic equation.

8. Tell students you will present a solution to the class and ask for their input. Show students the tiles below, and explain that they will represent the units in the problem.

1 unit

1 x^2 unit 4 x units

9. Show that $x^2 + 4x + 1 = 0$ can be represented by holding the diagram shown below. Ask students to identify what is missing from the diagram that would complete the square.

Draw the answer by showing that with three more single unit squares, the diagram would be a complete square.

10. Have students discuss what the dimensions of the new complete square would be. If necessary, point out that the dimensions would be $(x + 2)$ by $(x + 2)$.

11. Write $(x + 2)(x + 2) = 0$ on the board. Ask students if they can think of another way to write this expression in a more concise manner. ($(x + 2)^2$)

12. Remind students that the original diagram was not a complete square so they must subtract the three missing pieces from the new expression. Thus, the expression changes to $(x + 2)^2 - 3$.

848 Chapter 1 • Objective 5

#10 MAFS.912.A-REI.2.4: Teacher Guide
Volume 2, page 848

**Objective 1
Concept Development
Activities**

CD 5 Relating $y = ax^2$ and $y = x^2$

Use with 5-Day or 3-Day Instructional Plan. In this activity, students understand how the graph of $y = ax^2$ changes when a coefficient is placed in front of x^2 . Students also understand that a parabola in the form $y = ax^2$ has a vertex at $(0, 0)$ and an axis of symmetry of $x = 0$.

MATERIALS

- Blackline Master 59
- Graphing calculators (optional)
- Variation: Classroom Quadratics in Vertex Form—Activity A

DIRECTIONS

1. Review the following terms with students:
 - axis of symmetry:** The vertical line through the vertex.
 - parabola:** The graph of a quadratic equation; the shape resembles the letter U
 - vertex:** The turning point of a parabola
2. Write $y = 2x^2$ on the board, and make a table for the solutions. Start by writing 0 for x , and ask students to determine the corresponding y value. $y = 0$. Next, have students find the y value when $x = 1$, $y = 2$. Ask students what point would be symmetrical to the point $(1, 2)$. $(-1, 2)$ Fill in the table with these values.
3. Make a transparency of Blackline Master 59, Graph Paper. Plot the three points on the overhead.
4. Distribute one copy of Blackline Master 59, Graph Paper, to each student. Tell students to graph the points on their individual sheets of graph paper.
5. List several x values in the table, and have students find the corresponding y values. Have students plot the points on their papers. Also, tell them to determine and plot the points of symmetry. Have them draw a curved line through the points and name the coordinates of the vertex. $(0, 0)$

Example:

x	y
2	8 Point of symmetry $(-2, 8)$
3	18 Point of symmetry $(-3, 18)$

876 Chapter 1 • Objective 1

#11 MAFS.912.A-CED.1.2: Teacher Guide
Volume 2, page 876

**Objective 2
Problem-Solving
Activity**

PS 1 Writing Quadratics

Use with 4-Day or 3-Day Instructional Plan. In this activity, students write quadratic equations that have zero, one, or two roots.

MATERIALS

- Blackline Master 59

DIRECTIONS

1. Review the following terms with students:
 - roots:** The solutions of an equation
 - zeros of a function:** The points at which the function crosses the x -axis
2. Distribute a few copies of Blackline Master 59, Graph Paper, to each student.
3. Ask each student to write the equation of a quadratic function of the form $x^2 + bx + c = 0$ that has exactly one root. The values for b and c can be positive or negative, but b must be an even integer and not zero. Have students exchange papers and graph the equations they receive. Discuss the graphs. Answers will vary. A good way to come up with the equation is to start with a perfect square, such as $(x - 2)^2 = 0$, and multiply it out. A possible answer would be $x^2 - 4x + 4 = 0$.
4. Ask each student to write the equation of a quadratic function of the form $x^2 + bx + c = 0$ that has no real roots. The values for b and c can be positive or negative, but b must be an even integer and not zero. Have students exchange papers and graph the equations they receive. Discuss the graphs. Answers will vary. A good way to come up with the equation is to start with a perfect square polynomial equal to a negative integer; for example, $(x + 2)^2 = -3$, which becomes $x^2 + 4x + 7 = 0$.
5. Ask each student to write the equation of a quadratic function of the form $x^2 + bx + c = 0$ that has exactly two roots. The roots must be integers, and the values for b and c can be positive or negative, but b must be an even integer and not zero. Have students exchange papers and graph the equations they receive. Discuss the graphs. Answers will vary. A good way to come up with the equation is to start with a perfect square polynomial equal to a positive integer that is not a perfect square; for example, $(x - 1)^2 = 2$, which becomes $x^2 - 2x + 1 = 2$, or $x^2 - 2x - 1 = 0$.

NEXT STEPS - Differentiated

4-Day and 3-Day Instructional Plan:
Objective 2 Posttest, page 903—All students

902 Chapter 1 • Objective 2

#12 MAFS.912.A-REI.2.4: Teacher Guide
Volume 2, page 902

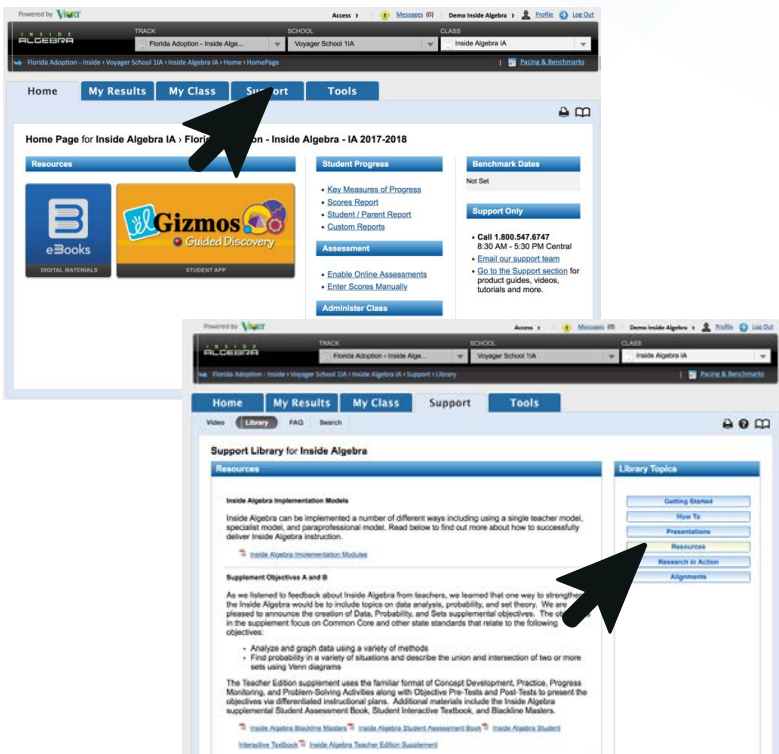
► Review Interactive Standards Alignment

DESCRIPTIVE STATISTICS

Please review a few examples of how *Inside Algebra* covers standards related to **Descriptive Statistics**, a critical area of Algebra 1B.

To view examples in eBooks:

1. **Click** the Support tab in the Teacher Center.
Click Resources on the right side.
Click and download the *Inside Algebra* Teacher Edition Supplement.



Objective A Problem-Solving Activities

PS 1 Comparing Graphs

Use with 6-Day or 4-Day Instructional Plan. In this activity, students use a Venn diagram to organize survey data.

MATERIALS

- Interactive Text Supplement, pages 12-13

DIRECTIONS

1. Review the following terms with students:
 - bar graph** A graph that is used to display and compare data
 - box-and-whisker plot** A graph that summarizes a data set by displaying it along a number line
 - median** The middle value in a data set when the values are arranged in order; if a set contains an even number of values, the median is the mean of the two middle values
 - stem-and-leaf plot** A graph that displays the values of a data set as stems and leaves
2. Have students work individually on this assignment.
3. Have students turn to *Interactive Text Supplement*, pages 12-13, *Comparing Graphs of Data*.
4. Tell students to look at the three graphs. They will use the characteristics of the graphs to fill in the table. They should write "yes" or "no" in the table for each graph.
5. Tell students to answer the questions. If possible, discuss students' responses in groups or as a class.

NEXT STEPS - Differentiate

- 6-Day Instructional Plan: PM 3**—All students, to assess progress
- 4-Day Instructional Plan: CD 4**—All students, for additional concept development

COMPARING GRAPHS OF DATA

The table shows the number of hours a student studied in one week.

Student	Mon	Tue	Wed	Thurs	Fri	Sat	Sun
John	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Michelle	1.5	1.5	1.5	1.5	1.5	1.5	1.5

1. Draw the data from the table to a graph.
2. What is the least value? 1.5
3. What is the greatest value? 1.5
4. What is the median of the data? 1.5

Objective A Problem-Solving Activities

PS 2 Analyzing Data in a Graph

Use with 6-Day or 4-Day Instructional Plan. In this activity, students will analyze data in a bar graph and a stem-and-leaf plot.

MATERIALS

- Blackline Master A6

DIRECTIONS

1. Review the following terms with students:
 - mean** The sum of the data values divided by the total number of data values; also referred to as the average
 - median** The middle value in a data set when the values are arranged in order; if a set contains an even number of values, the median is the mean of the two middle values
 - mode** The number(s) that occur most often in a data set; a set of data can have no mode, one mode, or more than one mode
 - range** The difference between the greatest and least values of a data set
2. Divide students into groups of two or three. Distribute one copy of Blackline Master A6, *Analyzing Data*, to each group.
3. Tell students that the bar graph shows the number of students enrolled in a French-language course at one school over a period of seven years.
4. Remind students that a bar graph is useful for comparing quantities or for observing how quantities change over time. Point out that this particular bar graph shows how the number of students enrolled in French classes at a school has changed over time.
5. Draw students' attention to the features of the bar graph. Point out that the years are placed along the horizontal axis in intervals of 1. Show students that the numbers of students enrolled in the French classes are placed along the vertical axis in intervals of 25. Remind students that each bar corresponds to a certain year and that the height of

MAFS.912.S-ID.1.1:
Teacher Guide
Supplement, page 24

MAFS.9.12.S-ID.3.9
Teacher Guide
Supplement, page 25

► Curriculum Structure: OBJECTIVES-BASED APPROACH

What is the Objectives-based Approach?

Inside Algebra is organized in a logical scope and sequence of objectives. Each chapter is divided into four-six objectives.

Why is the Objectives-based Approach important?

The objectives-based approach breaks down algebra skills and standards into smaller, accessible components that are more suited to students who have struggled with math. For teachers, this approach maximizes the potential for differentiating instruction and adapting to the needs of students.

Note on Chapter Layout:

All components within the objective are color-coded to clearly identify the purpose of each activity.

The screenshot shows the digital interface of *Inside Algebra*. At the top, there is a toolbar with several icons. A black mouse cursor points to the 'Contents' icon. Below the toolbar, a 'Contents' sidebar is open, listing various sections like 'Table of Contents', 'Chapter Review & Test', and 'Interactive Standards Alignment'. The main content area displays a detailed 'Table of Contents' for Chapter 9, 'Using Factoring', with sub-sections for five objectives. Each objective lists associated activities like 'Pretest', 'Concept Development Activities', 'Problem-Solving Activities', 'Practice Activities', and 'Posttest' with their respective page numbers. The interface is clean and modern, with a blue and white color scheme.

1. **Click** the Contents icon in the toolbar on top.
Click Bookmarks.
Click Table of Contents.

