Algebra 1

with CalcChat® and CalcView®

Common Core

TEACHING EDITION

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Laurie Boswell

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One Voice From Kindergarten through Algebra 2

Dr. Ron Larson and Dr. Laurie Boswell are a hands-on authorship team that began writing together in 1992. Since that time, they have authored over four dozen textbooks. This successful collaboration allows for one voice from Kindergarten through Algebra 2.

Ron Larson

Ron Larson, Ph.D., is well known as the lead author of a comprehensive program for mathematics that spans school mathematics and college courses. He holds the distinction of Professor Emeritus from Penn State Erie, The Behrend College, where he taught for nearly 40 years. He received his Ph.D. in mathematics from the University of Colorado. Dr. Larson's numerous professional activities keep him actively involved in the mathematics education community and allow him to fully understand the needs of students, teachers, supervisors, and administrators.

Ron Larson

Laurie Boswell

Laurie Boswell, Ed.D., is the former Head of School at Riverside School in Lyndonville, Vermont. In addition to textbook authoring, she provides mathematics consulting and embedded coaching sessions. Dr. Boswell received her Ed.D. from the University of Vermont in 2010. She is a recipient of the Presidential Award for Excellence in Mathematics Teaching and is a Tandy Technology Scholar. Laurie has taught math to students at all levels, elementary through college. In addition, Laurie has served on the NCTM Board of Directors and as a Regional Director for NCSM. Along with Ron, Laurie has co-authored numerous math programs and has become a popular national speaker.

Laurie Boswell

Contributors, Reviewers, and Research

Contributing Specialists and Reviewers

Big Ideas Learning would like to express our gratitude to the mathematics education and instruction experts who served as our advisory panel, contributing specialists, and reviewers during the writing of *Big Ideas Math Algebra 1 Common Core Edition*. Their input was an invaluable asset during the development of this program.

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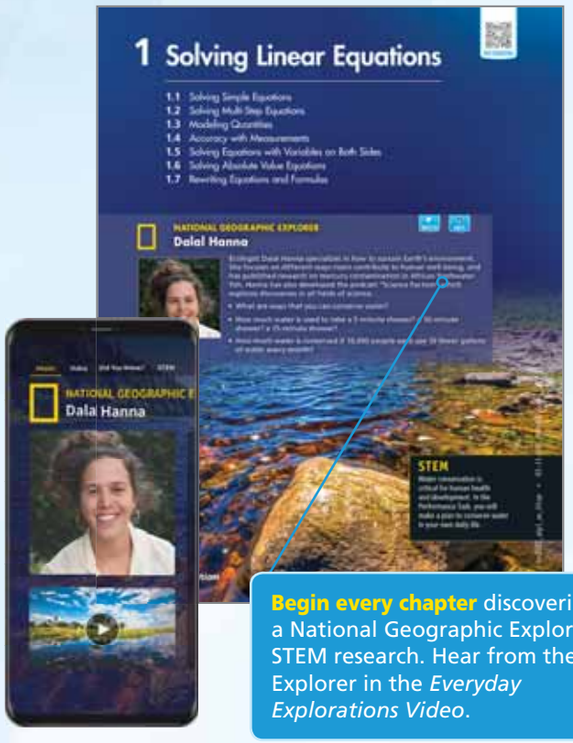
  Content Reviewer

Research

Ron Larson and Laurie Boswell developed this program using the latest in educational research, along with the body of knowledge collected from expert mathematics educators. This program follows the best practices outlined in the most prominent and widely accepted educational research, including:

- *Visible Learning*, John Hattie © 2009
- *Visible Learning for Teachers*, John Hattie © 2012
- *Visible Learning for Mathematics,* John Hattie © 2017
- *Principles to Actions: Ensuring Mathematical Success for All*, NCTM © 2014
- *Adding It Up: Helping Children Learn Mathematics,* National Research Council © 2001
- *Mathematical Mindsets: Unleashing Students' Potential through Creative Math, Inspiring Messages and Innovative Teaching,* Jo Boaler © 2015
- *Classroom Instruction That Works: Research-Based Strategies for Increasing Student Achievement*, Marzano, Pickering, and Pollock © 2001
- *What Works in Schools: Translating Research into Action,* Robert Marzano © 2003
- *Principles and Standards for School Mathematics*, NCTM © 2000
- Common Core State Standards for Mathematics, National Governors Association Center for Best Practices and the Council of Chief State School Officers © 2010
- *Universal Design for Learning Guidelines,* CAST © 2011
- *Rigorous PBL by Design: Three Shifts for Developing Confident and Competent Learners,* Michael McDowell © 2017
- Rigor/Relevance Framework® International Center for Leadership in Education
- *Understanding by Design*, Grant Wiggins and Jay McTighe © 2005
- Achieve, ACT, and The College Board
- *Evaluating the Quality of Learning: The SOLO Taxonomy,* John B. Biggs & Kevin F. Collis © 1982
- *Formative Assessment in the Secondary Classroom,* Shirley Clarke © 2005
- *Improving Student Achievement: A Practical Guide to Assessment for Learning,* Toni Glasson © 2009

Explore Every Chapter Through the Lens of STEM

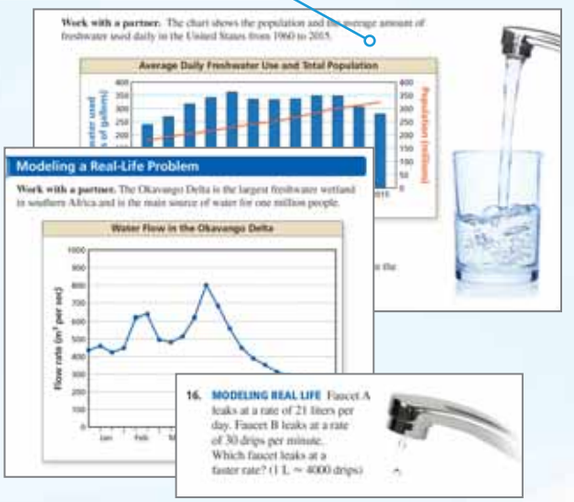


Begin every chapter discovering a National Geographic Explorer's STEM research. Hear from the Explorer in the *Everyday Explorations Video*.

National Geographic Explorers

Meet a National Geographic Explorer at the start of every chapter, and follow the context through the chapter to connect their research to your learning.

Throughout the chapter, revisit the Explorer's field of study to apply the math you are learning.



Conclude the chapter with a Performance Task related to the National Geographic Explorer's field of study. Explore the task digitally to experience additional insights.

Focus, Coherence, and Rigor

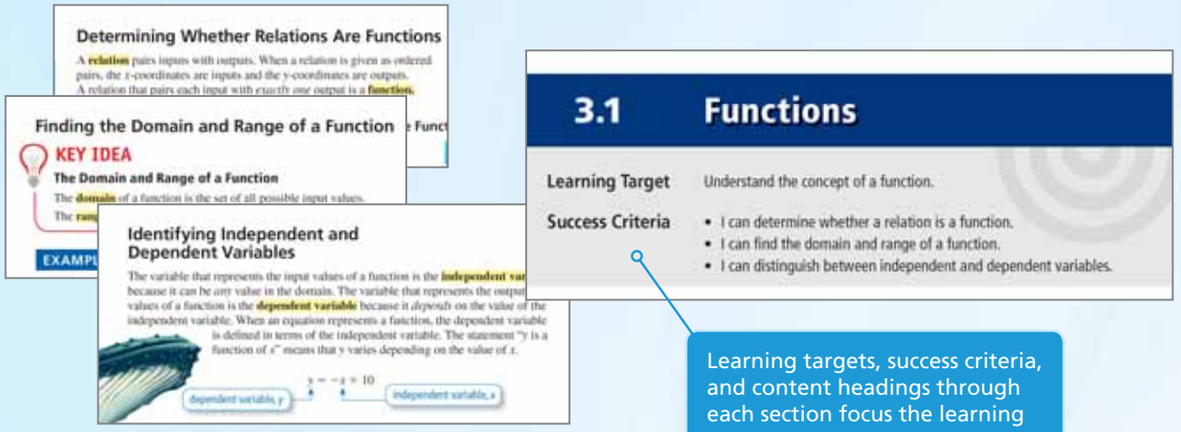
Instructional Design

A single authorship team from Kindergarten through Algebra 2 results in a seamless articulation of focused topics with meaningful coherence from course to course.

Every chapter and every lesson contain a rigorous balance of conceptual understanding, procedural fluency, and application.

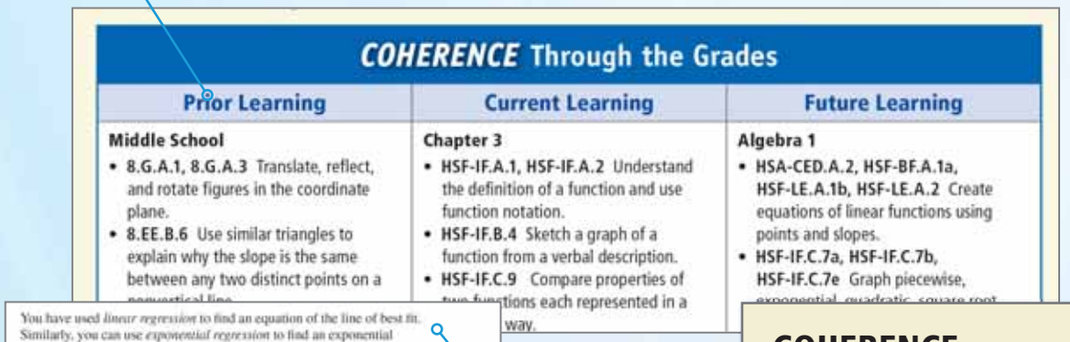
FOCUS

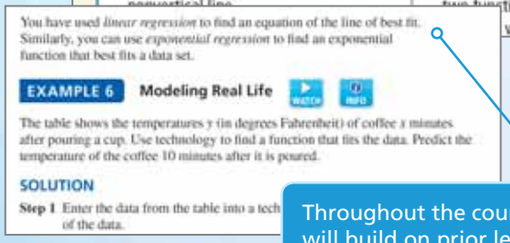
A focused program emphasizes the major work of each course, the widely applicable prerequisites needed for you to be college and career ready.



Learning targets, success criteria, and content headings through each section focus the learning into manageable chunks.

The authors gave careful thought to how the learning should progress from prior chapters and grades to future ones, as shown in the Teaching Edition progressions charts.





Throughout the course, you will build on prior learning as you learn new concepts.

COHERENCE

A coherent program has intentional progression of content between courses (building new understanding on foundations from prior years) and within the course (connecting concepts throughout).

from a Single Authorship Team

RIGOR

A rigorous program provides a balance of three important building blocks.

- **Conceptual Understanding**
  Discovering why
- **Procedural Fluency**
  Learning how
- **Application**
  Knowing when to apply

Conceptual Understanding
Explore, question, explain, and persevere as you discover foundational concepts central to the learning target of each section.

EXPLORE IT! Describing Relations

Work with a partner. You buy an item from the vending machine.

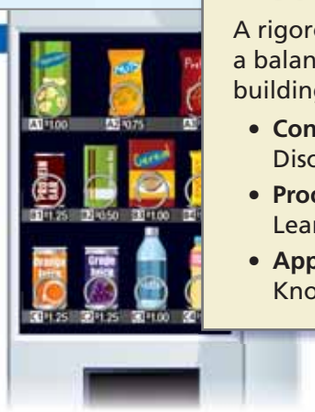
a. Describe two possible relations associated with the vending machine.

b. Think about each relation in part (a).
- What are the inputs?
- What are the outputs?
- Does each input pair with *exactly* one output? Explain.

In mathematics, a **function** is a relation that pairs each input with exactly one output.

c. How can you use a coordinate plane to represent a relation? What are the inputs? What are the outputs?

Math Practice
Contextualize Relationships
Can you think of any mathematical relations? Are any of these relations functions?



Conceptual Understanding
Understand the ideas behind key concepts, see them from varied perspectives, and explain their meaning.

42. **WRITING** A quadratic function is increasing when $x < 2$ and decreasing when $x > 2$. Is the vertex the highest or lowest point on the parabola? Explain.

53. **MP NUMBER SENSE** Without evaluating, order $(7 \cdot 7)^5$, $(7 \cdot 7)^{-8}$, and $(7 \cdot 7)^0$ from least to greatest. Explain your reasoning.

Procedural Fluency
Learn with clear, stepped-out teaching and examples, and become fluent through *Self-Assessment*, *Practice*, and *Review & Refresh*.

EXAMPLE 1 Graphing $f(x) = a(x - p)(x - q)$

Graph $f(x) = -(x + 1)(x - 5)$. Find the domain and range.

SOLUTION

Step 1 Identify the x-intercepts. Because the x-intercepts are $p = -1$ and $q = 5$, plot $(-1, 0)$ and $(5, 0)$.

Step 2 Find and graph the axis of symmetry.