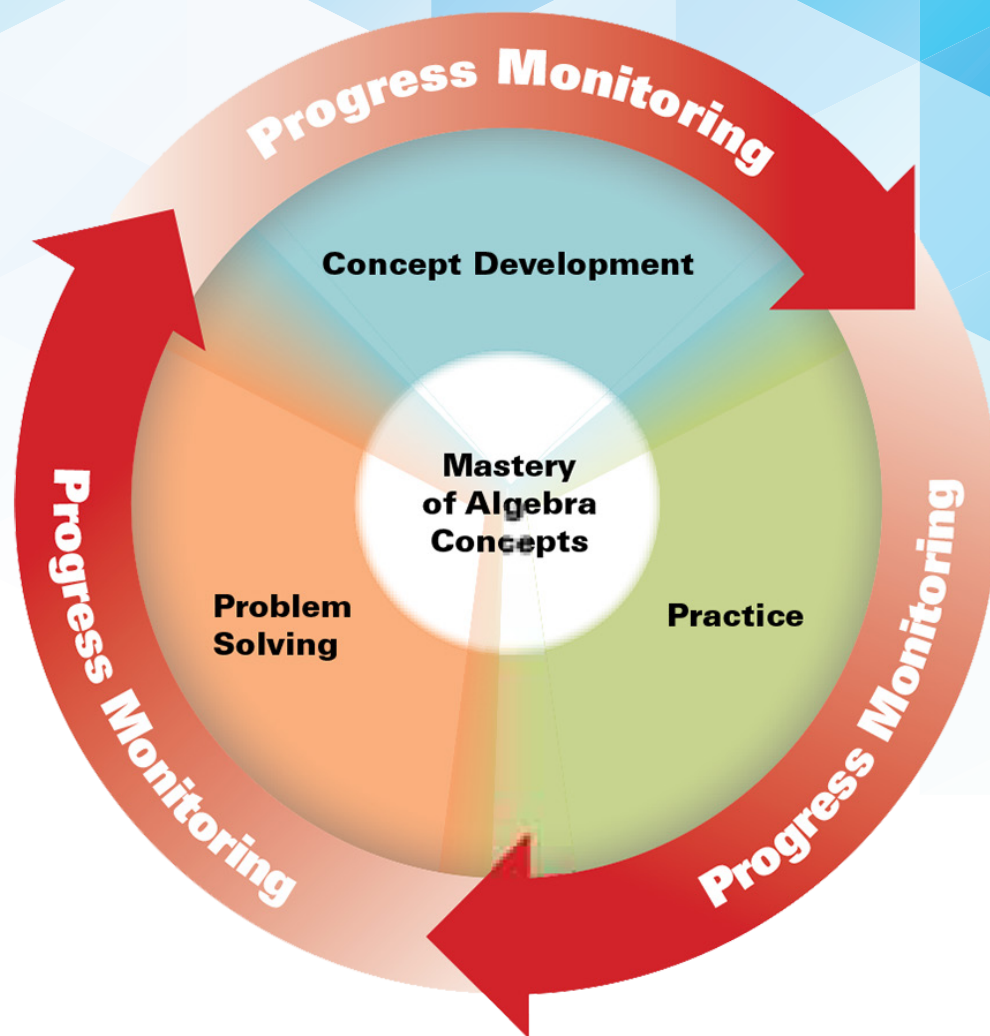
► Curriculum Structure: FOUR-STEP LESSON DESIGN

What is the Four-Step Lesson design?

Each objective includes a four-step lesson design with each step leading to mastery of algebra concepts. The four steps are **Concept Development**, **Practice**, **Progress Monitoring**, and **Problem Solving**.

Why is the Four-Step Lesson design important?

Supported by research and the National Mathematics Advisory Panel, the four-step design provides a balanced approach to algebra instruction that focuses on conceptual understanding, developing fluency in procedures and number operations, and building strong problem-solving skills.



► Planning & Prep: CHAPTER INTRODUCTION

The chapter Introduction page provides a summation and preview of the chapter's instructional purpose and the objectives that will lead to student mastery.

1. **Click** the Contents icon in the toolbar on top.
Click Bookmarks.
Click Enter Chapter 9 Introduction.

Using Factoring

In this chapter, students explore and gain an understanding of polynomials, including quadratic trinomials. They apply concepts of factoring to monomials and use a variety of factoring strategies with polynomials. Students use factoring and models as tools for solving quadratic polynomials.

Objective 1
Find the greatest common factor through prime factorization for integers and sets of monomials.

Objective 2
Use the greatest common factor and the Distributive Property to factor polynomials with the grouping technique, and use these techniques to solve equations.

Objective 3
Factor quadratic trinomials of the form $ax^2 + bx + c$, and solve equations by factoring.

Objective 4
Factor quadratic polynomials that are perfect squares or differences of squares, and solve equations by factoring.

Objective 5
Solve quadratic equations by completing the square.

Chapter 9 VOCABULARY

factor, page 772
greatest common factor (GCF), page 772
prime factorization, page 777
quadratic trinomial, page 808
quadratic formula, page 820
perfect square, page 826
perfect square trinomial, page 826
difference of squares, page 829
quadratic polynomial, page 829
completing the square, page 848

Chapter 9 767

Clearly defined **Objectives** for each chapter present concepts and skills in a logical sequence.

Key **Vocabulary** listed at the beginning of each chapter facilitates the pre-teaching of important math ideas.

► Planning & Prep: OBJECTIVE PRETEST

The Objective Pretest quickly assesses a student's pre-existing knowledge before instruction begins. Based on the results, teachers will determine the best pacing model for students to achieve mastery in the skill/concept.

1. **Click** the Contents icon in the toolbar on top.
- Click** Bookmarks.
- Click** Enter Chapter 9: Objective 3.

The screenshot shows the eBooks interface for Chapter 9, Objective 3. On the left, a navigation menu is open, showing 'Contents' and 'Bookmarks'. A mouse cursor points to the 'Contents' icon in the top toolbar. The main content area displays 'Objective 3 Goals and Activities'. Under 'Objective 3 Goals', it lists activities for factoring quadratic polynomials and solving quadratic equations. Below this, there are sections for 'Concept Development Activities', 'Practice Activities', 'Progress-Monitoring Activities', 'Problem-Solving Activities', and 'Ongoing Assessment'. The page number 804 is visible at the bottom left, and the page number 805 is visible at the bottom right.

9 CHAPTER Objective 3

Factor quadratic trinomials of the form $ax^2 + bx + c$, and solve equations by factoring.

Objective 3 Pretest

Students complete the Objective 3 Pretest on the same day as the Objective 2 Posttest.

Using the Results

- Score the pretest and update the class record card.
- If the majority of students do not demonstrate mastery of the concepts, use the 5-Day Instructional Plan for Objective 3.
- If the majority of students demonstrate mastery of the concepts, use the 4-Day Instructional Plan for Objective 3.

Each **Objective Pretest** provides baseline data to determine the instructional path.

The screenshot shows the Objective 3 Pretest worksheet. It is titled 'CHAPTER 9 • Objective 3 PRETEST'. The page is divided into two columns of problems. The left column contains problems 1 through 5, and the right column contains problems 2 through 7. Below these are problems 6 through 10. Each problem asks the student to factor a quadratic polynomial or solve a quadratic equation by factoring. The page number 128 is visible at the bottom left, and the page number 805 is visible at the bottom right.

► **Planning & Prep:**
OBJECTIVES GOAL PAGE

This page clearly states the ultimate goal of the objective with an at-a-glance view of all of the various activities in the four-step lesson design that will support instruction.

A color-coded **Objective Overview** outlines the different types of activities provided to meet the Objective Goals.

Objective 3
Goals and Activities

Objective 3 Goals

The following activities, when used with the instructional plans on pages 806 and 807, enable students to:

- Factor the quadratic polynomial $x^2 + 6x - 16$ to get $(x - 2)(x + 8)$
- Solve the quadratic equation $x^2 + 5x - 14 = 0$ to get $x = 2, -7$

Objective 3 Activities

Concept Development Activities				
CD 1 Using Algebra Tiles, page 808	*CD 2 Making Area Rugs, page 810	CD 3 Solving the Trinomial Equation, page 811		
Practice Activities				
*PA 1 Sharing the Factors, page 812		PA 2 Finding the Solution Bingo, page 813		
Progress-Monitoring Activities				
PM 1 Apply Skills 1, page 814	PM 2 Apply Skills 2, page 815	PM 3 Apply Skills 3, page 816	PM 4 Apply Skills 4, page 817	PM 5 Apply Skills 5, page 818
*Problem-Solving Activities				
*PS 1 Paving the Yard, page 819		*PS 2 Finding Dimensions, page 820		
Ongoing Assessment				
Posttest Objective 3, page 821				
Pretest Objective 4, page 822				

CD = Concept Development PM = Progress Monitoring PS = Problem Solving
PA = Practice Activity * = Includes Problem Solving

Objective Goals provide specific examples of the skills and concepts students are expected to learn through the Objective Activities.

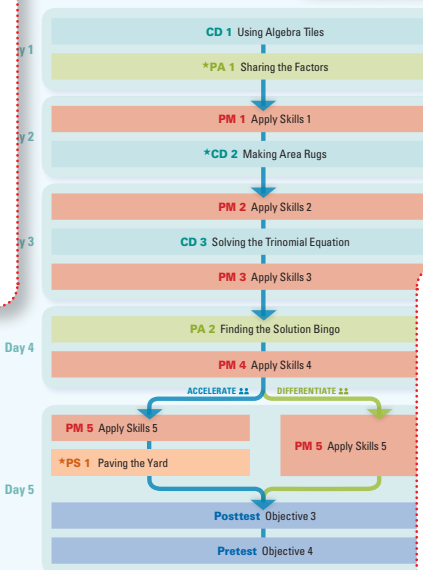
► Planning & Prep: INSTRUCTIONAL PLANS

Using data from the pretest, teachers can choose between two differentiated Instructional Plans to complete the objective: an intensive five-day plan or a streamlined three- or four-day plan. Notice that embedded in each plan is another layer of differentiation to ensure instruction is always suited to the needs of students.



5-Day Instructional Plan

Use the 5-Day Instructional Plan when pretest results indicate that students will learn at a slower pace. This plan is used when the majority of students do not demonstrate mastery on the pretest. This plan does not include an alternate pathway.



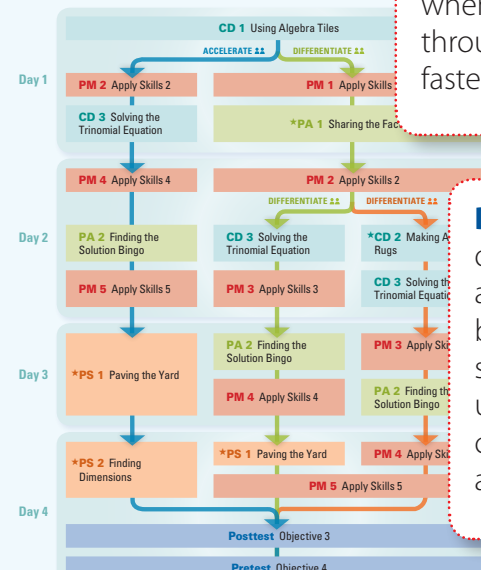
CD = Concept Development PM = Progress Monitoring PS = Problem Solving
PA = Practice Activity * = Includes Problem Solving

Two distinct **Instructional Plans** provide explicit guidance in the selection of appropriate activities for differentiation.

Differentiation occurs through alternate activities based on whether students demonstrate understanding of the concept or need additional support.

4-Day Instructional Plan

Use the 4-Day Instructional Plan when pretest results indicate that students will learn through the activities at a faster pace. This plan is ideal when the majority of students demonstrate mastery on the pretest.



CD = Concept Development PM = Progress Monitoring PS = Problem Solving
PA = Practice Activity * = Includes Problem Solving

When the majority of students **demonstrate mastery** on the Objective Pretest, a streamlined Instructional Plan provides an alternate pathway for when the class can move through the activities at a faster pace.

Differentiation occurs through alternate activities based on whether students demonstrate understanding of the concept or need additional support.

When the majority of students **do not demonstrate mastery** on the Objective Pretest, an **intensified Instructional Plan** provides additional activities.

► Instructional Design: CONCEPT DEVELOPMENT ACTIVITIES

What are Concept Development Activities?

In *Inside Algebra*, these activities are teacher-directed, explicit lessons that provide modeling and guided practice through the use of pictorial representations, hands-on manipulatives, and ExploreLearning *Gizmos*.

Why are Concept Development Activities important?

When learning algebra, many students focus on memorizing the right algorithms to solve math problems instead of the underlying concepts that can be applied to real-world, tangible problems. As algebra instruction increases in complexity, these students consistently struggle because they lack the full knowledge needed to be proficient. In *Inside Algebra's* Conceptual Development Activities, algebra instruction is taken from the abstract to the concrete, and students learn how concepts relate to other concepts and how to apply what they have learned to new skills.

Objective 3
Concept Development Activities

CD 1 Using Algebra Tiles

Use with 5-Day or 4-Day Instructional Plan. In this activity, students factor quadratic trinomials using algebra tiles.

MATERIALS

- Algebra tiles, one set for every two students
- Variation: Gizmos**
Modeling the Factorization of $x^2 + bx + c$

DIRECTIONS

- Review the following term with students:
factor: A monomial that evenly divides a value
- Review how to find the product of two binomials using algebra tiles; for example, write $(x + 1)(x + 2)$ on the board and use the following rectangle to discuss:


$$\begin{array}{c} x + 2 \\ \begin{array}{|c|c|c|} \hline x^2 & x & x \\ \hline x & x & 1 \\ \hline \end{array} \end{array}$$

Be sure students see that $(x + 1)(x + 2) = x^2 + 3x + 2$.
- Discuss the following term with students:
quadratic trinomial: A polynomial of the form $ax^2 + bx + c$
- Next, show students that to find factors of a trinomial, they should make a rectangle out of the given trinomial. In other words, work backward from what is shown in Step 2. Write $x^2 + 4x + 3$ on the board, and use algebra tiles to factor the trinomial. Show students how to determine the dimensions of the overall rectangle. $(x + 1)(x + 3)$

$$\begin{array}{c} x + 3 \\ \begin{array}{|c|c|c|} \hline x^2 & x & x \\ \hline x & 1 & 1 \\ \hline \end{array} \end{array}$$

Variation: Gizmos For this activity, use the tiles in the Gizmo *Modeling the Factorization of $x^2 + bx + c$* to model the factoring of these quadratic expressions.

ExploreLearning • Gizmos



Modeling the Factorization of $x^2 + bx + c$

- Write several polynomials on the board, and have students use algebra tiles to find the factors. Call on students to give you the factors they found and write them under the appropriate polynomials.

Sample problems:

$$\begin{array}{l} x^2 + 5x + 6 \quad (x + 2)(x + 3) \\ x^2 + 4x + 4 \quad (x + 2)^2 \\ x^2 + x - 6 \quad (x - 2)(x + 3) \\ x^2 + 6x + 5 \quad (x + 1)(x + 5) \end{array}$$

- Demonstrate how to factor $x^2 + 5x + 6$. $(x + 2)(x + 3)$ Discuss the relationship between the numbers (5 and 6) and the factors (2 and 3). Make sure students recognize that $2 + 3 = 5$ and $2 \cdot 3 = 6$. Use the model to show why the relationship exists. Repeat this process for all polynomials on the board.
- Ask students to find the factors of $x^2 + 7x + 10$ and $x^2 + x - 12$. Allow students to use the algebra tiles if they need the model to find the factors.
 $x^2 + 7x + 10 = (x + 2)(x + 5)$, $x^2 + x + 12 = (x - 3)(x + 4)$
Note: If students need more practice multiplying binomials, refer to Chapter 8, Objective 5.

NEXT STEPS • Differentiate

5-Day Instructional Plan:
PA 1, page 812—All students, for additional practice and problem solving

4-Day Instructional Plan:
PM 2, page 815—Students who demonstrate understanding of the concept, to assess progress
PM 1, page 814—Students who need additional support, to assess progress

► Instructional Design: CONCEPT DEVELOPMENT ACTIVITIES EXAMPLE

Concept Development Activities use manipulatives to develop algebraic thinking and provide concrete representations of abstract concepts.

Consistent lesson format provides explicit direction for teachers to present instruction to support student mastery.

Objective 3 Concept Development Activities

CD 1 Using Algebra Tiles

Use with 5-Day or 4-Day Instructional Plan. In this activity, students factor quadratic trinomials using algebra tiles.

MATERIALS

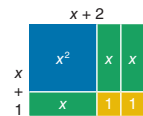
- Algebra tiles, one set for every two students
- Variation: Gizmos**
Modeling the Factorization of $x^2 + bx + c$

DIRECTIONS

- Review the following term with students:

factor: A monomial that evenly divides a value

- Review how to find the product of two binomials using algebra tiles; for example, write $(x + 1)(x + 2)$ on the board and use the following rectangle to discuss:

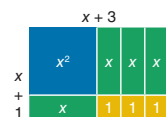


Be sure students see that $(x + 1)(x + 2) = x^2 + 3x + 2$.

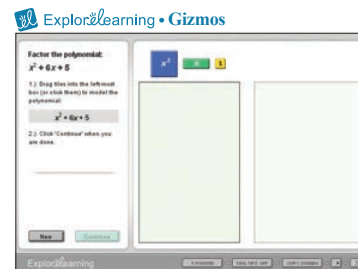
- Discuss the following term with students:

quadratic trinomial: A polynomial of the form $ax^2 + bx + c$

- Next, show students that to find factors of a trinomial, they should make a rectangle out of the given trinomial. In other words, work backward from what is shown in Step 2. Write $x^2 + 4x + 3$ on the board, and use algebra tiles to factor the trinomial. Show students how to determine the dimensions of the overall rectangle. $(x + 1)(x + 3)$



Variation: Gizmos For this activity, use the tiles in the Gizmo *Modeling the Factorization of $x^2 + bx + c$* to model the factoring of these quadratic expressions.



Modeling the Factorization of $x^2 + bx + c$

- Write several polynomials on the board, and have students use algebra tiles to find the factors. Call on students to give you the factors they found and write them under the appropriate polynomials.

Sample problems:

$$x^2 + 5x + 6 \quad (x + 2)(x + 3)$$

$$x^2 + 4x + 4 \quad (x + 2)^2$$

$$x^2 + x - 6 \quad (x - 2)(x + 3)$$

$$x^2 + 6x + 5 \quad (x + 1)(x + 5)$$

- Demonstrate how to factor $x^2 + 5x + 6$. $(x + 2)(x + 3)$ Discuss the relationship between the numbers (5 and 6) and the factors (2 and 3). Make sure students recognize that $2 + 3 = 5$ and $2 \cdot 3 = 6$. Use the model to show why the relationship exists. Repeat this process for all polynomials on the board.

- Ask students to find the factors of $x^2 + 7x + 10$ and $x^2 + x - 12$. Allow students to use the algebra tiles if they need the model to find the factors.

$$x^2 + 7x + 10 = (x + 2)(x + 5), \quad x^2 + x - 12 = (x - 3)(x + 4)$$

Note: If students need more practice multiplying binomials, refer to Chapter 8, Objective 5.

ExploreLearning Gizmos provide alternate presentations of concepts using interactive simulations and virtual manipulatives.

► Instructional Design: PRACTICE ACTIVITIES

What are Practice Activities?

In *Inside Algebra*, the Practice Activities give students time and opportunity to truly master the skills and standards being taught. Students work independently or in small groups on activities that often include games or engaging challenges to motivate students.

Why are Practice Activities important?

To achieve mastery, students must engage in repetitive practice of the skills and standards being taught. While students focus on independent work or interact in small groups, teachers can informally monitor students and provide additional support when needed.

Objective 3 Practice Activities

► PA 1 Sharing the Factors

Use with 5-Day or 4-Day Instructional Plan. In this activity, students factor quadratic trinomials.

DIRECTIONS

- Review the following terms with students:
 - factor** A monomial that evenly divides a value
 - quadratic trinomial** A polynomial of the form $ax^2 + bx + c$
- Write $(x \pm a)$ and $(x \pm b)$, where $-10 \leq a \leq 10$ and $-10 \leq b \leq 10$ on the board. Have the class come up with two binomials in this form. Guide students as they multiply the binomials to get a trinomial, for example, $(x + 4)(x - 7) = x^2 - 3x - 28$.
- Divide the class into groups of four.
- Have each group design three similar problems using the guidelines on the board. Have them write these problems on a piece of paper. On a new sheet of paper, have students write the three trinomials they get by multiplying their binomial pairs.
- Have the groups exchange their trinomials with another group in the class. Make sure students hold onto the matching binomials they wrote. Tell students to work in their groups to factor the three trinomials they received.
- After students finish, have each group pick one problem to put on an overhead transparency and present to the class. Tell groups to show how they found the factors to the problem. This will allow the class to see different ways to find the factors. Students need to find a method they understand and can use.

Variation: Writing Have each student write an explanation of how to factor a trinomial, such as $x^2 + x - 6$. Review the written explanations.
- Repeat Steps 4–6 using two binomials of the form $(ax \pm b)$ and $(x \pm c)$. In this case, students practice factoring trinomials with a coefficient for the x^2 term.

* = Includes Problem Solving

812 Chapter 9 • Objective 3

NEXT STEPS • Differentiate

5-Day Instructional Plan:

PM 1, page 814—All students, to assess progress

4-Day Instructional Plan:

PM 2, page 815—All students, to assess progress

Objective 3 Practice Activities

► PA 2 Finding the Solution Bingo

Use with 5-Day or 4-Day Instructional Plan. In this activity, students factor quadratic trinomials.

MATERIALS

- Blackline Master 38
- Game markers to cover squares

DIRECTIONS

- Review the following terms with students:
 - factor** A monomial that evenly divides a value
 - quadratic trinomial** A polynomial of the form $ax^2 + bx + c$
- Distribute one copy of Blackline Master 38, 4 × 4 Bingo Card, to each student. Have each student put the numbers $-3, -2, -1, 0, 1, 2, 3$ at random in the squares of the bingo card. Point out that they will have to repeat some numbers to fill the 16 squares.
- Write an equation on the board, selected at random from the list below. Tell students to solve the equation and cover the squares that have the solution(s) with their markers. Have students write the equations and solutions on a piece of paper to hand in at the end of the activity.

Equations to Use	Solutions	Equations to Use	Solutions
1. $x^2 + 3x + 2 = 0$	-2, -1	14. $x^2 - 2x - 3 = 0$	-1, 3
2. $x^2 - 4x + 3 = 0$	3, 1	15. $x^2 - x - 2 = 0$	2, -1
3. $x^2 - 4x + 4 = 0$	2	16. $x^2 - 5x + 6 = 0$	3, 2
4. $x^2 + x - 6 = 0$	-3, 2	17. $x^2 + 2x - 3 = 0$	-3, 1
5. $x^2 + x - 2 = 0$	-2, 1	18. $x^2 + 4x + 3 = 0$	-3, -1
6. $x^2 + 2x + 1 = 0$	-1	19. $x^2 + 5x + 6 = 0$	-3, -2
7. $x^2 + 6x + 9 = 0$	-3	20. $x^2 + 2x = 0$	-2, 0
8. $x^2 - x - 6 = 0$	3, -2	21. $x^2 - 4 = 0$	-2, 2
9. $x^2 - 2x = 0$	0, 2	22. $x^2 + 3x = 0$	0, -3
10. $x^2 + 4x + 4 = 0$	-2	23. $x^2 - 2x + 1 = 0$	1
11. $x^2 + x = 0$	0, -1	24. $x^2 - 3x + 2 = 0$	1, 2
12. $x^2 - 6x + 9 = 0$	3	25. $x^2 - 4x + 4 = 0$	2
13. $x^2 - 3x = 0$	0, 3		
- Continue with other equations. The first student to get four markers in a row should call out, "Bingo!" If the student's answers are correct, that student is the winner.
- Alternatively, continue play until a student covers all the squares on his or her card.

Name _____ Date _____

38

4 × 4 BINGO CARD

NEXT STEPS • Differentiate

5-Day Instructional Plan:

PM 4, page 817—All students, to assess progress

4-Day Instructional Plan:

PM 5, page 818—Students who are on the accelerated path, to assess progress

PM 4, page 817—Students who are on the differentiated path, to assess progress

► Instructional Design: PRACTICE ACTIVITIES EXAMPLE

Practice Activities use games and small-group interaction to strengthen conceptual understanding.

Important **vocabulary** is highlighted and reviewed at point of use to promote math language development.

Objective 3 Practice Activities

PA 2 Finding the Solution Bingo

Use with 5-Day or 4-Day Instructional Plan. In this activity, students factor quadratic trinomials.

MATERIALS

- Blackline Master 38
- Game markers to cover squares

DIRECTIONS

1. Review the following terms with students:

factor A monomial that evenly divides a value
quadratic trinomial A polynomial of the form $ax^2 + bx + c$

2. Distribute one copy of Blackline Master 38, 4 × 4 Bingo Card, to each student. Have each student put the numbers **-3, -2, -1, 0, 1, 2, 3** at random in the squares of the bingo card. Point out that they will have to repeat some numbers to fill the 16 squares.
3. Write an equation on the board, selected at random from the list below. Tell students to solve the equation and cover the squares that have the solution(s) with their markers. Have students write the equations and solutions on a piece of paper to hand in at the end of the activity.

Equations to Use	Solutions	Equations to Use	Solutions
1. $x^2 + 3x + 2 = 0$	-2, -1	14. $x^2 - 2x - 3 = 0$	-1, 3
2. $x^2 - 4x + 3 = 0$	3, 1	15. $x^2 - x - 2 = 0$	2, -1
3. $x^2 - 4x + 4 = 0$	2	16. $x^2 - 5x + 6 = 0$	3, 2
4. $x^2 + x - 6 = 0$	-3, 2	17. $x^2 + 2x - 3 = 0$	-3, 1
5. $x^2 + x - 2 = 0$	-2, 1	18. $x^2 + 4x + 3 = 0$	-3, -1
6. $x^2 + 2x + 1 = 0$	-1	19. $x^2 + 5x + 6 = 0$	-3, -2
7. $x^2 + 6x + 9 = 0$	-3	20. $x^2 + 2x = 0$	-2, 0
8. $x^2 - x - 6 = 0$	3, -2	21. $x^2 - 4 = 0$	-2, 2
9. $x^2 - 2x = 0$	0, 2	22. $x^2 + 3x = 0$	0, -3
10. $x^2 + 4x + 4 = 0$	-2	23. $x^2 - 2x + 1 = 0$	1
11. $x^2 + x = 0$	0, -1	24. $x^2 - 3x + 2 = 0$	1, 2
12. $x^2 - 6x + 9 = 0$	3	25. $x^2 - 4x + 4 = 0$	2
13. $x^2 - 3x = 0$	0, 3		

Name _____ Date _____ 38

4 × 4 BINGO CARD

4. Continue with other equations. The first student to get four markers in a row should call out, "Bingo!" If the student's answers are correct, that student is the winner.
5. Alternatively, continue play until a student covers all the squares on his or her card.