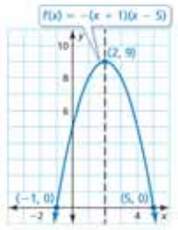
$$x = \frac{p + q}{2} = \frac{-1 + 5}{2} = 2$$

Step 3 Find and plot the vertex. The x-coordinate of the vertex is 2. To find the y-coordinate of the vertex, substitute 2 for x and evaluate.

$$f(2) = -(2 + 1)(2 - 5) = 9$$

So, the vertex is $(2, 9)$.

Step 4 Draw a parabola through the vertex and the points where the x-intercepts occur.



▶ The domain is all real numbers. The range is $y \leq 9$.

EXAMPLE 6 Modeling Real Life

A jellyfish emits about 1.25×10^8 particles of light, or photons, in 6.25×10^{-4} second. How many photons does the jellyfish emit each second? Write your answer in scientific notation and in standard form.

SOLUTION

Divide to find the unit rate in photons per second.

$$\frac{1.25 \times 10^8}{6.25 \times 10^{-4}} \quad \begin{matrix} \leftarrow \text{photons} \\ \leftarrow \text{seconds} \end{matrix}$$

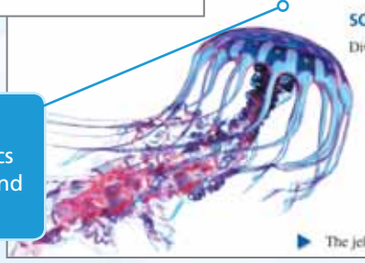
Divide the number of photons by the number of seconds.

$$= \frac{1.25}{6.25} \times \frac{10^8}{10^{-4}}$$ Rewrite.

$$= 0.2 \times 10^{12}$$ Simplify.

$$= 2 \times 10^{11}$$ Write in scientific notation.

▶ The jellyfish emits 2×10^{11}, or 200,000,000,000 photons per second.



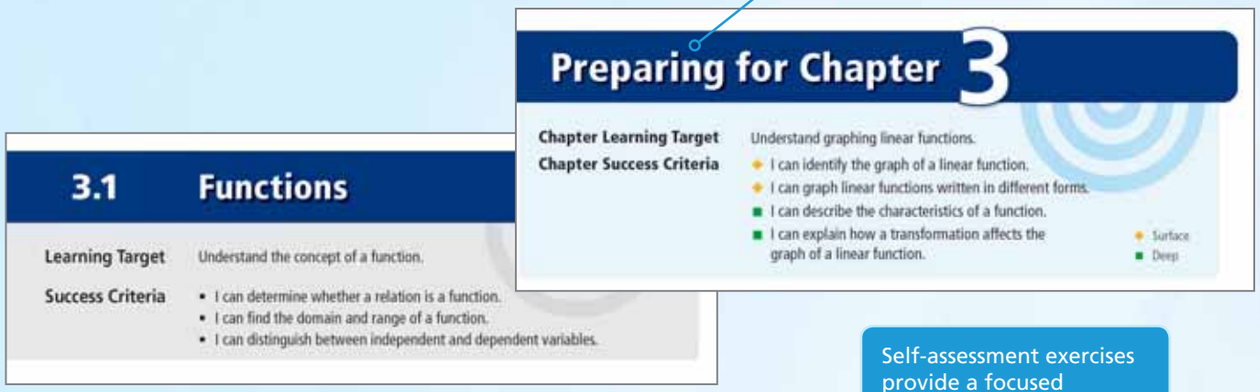
Application
Make meaning of mathematics in problem-solving contexts and real-life applications.

Visible Learning Through Learning Targets,

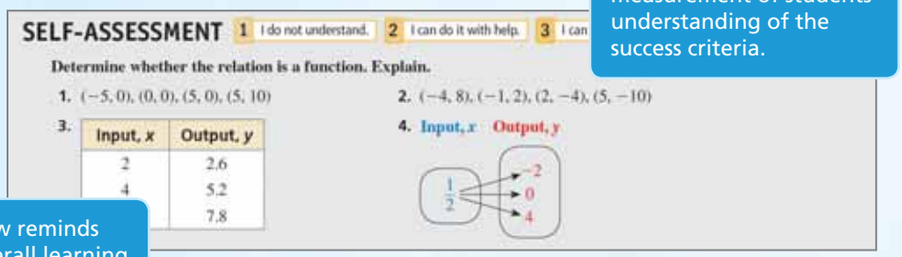
Making Learning Visible

Knowing the learning intention of a chapter or lesson helps learners focus on the purpose of an activity, rather than simply completing it in isolation. This program supports visible learning through the consistent use of learning targets and success criteria to ensure positive outcomes for all students.

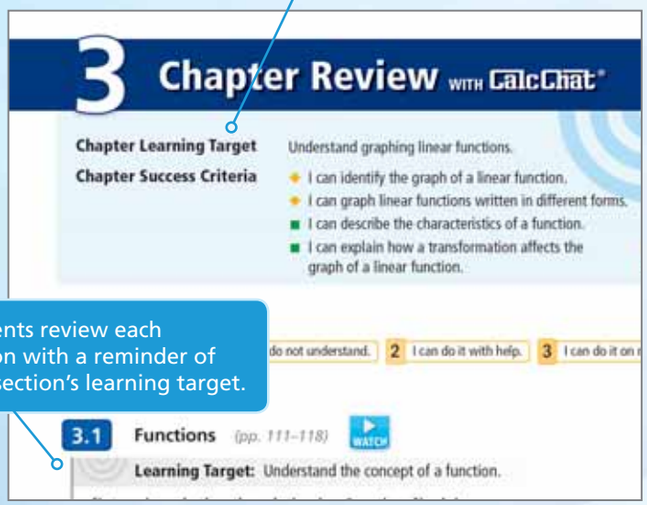
Every chapter and section show a Learning Target and related Success Criteria. These are purposefully integrated into the structure of every carefully-written lesson.



Self-assessment exercises provide a focused measurement of students' understanding of the success criteria.



The Chapter Review reminds students of the overall learning target and success criteria for the chapter.



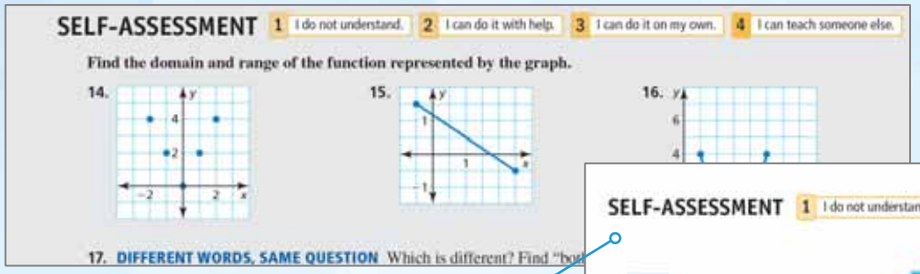
Students review each section with a reminder of that section's learning target.