NEXT STEPS • Differentiate

5-Day Instructional Plan:

PM 4, page 817—All students, to assess progress

4-Day Instructional Plan:

PM 5, page 818—Students who are on the accelerated path, to assess progress

PM 4, page 817—Students who are on the differentiated path, to assess progress

Next Steps provide guidance based on student performance along the instructional path.

► Instructional Design: PROGRESS-MONITORING ACTIVITIES

What are Progress-Monitoring Activities?

In *Inside Algebra*, the Progress Monitoring activities assess computational fluency of the skills and standards being taught.

Why are the Progress Monitoring Activities important?

The foundation of *Inside Algebra's* instruction is based on differentiation and the additional support students need to achieve mastery. Frequent, informal progress-monitoring opportunities provide the data to drive these instructional decisions and identify students in need of support.

Note for Teacher:

In the Teacher Guide, common computational errors are listed with recommendations about immediate corrective feedback for the student.

Objective 3 Progress-Monitoring Activities
PM 1 Apply Skills 1

Use with 5-Day or 4-Day Instructional Plan.

MATERIALS

- Interactive Text, page 346

DIRECTIONS

- Have students turn to *Interactive Text*, page 346, Apply Skills 1.
- Remind students of the key terms *quadratic trinomial* and *factor*.
- Monitor student work, and provide feedback as necessary.

Watch for:

- Do students factor the trinomials to complete the rectangles?
- Do any students try an algebraic method?

NEXT STEPS • Differentiate

5-Day Instructional Plan:
CD 2, page 810—All students, concept development and problem solving

4-Day Instructional Plan:
PA 1, page 812—All students, practice and problem solving

Objective 3 Progress-Monitoring Activities
PM 2 Apply Skills 2

Use with 5-Day or 4-Day Instructional Plan.

MATERIALS

- Interactive Text, page 347

DIRECTIONS

- Have students turn to *Interactive Text*, page 347, Apply Skills 2.
- Remind students of the key terms: *quadratic trinomial* and *factor*.
- Monitor student work, and provide feedback as necessary.

Watch for:

- Do students factor the trinomials using area rugs?
- Do students check their answers by multiplying the resulting binomials?

NEXT STEPS • Differentiate

5-Day Instructional Plan:
CD 3, page 811—All students, for additional concept development

3-Day Instructional Plan:
CD 3, page 811—Students who are on the accelerated path, for additional concept development
CD 3, page 811—Students on the differentiated path who demonstrate understanding of the concept, to extend understanding
CD 2, page 810—All other students, for additional concept development

► Instructional Design: PROGRESS-MONITORING ACTIVITIES EXAMPLE

Progress-Monitoring Activities determine differentiation through alternate activities as they build fluency with basic algebra skills.

Informal assessment strategies such as **ask for, watch for, and listen for** provide further insight into student progress.

Objective 3 Progress-Monitoring Activities

PM 1 Apply Skills 1

Use with 5-Day or 4-Day Instructional Plan.

MATERIALS

- *Interactive Text*, page 346

DIRECTIONS

1. Have students turn to *Interactive Text*, page 346, Apply Skills 1.
2. Remind students of the key terms: *quadratic trinomial* and *factor*.
3. Monitor student work, and provide feedback as necessary.

Watch for:

- Do students factor the trinomials using algebra tiles to complete the rectangle?
- Do any students try an algebraic method?

NEXT STEPS • Differentiate

5-Day Instructional Plan:

CD 2, page 810—All students, for additional concept development and problem solving

4-Day Instructional Plan:

PA 1, page 812—All students, for additional practice and problem solving

PROGRESS MONITORING

Name _____ Date _____

APPLY SKILLS 1

Factor each of the quadratic trinomials.

Example:
 $x^2 + 6x + 8 = (x + 2)(x + 4)$

1. $x^2 + 8x + 20 = (x + 4)(x + 5)$
2. $x^2 + 12x + 20 = (x + 2)(x + 10)$
3. $x^2 - 4x - 32 = (x + 4)(x - 8)$
4. $x^2 + 4x + 3 = (x + 1)(x + 3)$
5. $x^2 + x - 6 = (x - 2)(x + 3)$
6. $x^2 + 8x + 12 = (x + 2)(x + 6)$
7. $x^2 + 6x + 5 = (x + 1)(x + 5)$
8. $x^2 + x - 2 = (x - 1)(x + 2)$
9. $x^2 - 6x + 8 = (x - 2)(x - 4)$
10. $x^2 - 3x - 18 = (x + 3)(x - 6)$
11. $x^2 - 4x + 3 = (x - 1)(x - 3)$
12. $x^2 + 10x + 21 = (x + 3)(x + 7)$
13. $x^2 + x - 12 = (x - 3)(x + 4)$
14. $x^2 - 7x + 12 = (x - 3)(x - 4)$
15. $x^2 + 9x + 10 = (x + 10)(x - 1)$
16. $x^2 - 12x + 32 = (x - 4)(x - 8)$
17. $x^2 + x - 30 = (x + 5)(x - 6)$
18. $x^2 - 8x - 9 = (x + 1)(x - 9)$
19. $2x^2 + 11x + 12 = (2x + 3)(x + 4)$
20. $3x^2 + 16x + 5 = (3x + 1)(x + 5)$

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Modified wraparound Teacher Guide includes **answer keys**.

► Instructional Design: PROBLEM-SOLVING ACTIVITIES

What are Problem-Solving Activities?

In *Inside Algebra*, Problem-Solving Activities are multistep math problems related to the objective and taught in a teacher-led, independent, or cooperative setting. These multistep activities provide the structure and time students need to think through and fully understand the concepts and skills being taught.

Why are Problem-Solving Activities important?

Instructionally, these activities accomplish two distinct goals related to student mastery. In the teacher-led setting, students are introduced to new skills with explicit, step-by-step guidance about how to solve problems. As instruction increases in complexity, students are expected to apply and justify their reasoning skills to problems to demonstrate and explain their understanding and proficiency.

Note for Teacher:

In many activities, teachers use open-ended and short-response prompts that require students to write about their work and demonstrate their fluency in mathematical language.

**Objective 3
Problem-Solving
Activities**

*** PS 1 Paving the Yard**

**Objective 3
Problem-Solving
Activities**

*** PS 2 Finding Dimensions**

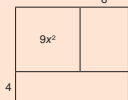
**Objective 3
Problem-Solving
Activities**

Use with 5-Day or 4-Day Instructional Plan. In this activity, students calculate the area of a rectangle.

DIRECTIONS

- Read the following scenario to students:

A homeowner wants to pave a square area in his backyard that is $9x^2$ square feet in area. He will use square pavers that measure one foot on each side. He is considering extending the paving rectangular areas adjacent to the original. The first rectangular area is to the east 6 feet long and as wide as the original. The second rectangular area is to the south 4 feet wide and as long as his original plus the 6-foot extension.



- Tell students to write an expression in terms of x that would indicate how many pavers the homeowner would need. $(3x + 6)(3x + 4)$
- Ask students to think about how large the original square area is that the homeowner wanted to pave if $x = 3$. **81 square feet** Make sure students recognize that the homeowner would need 81 pavers for the original square area if $x = 3$ because he uses pavers that are one square foot.
- Ask students to determine how many more pavers

Use with 4-Day Instructional Plan. In this activity, students apply what they know about quadratic equations to solve word problems.

DIRECTIONS

- Discuss the following term with students:
quadratic formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ where $ax^2 + bx + c = 0$
- Read the following scenario to students:

A small calf needs to be kept away from the herd of cattle because of an infection. The rancher has fences made of tubing that can be put up quickly. The calf will need 280 square feet of grazing land. The tube frame will be six feet longer than it is wide. Find the dimensions of the fence.


- Guide students as they write an equation based on the information they know. Remind students to solve the equation to find the actual dimensions of the area.

$$x(x + 6) = 280 \text{ sq. ft.}$$

$$x^2 + 6x = 280$$

$$x^2 + 6x - 280 = 0$$

$$(x - 14)(x + 20) = 0$$

$$x = 14, -20; \text{ dimensions cannot be negative so the fence is 14 ft. by 20 ft.}$$
- Tell students to find the dimensions if the calf only needs 160 square feet of grazing land.

$$x(x + 6) = 160 \text{ sq. ft.}$$

$$x^2 + 6x = 160$$

$$x^2 + 6x - 160 = 0$$

$$(x - 10)(x + 16) = 0$$


$$x = 10, -16; \text{ dimensions cannot be negative so the fence is 10 ft. by 16 ft.}$$

Use with 4-Day Instructional Plan. In this activity, students apply what they know about quadratic equations to solve word problems.

DIRECTIONS

- Discuss the following term with students:
quadratic formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ where $ax^2 + bx + c = 0$
- Read the following scenario to students:

A rectangular garden (16 feet by 21 feet) has a uniform rock path around it. If the total area of the garden and path is 500 square feet, what is the width of the path?



Total area = 500 square feet

21 ft.

16 ft.
- Guide students as they write an equation based on the information they know. Remind students to solve the equation to find the actual dimensions of the area.

$$l \cdot w = 500 \text{ sq. ft.}$$

$$(21 + x + x)(16 + x + x) = 500$$

$$(21 + 2x)(16 + 2x) = 500$$

$$4x^2 + 74x + 336 = 500$$

$$4x^2 + 74x - 164 = 0$$

$$2x^2 + 37x - 82 = 0$$

$$(2x + 41)(x - 2) = 0$$

$$x = -\frac{41}{2} \text{ or } 2; \text{ measurement must be positive so the width of the path is 2 ft.}$$

NEXT STEPS • Differentiate
4-Day Instructional Plan:
Objective 3 Posttest, page 821—All students

* = Includes Problem Solving

► Instructional Design: PROBLEM-SOLVING ACTIVITIES EXAMPLE

Problem-Solving Activities reinforce problem-solving strategies and reflective thinking as students synthesize cumulative skills.

Objective 3 Problem-Solving Activities

*PS 2 Finding Dimensions

Use with 4-Day Instructional Plan. In this activity, students apply what they know about quadratic equations to solve word problems.

DIRECTIONS

1. Discuss the following term with students:

quadratic formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ where $ax^2 + bx + c = 0$

2. Read the following scenario to students:

A small calf needs to be kept away from the herd of cattle because of an infection. The rancher has fences made of tubing that can be put up quickly. The calf will need 280 square feet of grazing land. The tube frame will be six feet longer than it is wide. Find the dimensions of the fence.

280
square feet

3. Guide students as they write an equation based on the information they know. Remind students to solve the equation to find the actual dimensions of the area.

$x(x + 6) = 280$ sq. ft.
 $x^2 + 6x = 280$
 $x^2 + 6x - 280 = 0$
 $(x - 14)(x + 20) = 0$
 $x = 14, -20$; dimensions cannot be negative so the fence is 14 ft. by 20 ft.

4. Tell students to find the dimensions if the calf only needs 160 square feet of grazing land.

$x(x + 6) = 160$ sq. ft.
 $x^2 + 6x = 160$
 $x^2 + 6x - 160 = 0$
 $(x - 10)(x + 16) = 0$
 $x = 10, -16$; dimensions cannot be negative so the fence is 10 ft. by 16 ft.

* = Includes Problem Solving

5. Read the following scenario to students:

A rectangular garden (16 feet by 21 feet) has a uniform rock path around it. If the total area of the garden and path is 500 square feet, what is the width of the path?

Total area =
500 square feet

21 ft.
16 ft.

6. Guide students as they write an equation based on the information they know. Remind students to solve the equation to find the actual dimensions of the area.

$l \cdot w = 500$ sq. ft.
 $(21 + x + x)(16 + x + x) = 500$
 $(21 + 2x)(16 + 2x) = 500$
 $4x^2 + 74x + 336 = 500$
 $4x^2 + 74x - 164 = 0$
 $2x^2 + 37x - 82 = 0$
 $(2x + 41)(x - 2) = 0$
 $x = -\frac{41}{2}$ or 2; measurement must be positive so the width of the path is 2 ft.

NEXT STEPS • Differentiate

4-Day Instructional Plan:

Objective 3 Posttest, page 821—All students

Examples of student solutions showcase one possible strategy students may use to solve the problem.

► Instructional Design: OBJECTIVE POSTTEST

The Objective Posttest quickly assesses a student's mastery of the objective and provides data for teachers to make decisions on the need for differentiation.

Each **Objective Posttest** measures student growth in mastering the objective and identifies concepts that may need reinforcement.

9 CHAPTER

Objective 3 Ongoing Assessment

Objective 3 Posttest

Discuss with students the key concepts in Objective 3. Following the discussion, administer the Objective 3 Posttest to all students.

Using the Results

- Score the posttest and update the class record card.
- Provide reinforcement for students who do not demonstrate mastery of the concepts through individual or small-group reteaching of key concepts.

Name	Date
Factor the quadratic polynomials.	
1. $x^2 + 7x + 6$ $(x + 1)(x + 6)$	2. $x^2 + 2x - 35$ $(x - 5)(x + 7)$
3. $x^2 - 6x - 27$ $(x + 3)(x - 9)$	4. $3x^2 - 19x - 14$ $(3x + 2)(x - 7)$
5. $4x^2 + 7x - 2$ $(4x - 1)(x + 2)$	
Solve the quadratic equations by factoring.	
6. $x^2 + 2x - 10 = 0$ $(x + 5)(x - 2) = 0$ $x = -5, 2$	7. $x^2 + 2x - 28 = 0$ $(x + 7)(x - 4) = 0$ $x = -7, 4$
8. $x^2 + x - 30 = 0$ $(x + 6)(x - 5) = 0$ $x = -6, 5$	9. $2x^2 - 3x - 14 = 0$ $(x + 2)(2x - 7) = 0$ $x = -2, \frac{7}{2}$
10. $3x^2 + 14x + 8 = 0$ $(x + 4)(3x + 2) = 0$ $x = -4, -\frac{2}{3}$	

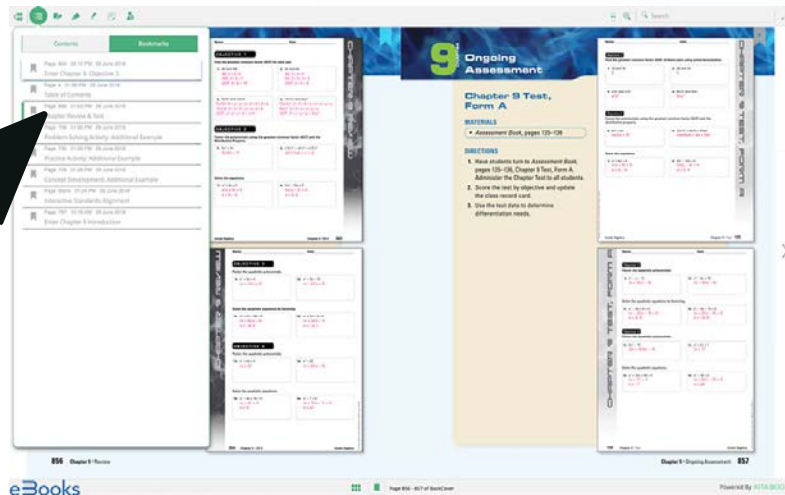
CHAPTER 9
POSTTEST

Inside Algebra Chapter 9 • Objective 3 129

► Instructional Design: CHAPTER REVIEW

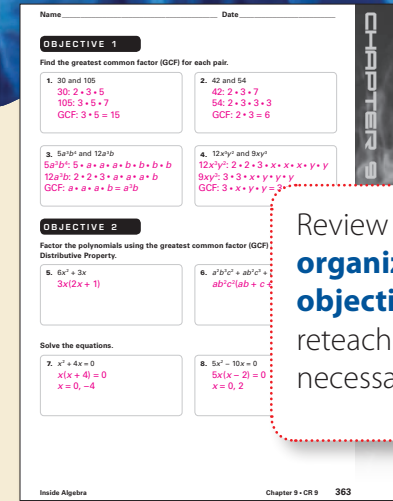
At the end of each chapter, teachers can revisit the instruction, reinforce what was learned, and re-evaluate the need for additional differentiation.

1. **Click** the Contents icon in the toolbar on top.
Click Bookmarks.
Click Enter Chapter Review & Test.

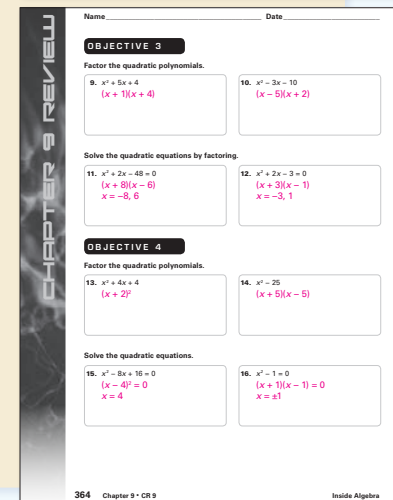


The **Chapter Review** consolidates key concepts to reinforce objectives and provides the opportunity to monitor student learning.

2. Have students turn to *Interactive Text*, pages 363–364, Chapter 9 Review.
2. Have students complete the review individually or in small groups. If the activity is completed individually, provide time for students to discuss their solutions as a class or in small groups.
3. Monitor student work, and provide feedback when necessary. If students complete the review quickly, pair them with other students or groups to discuss their answers.



Review problems **organized by objective** facilitate reteaching when necessary.



► Instructional Design: CHAPTER TEST

This Chapter Test provides student-mastery data that determines what type of differentiation students need to continue: extension activity, student-centered reinforcement, or teacher-led reinforcement.

9

CHAPTER
Ongoing
Assessment

Name _____ Date _____

Objective 1
Find the greatest common factor (GCF) of these pairs using prime factorization.

1. 12 and 18 6	2. 36 and 32 4
3. a^2b and a^3b^2 a^2b^2	4. $6x^2y^3$ and $9xy^2$ $3xy^2$

Objective 2
Factor the polynomials using the greatest common factor (GCF) and the distributive property.

5. $6x^2 + 9x$ $3x(2x + 3)$	6. $12a^2b^2 + 8a^2b + 10ab^2$ $2ab(6ab + 4a + 5b)$
--	--

Solve the equations.

7. $x^2 + 6x + 0 = 0$ $x(x + 6) = 0$ $x = 0, -6$	8. $3a^2 - 12a = 0$ $3a(a - 4) = 0$ $a = 0, 4$
--	--

Inside Algebra

CHAPTER 9 TEST, FORM A

Name _____ Date _____

Objective 3
Factor the quadratic polynomials.

9. $x^2 - x - 12$ $(x + 3)(x - 4)$	10. $x^2 - 8x + 12$ $(x - 3)(x - 4)$
---	---

Solve the quadratic equations by factoring.

11. $x^2 - 6x + 8 = 0$ $(x - 2)(x - 4) = 0$ $x = 2, 4$	12. $x^2 - 4x - 12 = 0$ $(x + 2)(x - 6) = 0$ $x = -2, 6$
--	--

Objective 4
Factor the quadratic polynomials.

13. $9x^2 - 16$ $(3x + 4)(3x - 4)$	14. $x^2 + 2x + 1$ $(x + 1)^2$
---	---

Solve the quadratic equations.

15. $x^2 + 18x + 49 = 0$ $(x + 7)^2 = 0$ $x = -7$	16. $x^2 - 36 = 0$ $(x + 6)(x - 6) = 0$ $x = \pm 6$
---	---

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The **Chapter Test** measures student mastery of skills taught in the chapter and forms the basis for differentiation using the Extension or Reinforcement Activities.

► Instructional Design: EXTENSION ACTIVITY

For students showing mastery, Extension Activity uses ExploreLearning *Gizmos* to represent real-life applications that engage and extend student knowledge of chapter objectives.

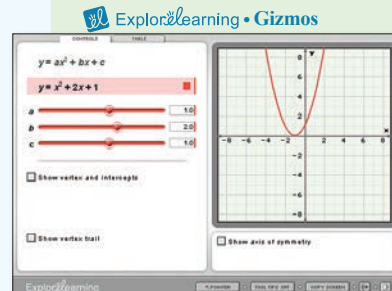
The Extension Activity uses an ExploreLearning *Gizmo*, a fun and easy-to-use **interactive simulation** that supports many different learning styles.

CHAPTER 9 Ongoing Assessment

Students who demonstrated mastery on every objective posttest and scored 80% or above on the chapter test

1. Divide students into pairs or allow them to work individually for this activity.
2. Distribute one copy of the Extension Activity from the online resources to each student.
3. Direct students to the Gizmo *Quadratics in Polynomial Form—Activity A* through the Inside Algebra Student Web site, <http://insidealgebra.voyagerlearning.com>.
4. Have students complete the Extension Activity.
5. **Peer Review.** If there is time, have students exchange papers with a peer. They should review and discuss each response and be prepared to explain their thinking.

Variation: If students do not have access to the Gizmo, provide them with graphs of the functions in Problems 1–4.




Quadratics in Polynomial Form—Activity A

Gizmos Extension Activity Name _____ Date _____

QUADRATICS IN POLYNOMIAL FORM—ACTIVITY A

Cassie is designing a large circular fountain. The distance from the center of the fountain to the edge is 8 feet. Water will come from many jets placed in the fountain. The path of the water from the jet back into the fountain can be modeled by a quadratic polynomial. The graph of a quadratic polynomial is called a parabola.



1. The path of the water from one of the jets can be modeled by the quadratic function $y = -4x^2 + 8x$, where x is the distance in feet from the center of the fountain and y is the height of the water in feet. Solve the equation $0 = -4x^2 + 8x$. $x = 0, 2$
Start the *Quadratics in Polynomial Form—Activity A* Gizmo. Use the sliders to graph the function $y = -4x^2 + 8x$. What are the x -values where the graph crosses the x -axis? $x = 0, 2$
These are the x -intercepts of the graph. What is the y -value that corresponds to an x -intercept? 0 Sketch a graph of the function on the grid.
How can you find the x -intercepts by using the function without looking at the graph?
Replace y with 0 and solve for x .
2. The water leaves the jet in Problem 1 at (0, 0). This means that of the fountain.
At what point on the graph does the water return to the fountain? (2, 0)
How many feet from the center does the water return to the fountain? 2
Does the water stay inside the fountain? YES How do you know?
The distance from the center to the edge is 8 feet

The **Extension Activity** engages students who demonstrated mastery of all objectives and scored 80 percent or above on the Chapter Test. Students work individually or in pairs to complete the activity.

Gizmos Extension Activity Name _____ Date _____

QUADRATICS IN POLYNOMIAL FORM—ACTIVITY A

3. The path from another jet can be modeled by $y = -2x^2 + 8x - 6$. Use factoring to solve the equation $0 = -2x^2 + 8x - 6$. $x = 1, 3$
According to this function and the x -intercepts, describe where the jet could be placed in relation to the center of the fountain.
The jet could either be 1 foot or 3 feet from the center.
Where will the water return to the fountain? The water will return either 1 foot or 3 feet from the center.
Does the water stay inside the fountain? yes
How do you know? The distance is 1 foot or 3 feet, which is less than 8 feet.
Use the Gizmo to graph $y = -2x^2 + 8x - 6$ to verify your answer. Sketch a graph on the grid.
4. The path from another jet can be modeled by $y = -0.5x^2 + 4x - 7.5$. Use factoring to solve $0 = -0.5x^2 + 4x - 7.5$. $x = 3, 5$ Hint: The number -0.5 is a common factor of each term.
According to this function and the x -intercepts, describe where the jet could be placed in relation to the center of the fountain.
The jet could either be 3 feet or 5 feet from the center.
Where will the water return to the fountain?
The water will return either 3 feet or 5 feet from the center.
Does the water stay inside the fountain? yes
Use the Gizmo to graph the function. Sketch a graph on the grid.
5. Each quadratic function is in the form $y = ax^2 + bx + c$. Look at the value of a in each function.
What do these values have in common? They are all negative.
What do the shapes of the graphs have in common? They all open downward.
How do you think the value of a affects the graph?
Answers will vary, but students should recognize that when $|a| < 1$, the graph is wider and when $|a| > 1$, the graph is narrower.

Inside Algebra • Chapter 9 • Extension 2

► Instructional Design: STUDENT-CENTERED REINFORCEMENT ACTIVITY

For students close to mastery, the Student-Centered Reinforcement Activity scaffolds instruction and promotes small-group collaboration and discussion.