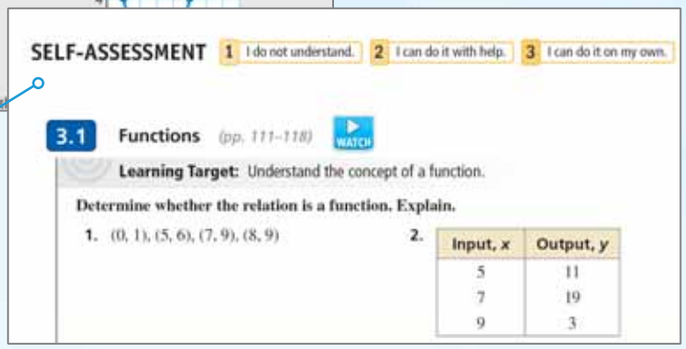
QUESTIONS FOR LEARNERS

As students progress through a section, they should be able to answer the following questions.

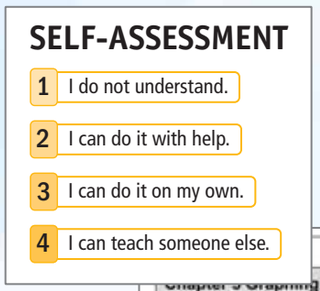
1. What are you learning?
2. Why are you learning this?
3. Where are you in your learning?
4. How will you know when you have learned it?
5. Where are you going next?

Success Criteria, and Self-Assessment

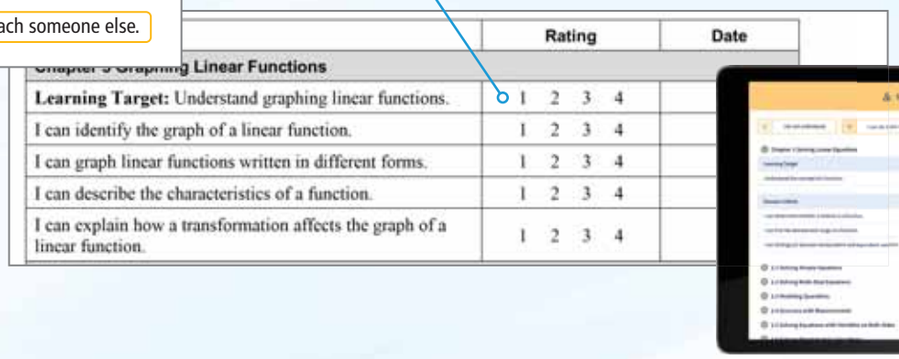




Self-Assessments are included throughout every section, and in the Chapter Review, to help students take ownership of their learning.



Students use the 4-point scale to rate their understanding of each success criterion. They keep track of their learning on paper or online.



Ensuring Positive Outcomes

John Hattie's *Visible Learning* research consistently shows that using learning targets and success criteria can result in two year's growth in one year, ensuring positive outcomes for student learning and achievement.

Sophie Murphy, M.Ed., wrote the chapter-level learning targets and success criteria for this program. Sophie is currently completing her Ph.D. at the University of Melbourne in Australia with Professor John Hattie as her leading supervisor. Sophie completed her Masters' thesis with Professor John Hattie in 2015. Sophie has over 20 years of experience as a teacher and school leader in private and public-school settings in Australia.

Embedded Mathematical Practices

Encouraging Mathematical Mindsets

Developing proficiency in the **Mathematical Practices** is about becoming a mathematical thinker: learning to ask why and being able to reason and communicate with others as you learn. Use this guide to help you understand more about each practice.

BUILDING TO FULL UNDERSTANDING

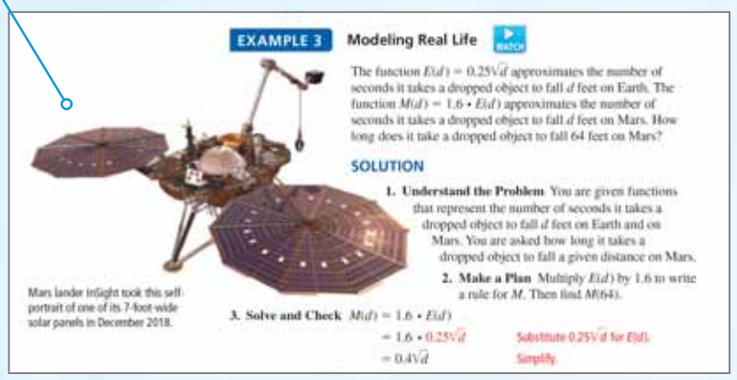
Throughout this course, you will have opportunities to demonstrate specific aspects of the mathematical practices. Labels throughout indicate gateways to those aspects. Collectively, these opportunities will lead you to a full understanding of each math practice. Developing these mindsets and habits will give meaning to the mathematics you learn.

1

One way to **Make Sense of Problems and Persevere in Solving Them** is to use the problem-solving plan. Take time to analyze the given information and what the problem is asking to help you to plan a solution pathway.

Look for these labels:

- Explain the Meaning
- Find Entry Points
- Analyze Givens
- Interpret a Solution
- Make a Plan
- Consider Similar Problems
- Check Progress
- Consider Simpler Forms
- PROBLEM SOLVING
- THOUGHT PROVOKING
- DIG DEEPER



EXAMPLE 3 Modeling Real Life

The function $E(d) = 0.25\sqrt{d}$ approximates the number of seconds it takes a dropped object to fall d feet on Earth. The function $M(d) = 1.6 \cdot E(d)$ approximates the number of seconds it takes a dropped object to fall d feet on Mars. How long does it take a dropped object to fall 64 feet on Mars?

SOLUTION

1. Understand the Problem You are given functions that represent the number of seconds it takes a dropped object to fall d feet on Earth and on Mars. You are asked how long it takes a dropped object to fall a given distance on Mars.

2. Make a Plan Multiply $E(d)$ by 1.6 to write a rule for M. Then find $M(64)$.

Mars lander InSight took this self-portrait of one of its 7-foot-wide solar panels in December 2018.

3. Solve and Check

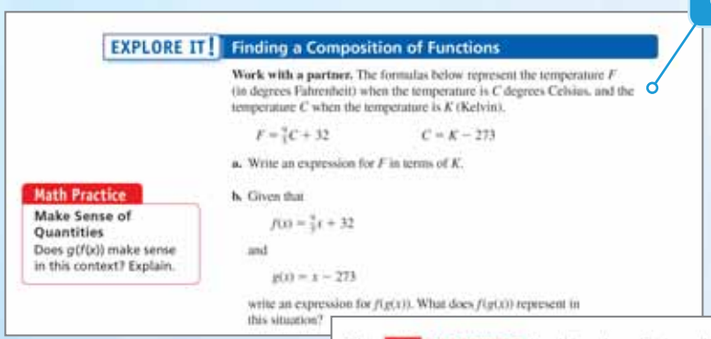
$M(d) = 1.6 \cdot E(d)$

$= 1.6 \cdot 0.25\sqrt{d}$ Substitute $0.25\sqrt{d}$ for $E(d)$.

$= 0.4\sqrt{d}$ Simplify.

2

You **Reason Abstractly** when you explore a concrete example and represent it symbolically. Other times you **Reason Quantitatively** when you see relationships in numbers or symbols and draw conclusions about a concrete example.



EXPLORE IT! Finding a Composition of Functions

Work with a partner. The formulas below represent the temperature F (in degrees Fahrenheit) when the temperature is C degrees Celsius, and the temperature C when the temperature is K (Kelvin).

$F = \frac{9}{5}C + 32$ $C = K - 273$

a. Write an expression for F in terms of K.

b. Given that

$f(x) = \frac{9}{5}x + 32$

and

$g(x) = x - 273$

write an expression for $f(g(x))$. What does $f(g(x))$ represent in this situation?

Math Practice

Make Sense of Quantities

Does $g(f(x))$ make sense in this context? Explain.

11. **MP REASONING** Explain why a V-shaped graph does *not* represent a linear function.

12. **MP REASONING** How can you tell whether a graph shows a discrete domain or a continuous domain?

Look for these labels:

- Make Sense of Quantities
- Use Equations
- Use Expressions
- Understand Quantities
- Use Operations
- Contextualize Relationships
- Reason Abstractly
- REASONING
- NUMBER SENSE

3

When you **Construct Viable Arguments and Critique the Reasoning of Others**, you make and justify conclusions and decide whether others' arguments are correct or flawed.

25. **MAKING AN ARGUMENT** Your friend says that a line always represents a function. Is your friend correct? Explain.

Math Practice

Make Conjectures

Which type of reasoning helps you to make a conjecture? Which type helps you to justify a conjecture? How do you know when to use each type?

Math Practice

Listen and Ask Questions

Ask a few classmates to read their answers to parts (b)–(d). Ask any questions you have about their answers.

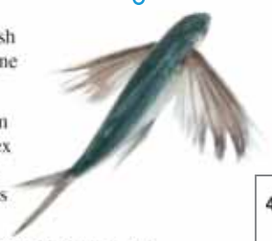
Look for these labels:

- Use Assumptions
- Use Definitions
- Use Prior Results
- Make Conjectures
- Build Arguments
- Analyze Conjectures
- Use Counterexamples
- Justify Conclusions
- Compare Arguments
- Construct Arguments
- Listen and Ask Questions
- Critique Reasoning
- MAKING AN ARGUMENT
- LOGIC
- ERROR ANALYSIS
- DIFFERENT WORDS, SAME QUESTION
- WHICH ONE DOESN'T BELONG?

4

To **Model with Mathematics**, you apply the math you have learned to a real-life problem, and you interpret mathematical results in the context of the situation.

45. **MODELING REAL LIFE** Flying fish use their pectoral fins like airplane wings to glide through the air.



a. Write an equation of the form $y = a(x - h)^2 + k$ with vertex (33, 5) that models the flight path, assuming the fish leaves the water at (0, 0).

b. What are the domain and range of the function? What do they represent in this situation?

c. Does the value of a change when the flight path has vertex (30, 4)? Justify your answer.

Look for these labels:

- Apply Mathematics
- Simplify a Solution
- Use a Diagram
- Use a Table
- Use a Graph
- Use a Formula
- Analyze Relationships
- Interpret Results
- MODELING REAL LIFE
- PROBLEM SOLVING

43. **MP PROBLEM SOLVING** An online ticket agency charges the amounts shown for basketball tickets. The total cost for an order is $220.70. How many tickets are purchased?

Charge	Amount
Ticket price	$32.50 per ticket
Convenience charge	$3.30 per ticket
Processing charge	$5.90 per order

Embedded Mathematical Practices (continued)

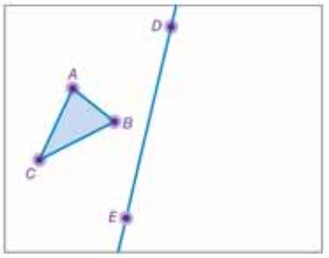
5

To **Use Appropriate Tools Strategically**, you need to know what tools are available and think about how each tool might help you solve a mathematical problem. You can use a tool for its advantages, while being aware of its limitations.

9. MP **CHOOSE TOOLS** For a large data set, would you use a stem-and-leaf plot or a histogram to show the distribution of the data? Explain.

EXPLORE IT! Reflecting Figures in Lines

Work with a partner. Use technology to draw any scalene triangle and label it $\triangle ABC$. Draw any line, $\overleftrightarrow{DE}$, and another line that is parallel to $\overleftrightarrow{DE}$.



a. Reflect $\triangle ABC$ in $\overleftrightarrow{DE}$, followed by a reflection in the other line to form $\triangle A''B''C''$. What do you notice? Make several observations.

b. Is there a single transformation that maps $\triangle ABC$ to $\triangle A''B''C''$? Explain.

c. Repeat parts (a) and (b) with other figures. What do you notice?

d. Using the same triangle and line $\overleftrightarrow{DE}$, draw line $\overleftrightarrow{DF}$ that intersects $\overleftrightarrow{DE}$ at point D so that $\angle EDF$ is an acute or right angle. Then reflect $\triangle ABC$ in $\overleftrightarrow{DE}$, followed by a reflection in $\overleftrightarrow{DF}$ to form $\triangle A''B''C''$. What do you notice? Make several observations.