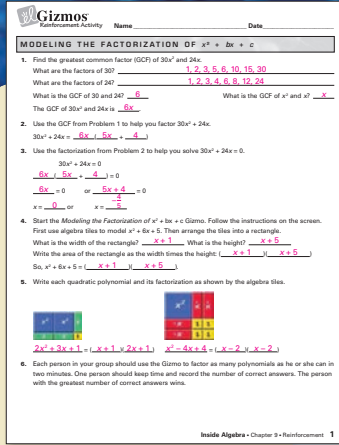

9 CHAPTER
Ongoing Assessment

Students who demonstrated mastery on every objective posttest but scored below 80% on the chapter test

1. Divide students into pairs or small groups.
2. Distribute one copy of the Individual Reinforcement Activity from the online resources to each student.
3. Direct students to the Gizmo *Modeling the Factorization of $x^2 + bx + c$* through the Inside Algebra Student Web site, <http://insidealgebra.voyagerlearning.com>.
4. Have students complete the Reinforcement Activity.
5. **Peer Review.** If time permits, have students exchange papers with a peer to review and discuss each other's responses. Remind students to be prepared to explain the reasoning behind their responses.

Variation:

If students do not have access to the Gizmo, provide them with algebra tiles to use to model and factor the polynomial in Problem 4. For Problem 6, provide students with a list of quadratic polynomials to factor.

Modeling the Factorization of $x^2 + bx + c$

Peer Review promotes discussion among students. They use math vocabulary to explain their thinking which is a key factor in solidifying concepts.

The Student-Centered Reinforcement Activity uses ExploreLearning *Gizmos* to strengthen understanding of chapter objectives for students who demonstrated mastery of all objectives and scored **below 80 percent but at or above 60 percent**. Students work in pairs or in small groups to complete the activity.

► Instructional Design: TEACHER-LED REINFORCEMENT ACTIVITY

For students who struggle to master all objectives, the Teacher-Led Reinforcement Activity provides a more intensive differentiation lesson in a small group or one on one.

The Teacher-Led Reinforcement Activity uses ExploreLearning *Gizmos* and accompanying teacher directions to reteach key objectives for students who **did not demonstrate mastery of any or all objectives.**



Students who did not demonstrate mastery on any or all of the objective posttests or the chapter test

Note: The Gizmo is not needed to answer Problems 1–3, 5, and 6.

- Ask students to find the greatest common factor (GCF) of $30x^2$ and $24x$.
 - Ask students to name the factors of 30 and 24. 30: 1, 2, 3, 5, 6, 10, 15, 30; 24: 1, 2, 3, 4, 6, 8, 12, 24 Ask for the common factors. 1, 2, 3, 6 Ask for the greatest common factor. 6
 - Ask students to name the greatest common factor of x^2 and x . x
 - Ask students to name the GCF of $30x^2$ and $24x$. $6x$
- Ask students to factor $30x^2 + 24x$. Have students use their answer to Problem 1.
 - Ask students what $6x$ is multiplied by to get $30x^2$. $5x$ Ask students what $6x$ is multiplied by to get $24x$. 4
 - Ask students to use the Distributive Property and state the factored expression. $30x^2 + 24x = 6x(5x + 4)$
- Ask students to solve $30x^2 + 24x = 0$. Use the answer to Problem 2. Remind students of the Zero Product Property.
 - Ask students what two equations they need to solve the problem. $6x = 0$ and $5x + 4 = 0$
 - Ask students to solve the equations. $x = 0$ and $x = -\frac{4}{5}$
- Start the *Modeling the Factorization of $x^2 + bx + c$* Gizmo.
 - Ask students to name the tiles needed to model $x^2 + 6x + 5$. Drag tiles into the left box as they answer. one x^2 tile, six x tiles, five unit tiles

- Ask students to help you arrange the tiles into a rectangle to factor the expression. As you drag tiles into the right box, point out the width and height written along the top and left sides of the box.
 - After the rectangle is formed, ask students for the factors. $(x + 5)$ and $(x + 1)$
- Arrange algebra tiles into a rectangle to show $2x^2 + 3x + 1 = (x + 1)(2x + 1)$. First ask students to name the expression shown by the tiles. $2x^2 + 3x + 1$ Next, ask them to name factors given by the length and width of the rectangle. $(x + 1)$ and $(2x + 1)$
 - Repeat the process in Problem 5 with $x^2 - 4x + 4 = (x - 2)(x - 2)$.

Variation: If students do not have access to the Gizmo, use a blackboard or overhead projector and algebra tiles to complete the activity.



Modeling the Factorization of $x^2 + bx + c$

The **Variation** describes how to complete the differentiation activities if the teacher or the students cannot access ExploreLearning *Gizmos*.

Assessments & Reports

The comprehensive *Inside Algebra* assessment system allows teachers to accurately measure student progress and proficiency at every stage of instruction. With a variety of reports available, teachers and administrators have actionable data that can be used to drive instructional decisions, communicate progress to parents, and ensure students meet their goals.

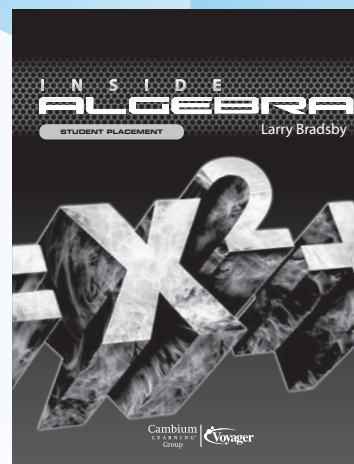
Take a look at each assessment that students, reports teachers can generate, and the overall purpose of monitoring.

► Placement Test

Before instruction begins, the Placement Test is administered to all *Inside Algebra* students. Based on results, a recommendation is made for student placement into one of two entry points:

Chapter 1 is appropriate for students with significant gaps in pre-algebraic skills and standards.

Chapter 3 is appropriate for students with the basic knowledge needed to begin mastering algebra skills and standards.

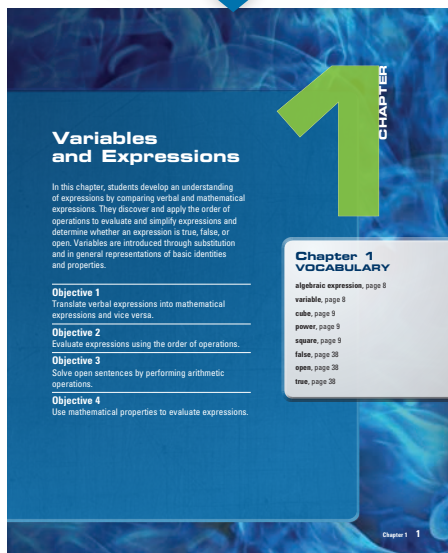


ENTRY POINT 1

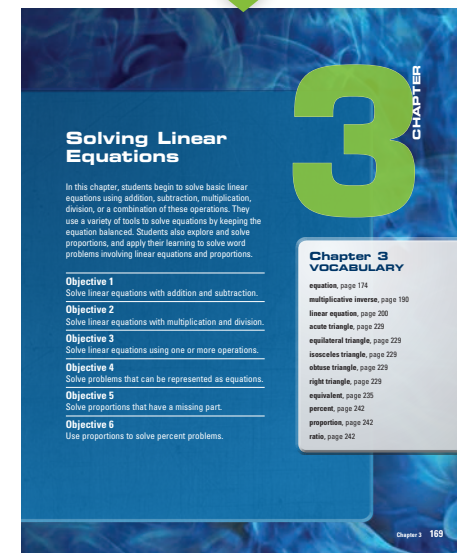
ENTRY POINT 2

Chapter 1: Variables and Expressions

Chapter 3: Solving Linear Equations



Teacher Guide, Chapter 1 Opener



Teacher Guide, Chapter 3 Opener

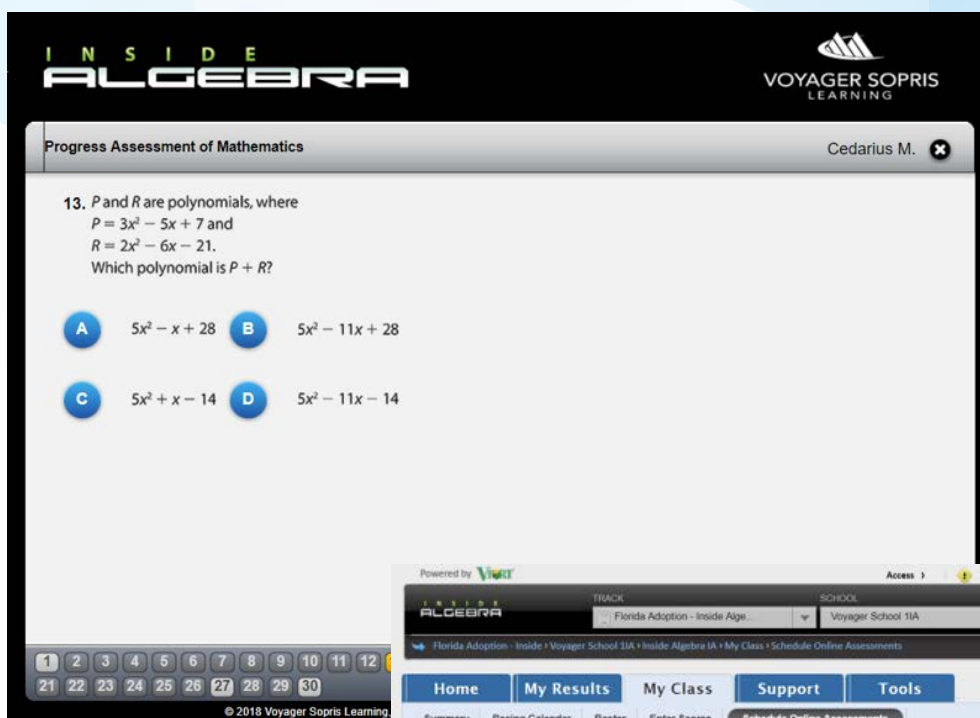
► Progress Assessment of Mathematics (PAM)

What is the Progress Assessment of Mathematics (PAM)?

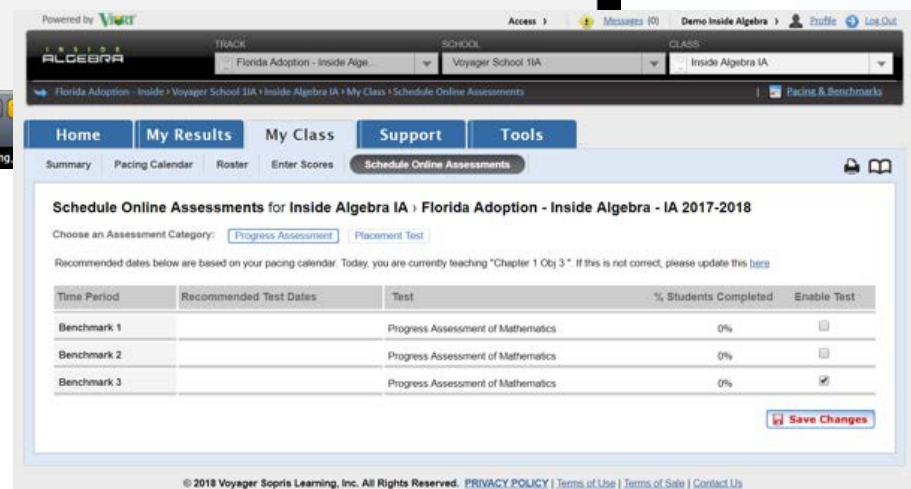
Inside Algebra utilizes the PAM powered by The Quantile Framework® for Mathematics as a benchmark assessment that can be administered online or by paper/pencil three times a year. Reports are automatically available when assigned/administered online.

Why is the PAM important?

Like Lexiles in reading, the PAM assessment assigns students a Quantile score that represents a student's range of skills and readiness for learning new skills. As a benchmark assessment, the PAM is used to determine student mastery and document their trajectory toward grade-level standards proficiency.