Look for these labels:
- Choose Tools
- Recognize Usefulness of Tools
- Use Other Resources
- Use Technology to Explore
- CHOOSE TOOLS
- USING TOOLS

MP **PRECISION** **In Exercises 27–30, determine whether the statement uses the word *function* in a way that is mathematically correct. Explain your reasoning.**

27. The selling price of an item is a function of the cost of making the item.

28. The sales tax on a purchased item in a given state is a function of the selling price.

29. A function pairs each student in your school with a homeroom teacher.

30. A function pairs each chaperone on a school trip with 10 students.

Math Practice

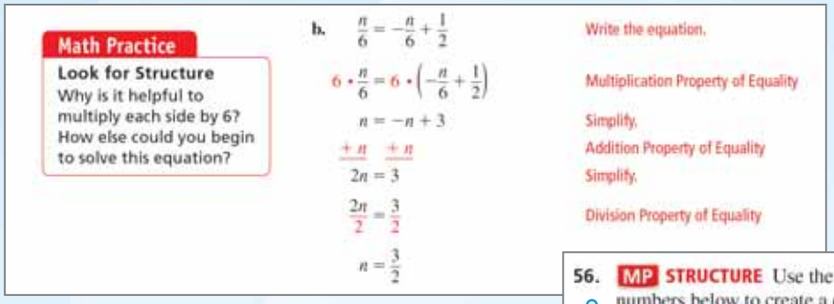
Communicate Precisely

In part (b), for a function $y = f(x)$, explain the meaning of f, x, and $f(x)$.

When you **Attend to Precision**, you are developing a habit of being careful how you talk about concepts, label your work, and write your answers.

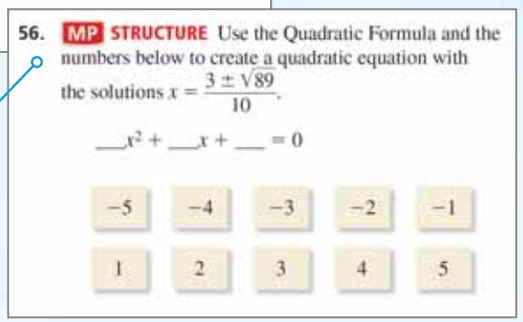
6

Look for these labels:
- Communicate Precisely
- Use Clear Definitions
- State the Meaning of Symbols
- Specify Units
- Label Axes
- Calculate Accurately
- Understand Mathematical Terms
- PRECISION



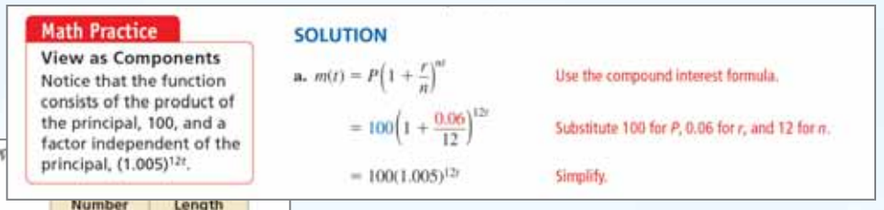
Look for these labels:

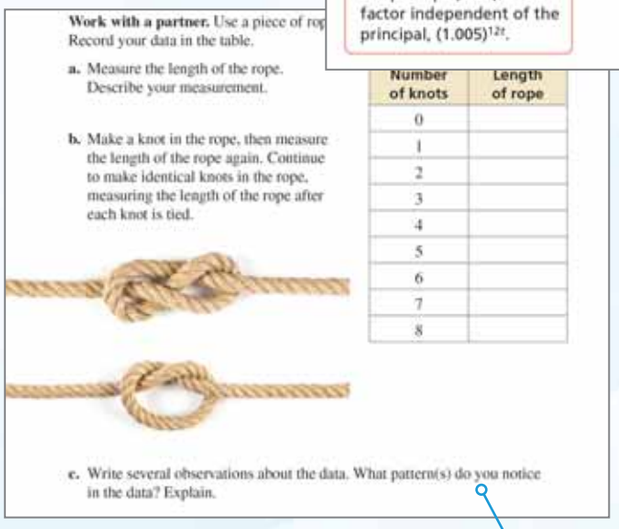
- View as Components
- Look for Patterns
- Look for Structure
- STRUCTURE
- PATTERNS

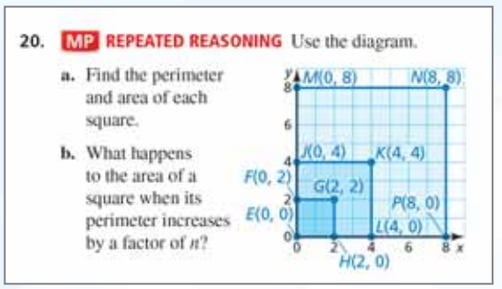


7

You **Look For and Make Use of Structure** by looking closely to see structure within a mathematical statement, or stepping back for an overview to see how individual parts make one single object.







Look for these labels:

- Repeat Calculations
- Find General Methods
- Maintain Oversight
- Evaluate Results
- REPEATED REASONING

When you **Look For and Express Regularity in Repeated Reasoning**, you can notice patterns and make generalizations. Keeping in mind the goal of a problem helps you evaluate reasonableness of answers along the way.

8

The Modeling Process

Modeling Real Life

Learning how to apply the mathematics you learn to model real-life situations is an important part of this course. Here are some ways you may approach the modeling process.

THE PROBLEM-SOLVING PLAN

1. **Understand the Problem**
   Before planning a solution, you must identify what the problem is asking, analyze givens and goals, and think about entry points to a solution.
2. **Make a Plan**
   Plan your solution pathway before jumping in to solve. Identify any variables or relationships and decide on a problem-solving strategy.
   - Use a verbal model
   - Draw a diagram
   - Write an equation
   - Solve a simpler problem
   - Sketch a graph or number line
   - Make a table
   - Make a list
   - Break the problem into parts
3. **Solve and Check**
   As you solve the problem, be sure to monitor and evaluate your progress, and always check your answers. Throughout the problem-solving process, you must continually ask, "Does this make sense?" and be willing to change course if necessary.

66. **PERFORMANCE TASK** The black rhino is a critically endangered species with a current population of about 5500. In the late 1900s, the population decreased by 98% to about 2500. Create a plan to restore the black rhino population. Include the expected annual growth rate and the amount of time it will take to restore the population. Explain how you will determine whether your plan is working over time.

Creating a Model
In a *Performance Task*, you first identify the problem and the variables in a situation and decide what questions to ask or models to create. Any answers you obtain must always be interpreted in the context of the situation to determine whether they are viable.

73. **MP PROBLEM SOLVING** When X-rays of a fixed wavelength strike a material x centimeters thick, the intensity $I(x)$ of the X-rays transmitted through the material is given by $I(x) = I_0 e^{-\mu x}$, where I_0 is the initial intensity and μ is a value that depends on the type of material and the wavelength of the X-rays. The table shows the values of μ for various materials and X-rays of medium wavelength.

Material	Aluminum	Copper	Lead
Value of μ	0.43	3.2	43

You wear a lead apron to protect you from harmful radiation while your dentist takes X-rays of your teeth. Explain why lead is a better material to use than aluminum or copper.

Interpreting Parameters Within a Context
To be able to interpret the parameters of a situation, you must understand the significance of the variables. Knowing how they relate and affect one another will help you find an entry point and make a plan to solve.

Defining Quantities
In this problem, you know that the side length of the map doubles on each click, and you are given the lengths for the first few clicks. You need to know how many clicks will make the side length 640 miles.

Writing Functions
You know that the side length of the map is related to the number of clicks. Your plan should include writing a function to represent that relationship.

EXAMPLE 5 Modeling Real Life

WATCH

Clicking the *zoom-out* button on a mapping website doubles the side length of the square map. After how many clicks on the *zoom-out* button is the side length of the map 640 miles?

Zoom-out clicks	1	2	3
Map side length (miles)	5	10	20

SOLUTION

1. **Understand the Problem** You know that the side length of the square map doubles after each click on the *zoom-out* button. So, the side lengths of the map represent the terms of a geometric sequence. You need to find the number of clicks it takes for the side length of the map to be 640 miles.
2. **Make a Plan** Begin by writing a function f for the nth term of the geometric sequence. Then find the value of n for which $f(n) = 640$.
3. **Solve and Check** The first term is 5, and the common ratio is 2.

$f(n) = a_1 r^{n-1}$ Function for a geometric sequence

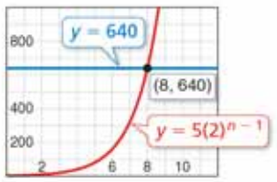
$f(n) = 5(2)^{n-1}$ Substitute 5 for a_1 and 2 for r.

The function $f(n) = 5(2)^{n-1}$ represents the geometric sequence. Use this function to find the value of n for which $f(n) = 640$. So, use each side of the equation $640 = 5(2)^{n-1}$ to write a function.

$y = 5(2)^{n-1}$

$y = 640$

Then use technology to graph the functions and find the point of intersection. The point of intersection is (8, 640).



So, after eight clicks, the side length of the map is 640 miles.

Another Method Find the value of n for which $f(n) = 640$ algebraically.

$640 = 5(2)^{n-1}$ Write the equation.

$128 = (2)^{n-1}$ Divide each side by 5.

$2^7 = (2)^{n-1}$ Rewrite 128 as 2^7.

$7 = n - 1$ Equate the exponents.

$8 = n$ ✓ Add 1 to each side.

Analyze Functions Using Different Representations
Graphing your function and the line $y = 640$ allows you to approximate a solution.

Solving an Equation to Solve a Problem
Step 3 of the problem-solving plan must always include checking your results. In this case, you can solve using another method to make sure you get the same answer.

MODELING STANDARDS

For a full list of opportunities to practice all the modeling standards of this course, visit *BigIdeasMath.com*.

Highest-Impact Strategies

Purposeful Focus

Many of the things we do as educators have a positive effect on student learning, but which ones have the greatest impact? This program purposefully integrates five key strategies proven to have the highest impact on student achievement.

TEACHER CLARITY

Before starting a new topic, make clear the learning target. As students explore and learn, continually connect their experiences back to the success criteria so they know where they are in their learning.

Where Are We In Our Learning?

- "The first success criterion is about identifying linear functions using graphs, tables, and equations. Does the data you collected in the exploration represent a function? Explain." Yes, every input has exactly one output. "How can you tell from the table that the function is linear?" *Sample answer:* The rate of change is constant. "How can you tell from the graph that the function is linear?" The points lie on a line.
- **FEEDBACK** It is important to make a connection between students' experiences and the success criteria. You are providing explicit instruction on how to identify success (learning).

- **FEEDBACK** After students complete the Self-Assessment, have them check their work and solutions with their elbow partners. Then say, "These exercises are related to the first two success criteria. Where are you in your learning?"

FEEDBACK

Actively listen as you probe for student understanding, being mindful of the feedback that you provide. Through feedback you see where your students are in their learning and make instructional decisions for where to go next.

- Show students a picture of a stack of the same object, such as copies of the same book. The top of the stack should not be visible.
- **? TURN AND TALK** "If you know the height of the stack and the height of one book, how can you estimate the number of books in the stack?" Divide the height of the stack by the height of one book.

CLASSROOM DISCUSSION

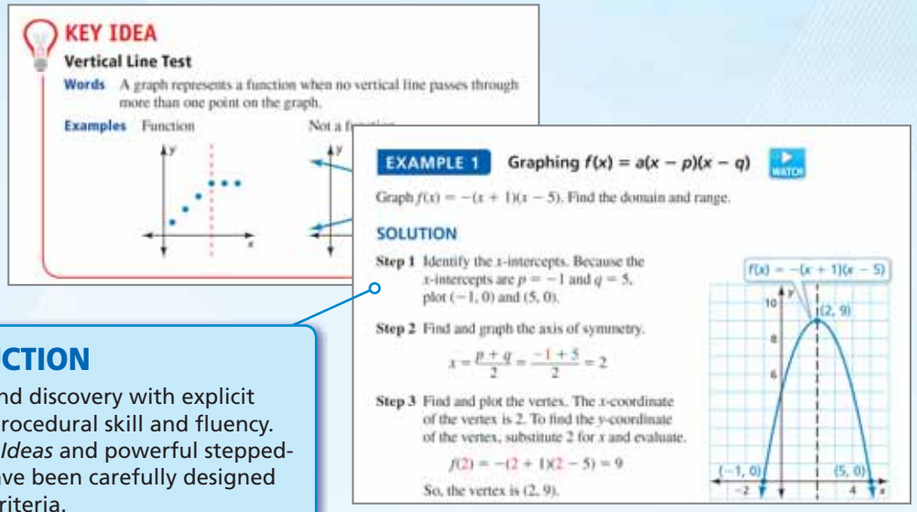
Encourage your students to talk together! This solidifies understanding while honing their ability to reason and construct arguments. Students benefit from hearing the reasoning of classmates and hearing peers critique their own reasoning.

Daily Support from a Master Educator

In Laurie's Notes, master educator Laurie Boswell uses her professional training and years of experience to help you guide your students to better understanding.