PAM Assessment Online



Assessment Assignments in the Teacher Center

► Ongoing Assessments

As discussed in the Instructional Design section, several ongoing assessments are embedded in daily instruction and used to drive instructional decisions and differentiate with effectiveness. These ongoing assessments include:

- Pretest/Posttests
- Progress-Monitoring Activities
- End-of-Chapter Tests
- Informal Assessments

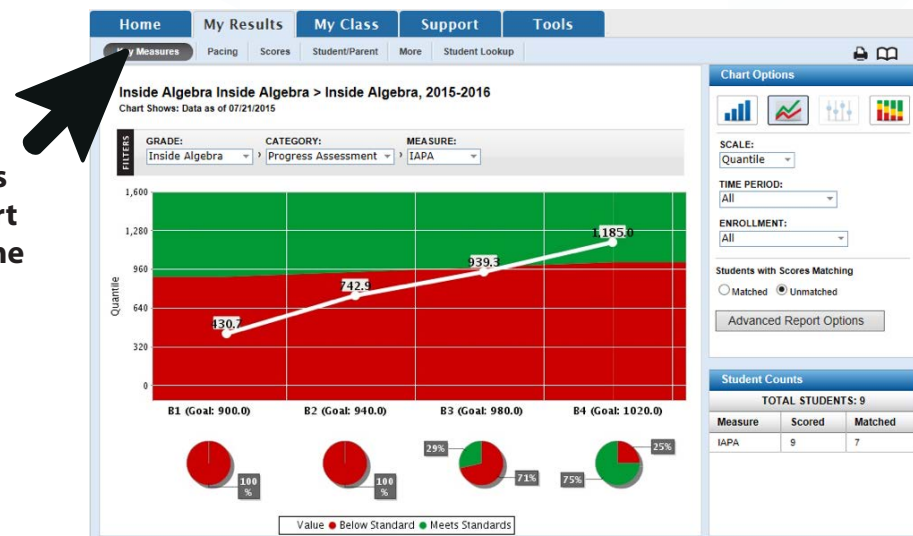
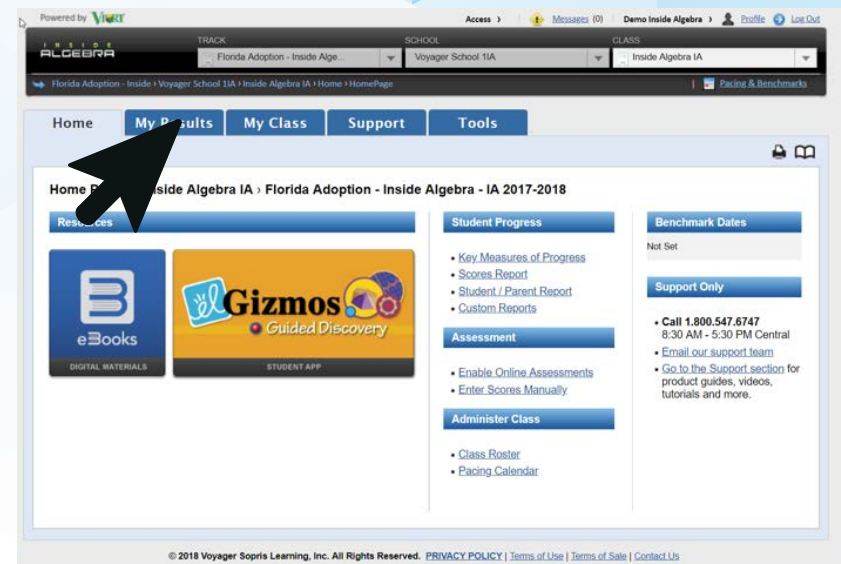
The image displays three overlapping assessment forms from the 'Inside Algebra' curriculum.

- Pretest (Top Left):** Labeled 'CHAPTER 9 • Objective 2 PRETEST'. It includes fields for Name and Date, and asks to 'Solve the equations.' with problems: 1. $8x = 16$, 2. $5y = -15$, 3. $\frac{1}{2}x = 7$, 4. $\frac{1}{3}x = 9$, 5. $\frac{2}{3}x = 2$, 6. $-2x = -18$, 7. $\frac{3}{4}x = 2$, 8. $-2x = -18$, 9. $-8.8 = 2.2x$.
- Apply Skills 1 (Middle):** Labeled 'APPLY SKILLS 1'. It includes fields for Name and Date, and asks to 'Solve each equation and check the answer.' An example shows solving $17x = -34$ to get $x = -2$, with a check: $17(-2) = -34$. Problems include: 1. 12 and 18 , 2. a^2b^3 and a^3b^3 , 3. $6x^2 + 9x$, 4. $x^2 + 6x = 0$, 5. $x^2 - x - 12$, 6. $x^2 - 8x + 15$, 7. $x^2 - 6x + 8 = 0$, 8. $x^2 - 4x - 12 = 0$, 9. $3x^2 - 16$, 10. $x^2 + 2x + 1$, 11. $x^2 + 14x + 49 = 0$, 12. $x^2 - 36 = 0$.
- Chapter 9 Test Form A (Bottom Right):** Labeled 'CHAPTER 9 TEST, FORM A'. It includes fields for Name and Date, and asks to 'Find the greatest common factor (GCF) of these pairs using prime factorization.' and 'Factor the quadratic polynomials.' It also includes 'Solve the quadratic equations by factoring.' and 'Solve the quadratic equations.' sections with various algebraic problems.

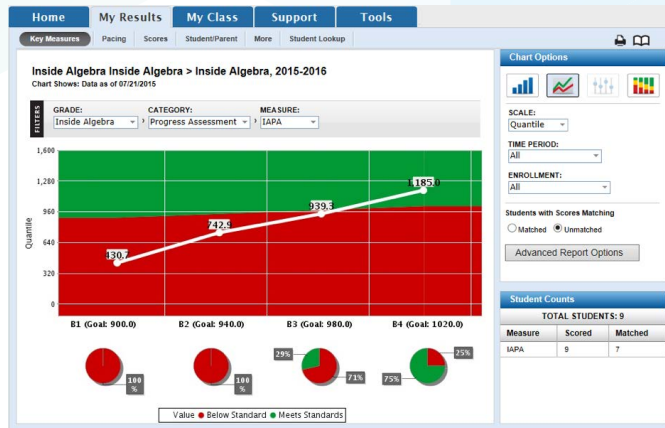
► Viewing Reports

All reports are conveniently stored in our data management system and easily accessed from the Teacher Center. Depending on the need and user, reports can be viewed from the district average level down to the individual student level.

- To view reports from the Teacher Center:
 - Click on** the My Results tab.
 - Click on** the Key Measures subtab (default starting location).
 - Click on** the Category scroll-down menu.
 - Choose** an assessment to view.



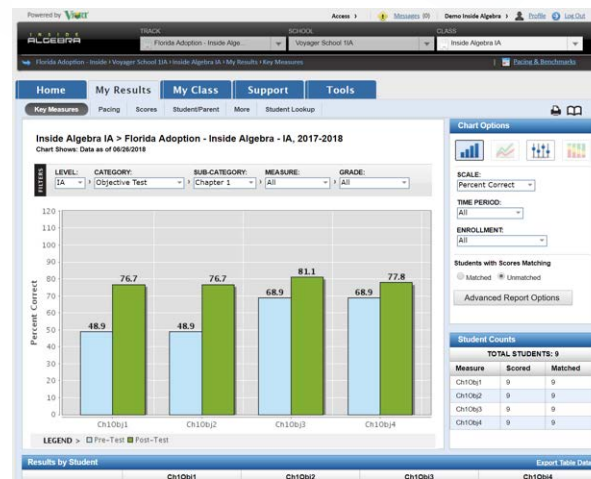
► Report Examples



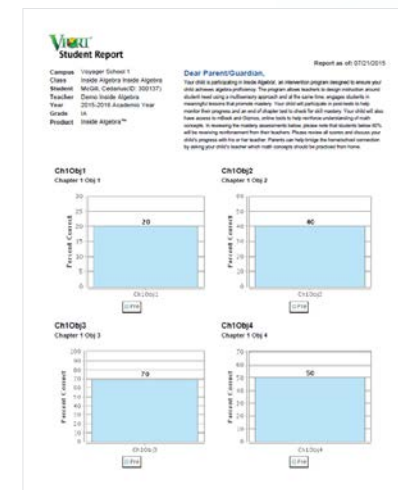
PAM Report



Chapter Test Report



Objectives Test Report



Parent Report

Student Technology & Engagement

Technology plays an integral role in teaching, but it must be used with purpose to be effective. Students in *Inside Algebra* have access to robust digital resources designed to enrich instruction, extend learning, and engage students in and out of the classroom.

Take a look at how technology enhances the *Inside Algebra* experience wherever and whenever students need it.

► Log in to the *Inside Algebra* Student Center

1. **Click on** “Enter the Student Center” from the Adoption Review site to begin.
2. **Enter the username and password** below to enter the *Inside Algebra* Student Center.
Username: **OharaD12**
Password: **BentTrip4**

INSIDE ALGEBRA

Username

Password

[Forgot Username or Password?](#)

LOGIN

System Requirements
If you do not have a green check, click to review requirements.
System Check

Customer Support
Call (800)-547-6747 between 8:30 am - 5:30 pm (CST)
Email our support team

Don't have an account? Learn how to get Inside Algebra at your school.

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FLORIDA 2018-2019 MATH ADOPTION
VOYAGER SOPRIS LEARNING™

**I N S I D E
ALGEBRA**
Welcome, Florida Math Adoption Reviewers!

Inside Algebra is an intensive Algebra 1 course that engages students with multisensory manipulatives, supports students with prerequisite skill lessons, and enriches students with a variety of differentiation opportunities. Each lesson follows an effective three-step design that includes: (1) conceptual development activities, (2) practice activities using games and small-group activities, and (3) problem-solving activities to illustrate real-world relevance. *Inside Algebra* is particularly suited for students who have struggled throughout foundational math courses or have previously been unsuccessful in Algebra 1. *Inside Algebra* is THE core for students in need of additional support to ensure algebra success.

DOWNLOAD THE REVIEWER GUIDE
We have created a comprehensive Reviewer Guide with step-by-step instructions for the digital review process. Please download and have this guide available before you begin to review.
DOWNLOAD NOW

WATCH THE OVERVIEW VIDEO
Please watch this brief overview video to get an introduction to *Inside Algebra* before beginning your exploration.

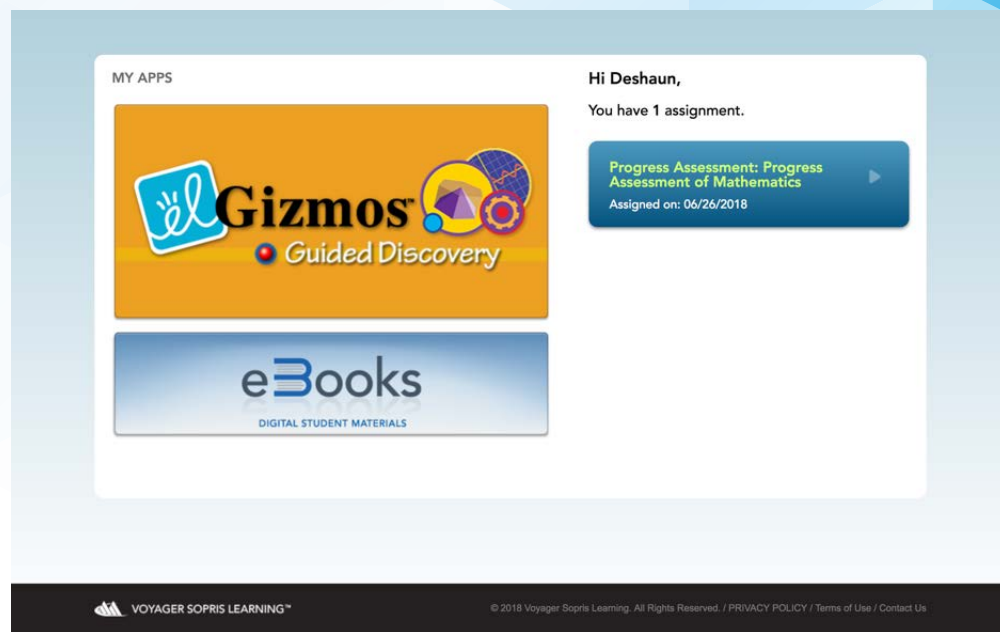
MAFS ALIGNMENT & OTHER RESOURCES
We have provided the following resources online to support your review of the materials.
Alignment to MAFS • Publisher Questionnaire
UDL Questionnaire • System Requirements
Bid Details

EXPLORE INSIDE ALGEBRA
Please have your Reviewer Guide available to log in and effectively navigate through the digital materials and begin with the Teacher Experience.
ENTER THE STUDENT CENTER
ENTER THE TEACHER CENTER

► Student Center Overview

The Student Center is the landing page from which students can access all digital materials and resources used in *Inside Algebra* including:

- 1. Student Assignments:** Any assignments or assessments a teacher has scheduled for the student will appear here.
- 2. Gizmos:** Provides entry into the ExploreLearning *Gizmos* digital manipulatives technology.
- 3. eBooks:** Includes digital versions of the print and digital-only books.



The screenshot displays the Student Center interface. On the left, under the heading "MY APPS", there are two main sections: "Gizmos Guided Discovery" with a colorful logo, and "eBooks DIGITAL STUDENT MATERIALS" with a blue gradient background. On the right, a personalized greeting "Hi Deshaun," is followed by the notification "You have 1 assignment." Below this, a blue button contains the text "Progress Assessment: Progress Assessment of Mathematics" and "Assigned on: 06/26/2018". At the bottom of the interface, the "VOYAGER SOPRIS LEARNING™" logo is on the left, and the copyright notice "© 2018 Voyager Sopris Learning. All Rights Reserved. / PRIVACY POLICY / Terms of Use / Contact Us" is on the right.

► Accessing ExploreLearning *Gizmos*

Students enter the ExploreLearning *Gizmos* application through the Student Center. Inside the application, activities are listed alongside the related *Inside Algebra* chapter.

The screenshot displays the 'INSIDE ALGEBRA' interface for the 'Gizmos' application. At the top, it says 'VOYAGER SOPHIS LEARNING' and 'Deshau'. Below the title, a welcome message reads: 'Welcome to Gizmos! Working with Gizmos makes math concepts easier to understand and fun to learn. Click on the Gizmo you wish to launch.' The 'el Gizmos' logo is in the top right. A list of activities is shown, each with a small icon and a right-pointing arrow:

- Chapter 5 — Slope-Intercept Form of a Line — Activity B
- Chapter 6 — Linear Inequalities in Two Variables — Activity A
- Chapter 6 — Solving Linear Inequalities Using Multiplication and Division
- Chapter 7 — Solving Linear Systems (Slope-Intercept Form)
- Chapter 7 — Systems of Linear Inequalities (Standard Form)
- Chapter 8 — Addition of Polynomials — Activity B
- Chapter 8 — Polynomials and Linear Factors
- Chapter 9 — Modeling the Factorization of $x^2 + bx + c$

► ExploreLearning *Gizmos* Digital Manipulatives

What are ExploreLearning *Gizmos*?

Gizmos are interactive simulations that students can manipulate to visualize and learn important concepts.

Why are ExploreLearning *Gizmos* important?

Gizmos engage and empower students to test and extend their conceptual understanding of complex algebra skills. As students work independently on fun activities, they self-discover connections between algebra and the real world.

Using Algebraic Equations
Translate equations into English sentences and translate English sentences into equations. Read the equation or sentence and select word tiles or symbol tiles to form the corresponding sentence or equation.

Model the equation:
a number increased by nine is equal to seven

(Drag tiles from the above bin into the workspace below to build your equation.)

"y + 9 = 7" ✔ Correct
OR
"a number increased by nine is equal to seven"

Assessment Questions (5):
1. In the equation $5 + p = 7$, what is the English translation of the variable p ?
 A. is equal to
 B. plus
 C. a number

Using Algebraic Expressions Activity

Square Roots
Explore the meaning of square roots using an area model. Use the side length of a square to find the square root of a decimal number or a whole number.

$\sqrt{60.84} = 7.8$
$7.8 \cdot 7.8 = 60.84$
$7 \cdot 7 = 49$
$7 \cdot 0.8 = 5.6$
$7 \cdot 0.8 = 5.6$
$0.8 \cdot 0.8 = 0.64$
Total = 60.84

Assessment Questions (4):
1. The side length of a square is equal to .
 A. the square of its area
 B. the square root of its area
 C. its area

Using Algebraic Expressions Activity

Gizmos
Polynomials and Linear Factors

CONTROLS TABLE

$y = (x - a)(x - b)(x - c)$

$y = (x - 3)(x + 2)(x - 1)$

a

b

c

d

Show unfactored form

Tools

Polynomials and Linear Factors Activity

► Hands-on Student Manipulatives

What are the Hands-on Manipulatives?

Each *Inside Algebra* teacher set comes with manipulatives such as algebra tiles, counters, and a variety of dice that are utilized throughout instruction. Teachers are given explicit instructions about how to incorporate hands-on manipulatives into the daily lesson.

Why are the Hands-on Manipulatives important?

The manipulatives-based activities promote student participation and action with instructional purpose. The manipulatives incorporate multisensory and tactile learning of algebra skills and concepts which provides students with an experience that can't be accomplished on paper.

Students learn about inequalities by using a balance scale.

Objective 1
Concept Development
Activities

CD 4 Using a Balance Scale

Use with 5-Day Instructional Plan. In this activity, students add or subtract the same value from both sides of an inequality to solve for the variable.

MATERIALS

- Elementary balance scale, one per group
- Weights for each balance (cubes, chips, paper clips—any uniform weight)
- Small paper bag, one per group

DIRECTIONS

- Review the following term and symbols with students:

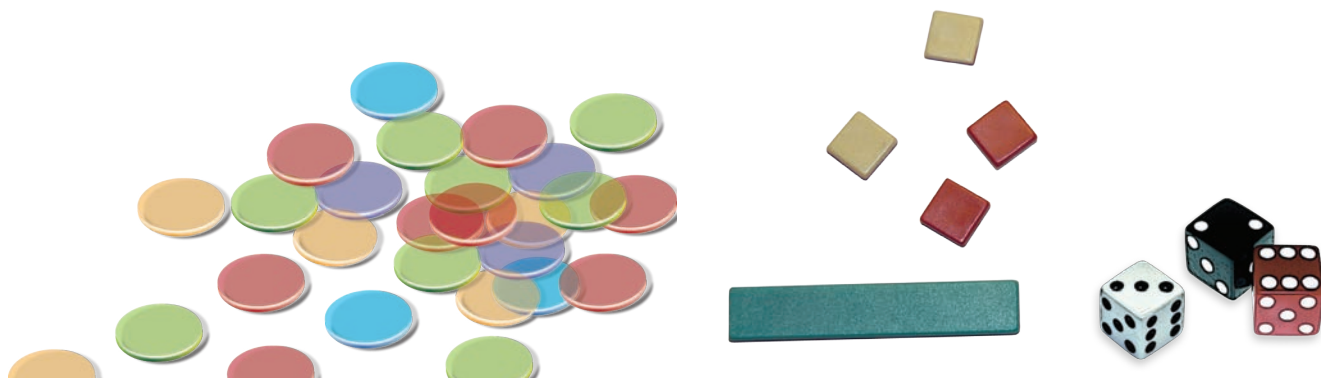
inequality A mathematical sentence that compares two expressions using one of the following symbols:

 - > Greater than
 - ≥ Greater than or equal to
 - < Less than
 - ≤ Less than or equal to
- Divide students into groups of four or five. Put nine weights in each paper bag and close the bags. Give each group one of the paper bags, a balance scale, and extra weights.
- Explain that the paper bag has weights in it. Instruct students not to open the bags or try to feel the number of weights. Have groups put the paper bag on one side of the scale and three weights on the other side. Ask the class which is heavier. *The paper bag*
- Tell students to let the paper bag be x , and have them write an inequality to represent the balance. Solicit answers to get $x > 3$. This can be interpreted to mean there are more than three weights in the paper bag.
- Have the groups add two more weights to each side of the balance. Point out that nothing happened. Have students write an inequality to model what we did, and explain that because they added the same amount to each side, the inequality stayed the same. $x + 2 > 3 + 2$
- Ask students to think about what will happen if we add 10 weights to each side, or if we add 100 weights to each side. Make sure students recognize that as long as we add the same amount to each side, the heavier side will remain heavier. Ask the class to summarize by writing an inequality with only variables. $x > y \rightarrow x + a > y + a$





Chapter 6 • Objective 1 477



► Interactive Games

What are Interactive Games?

Many activities employ small-group games to practice and reinforce skills and standards.

Why are Interactive Games important?

Games and competition help fuel a student's engagement and willingness to participate and collaborate with other students. Within the game activities, students support and learn from each other while gaining confidence in their algebra skills.

Objective 1 Practice Activities

PA 1 Finding the Solution Path


Use with 5-Day or 3-Day Instructional Plan. In this activity, students play a game that requires them to solve algebra problems.

MATERIALS

- Blackline Master 35
- Dice, one per group
- Game markers, one per student

DIRECTIONS

- Divide the class into groups of four.
- Distribute one copy of Blackline Master 35, Solve Game Board, to each group. Give each group one die. If possible, use dice that are numbered 1, 2, 3, 1, 2, 3. This will provide more practice.
- Explain the game rules.
 - Tell everyone to put a marker on the start space. Students should take turns rolling the die to determine who goes first. The largest number goes first. Students in each group take turns moving, in clockwise order.
 - Have the first student roll the die and move his or her marker the number of spaces shown on the die. The student writes the problem shown on that space on a piece of paper, then works the problem.
 - The group checks each student's problem on his or her turn. If the student's answer is correct, the next person takes a turn. If the student's answer is incorrect, the student returns his or her marker to its previous spot.
 - Students might need to work a problem already worked by another student. If this happens, have them do their own work without looking back at the other player's problem.
 - Play continues until a player gets to the finish space. Students can repeat the game several times.



NEXT STEPS • Differentiate

11 5-Day Instructional Plan: PA 2, page 179—Students completing the activity for the first time who demonstrate understanding of the concept, for additional practice and problem solving
CD 2, page 176—Students who are doing this activity for the first time and need additional concept development

PM 2, page 182—Students who are doing this activity for the second time, to assess progress

11 3-Day Instructional Plan: PM 2, page 182—Students completing the activity for the first time who demonstrate understanding of the concept, to assess progress

PM 1, page 181—Students completing the activity for the first time who need additional support, to assess progress

Objective 1 Posttest, page 185—Students who are doing this activity for the second time

Find the Solution Board Game

Objective 1 Practice Activities

PA 2 Playing Inequality Bingo

Use with 5-Day or 3-Day Instructional Plan. In this activity, students solve inequalities involving addition and subtraction.

MATERIALS

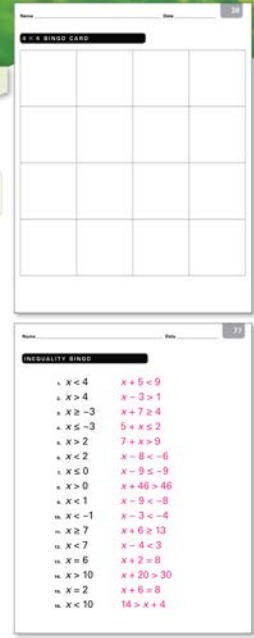
- Blackline Master 38
- Blackline Master 77
- Game markers to cover squares

DIRECTIONS

- Review the following term and symbols with students:

inequality A mathematical sentence that compares two expressions using one of the following symbols:

 - > Greater than
 - ≥ Greater than or equal to
 - < Less than
 - ≤ Less than or equal to
- Distribute one copy of Blackline Master 38, 4 × 4 Bingo Card, to each student.
- Make a transparency of Blackline Master 77, Inequality Bingo, and show it on the overhead. Alternatively, copy the inequalities from Blackline Master 77 on the board. Have students write the inequalities in the squares of the bingo card in a random fashion.



Inequality Bingo

Objective 1 Practice Activities

PA 2 Playing Quadratic Function Rummy

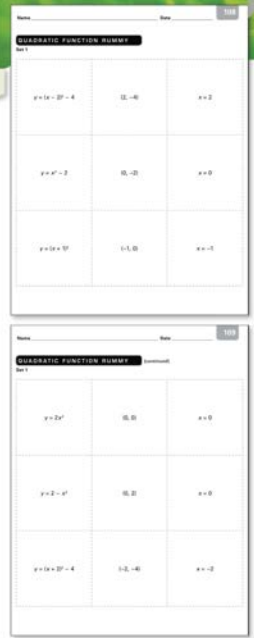
Use with 5-Day Instructional Plan. In this activity, students recognize a quadratic function, the vertex, and the axis of symmetry.

MATERIALS

- Blackline Masters 108–114 or blank cards

DIRECTIONS

- Review the following terms with students:
 - axis of symmetry** The vertical line through the vertex
 - vertex** The turning point of a parabola
- Tell students this activity will strengthen their skills with recognizing a quadratic function, the vertex, and the axis of symmetry.
- Have students work in groups of four or five. Distribute one copy of Blackline Masters 108–114, Quadratic Function Rummy, to each group. Have each group choose two of the three sets and cut them out to make one deck. Alternatively, have groups choose two of the three sets and copy each onto blank cards. The deck of cards will have three kinds of cards:
 - quadratic equations
 - vertices
 - axis of symmetry equations
- Have each group shuffle their deck of cards. Tell students to select someone in their group to be the dealer.
 - Explain the game rules to students.
 - The dealer deals cards one at a time to each player until all players have six cards. The dealer then places the remaining cards face-down at the center of the table, turns over the top card, and places it next to the remaining deck.
 - The person to the left of the dealer begins play.
 - The object of the game is to make sets consisting of a quadratic function card, a vertex card, and an axis of symmetry card that match.



Quadratic Function Rummy