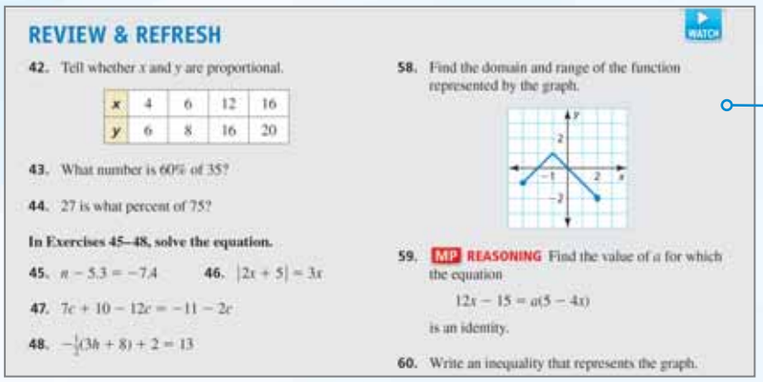
Laurie studied Professor John Hattie's research on *Visible Learning* and met with Hattie on multiple occasions to ensure she was interpreting his research accurately and embedding it effectively. Laurie's expertise continues with an ongoing collaboration with Sophie Murphy, who is pursuing her Ph.D. under Professor Hattie.

for Student Achievement



DIRECT INSTRUCTION

Follow exploration and discovery with explicit instruction to build procedural skill and fluency. Teach with clear *Key Ideas* and powerful stepped-out *Examples* that have been carefully designed to meet the success criteria.



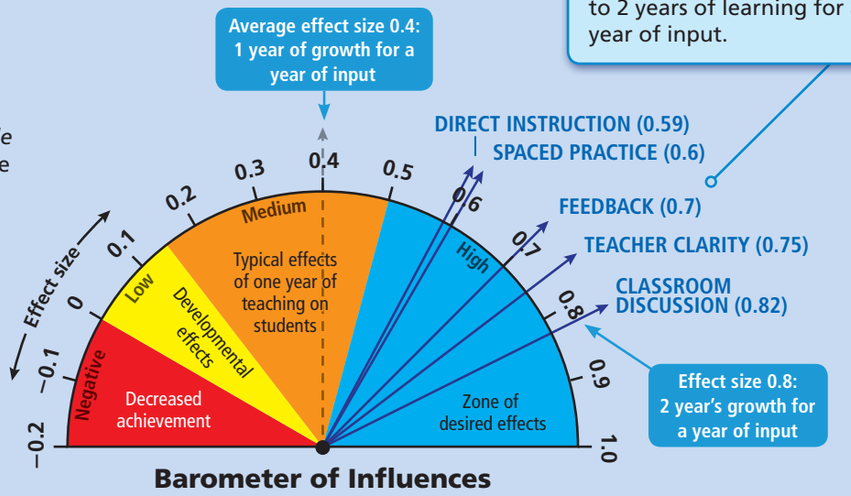
SPACED PRACTICE

Assign *Review & Refresh* exercises in every section to provide continual practice on the major topics. Effective homework does not just focus on a single topic of new learning; students must revisit concepts over time so deeper learning occurs.

Five Strategies for Purposeful Focus

Professor John Hattie, in his *Visible Learning* network, identified more than 250 influences on student learning, and developed a way of ranking them. He conducted meta-analyses and compared the influences by their **effect size**—the impact the factor had on student learning.

We focus on **STRATEGIES WITH THE HIGHEST IMPACT** on student achievement—up to 2 years of learning for a year of input.

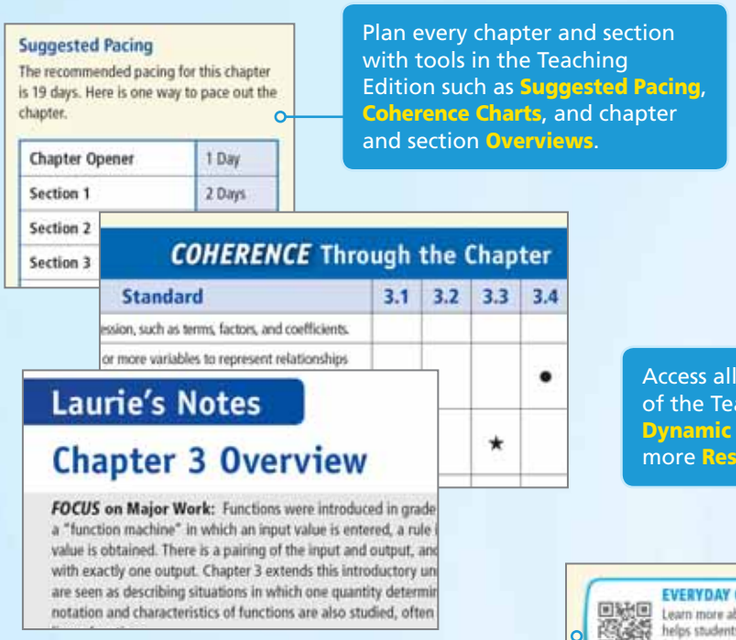


How to Use This Program: Plan

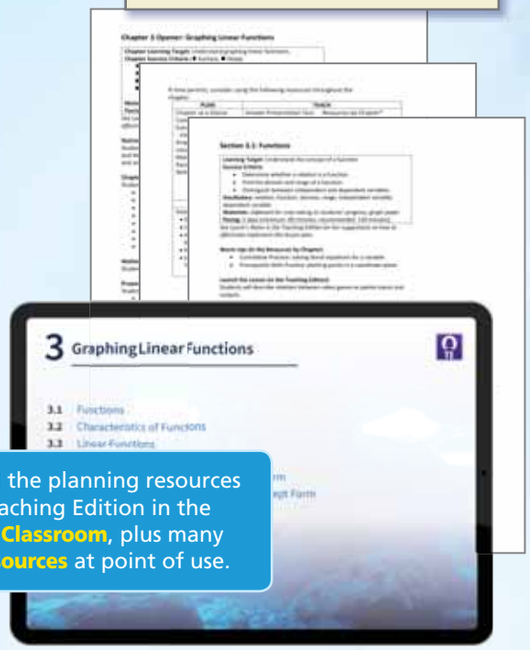
Taking Advantage of Your Resources

You, the teacher, play an indispensable role in your students' learning. This program provides rich resources to help you Plan, Teach, and Assess for learners of all levels.

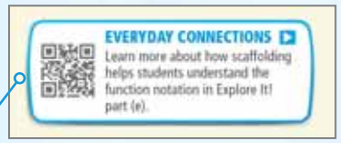
LEARN MORE about these and other program resources at the beginning of every chapter.



Plan every chapter and section with tools in the Teaching Edition such as **Suggested Pacing**, **Coherence Charts**, and chapter and section **Overviews**.



Access all the planning resources of the Teaching Edition in the **Dynamic Classroom**, plus many more **Resources** at point of use.



Watch **Everyday Connections Videos** for quick insights on specific pieces of math content or technology.

SCAFFOLD FOR ENGLISH LEARNERS

Notes throughout the Teaching Edition indicate possibilities to support students as they develop the language needed to convey understanding.

Clarify, Connect, and Scaffold

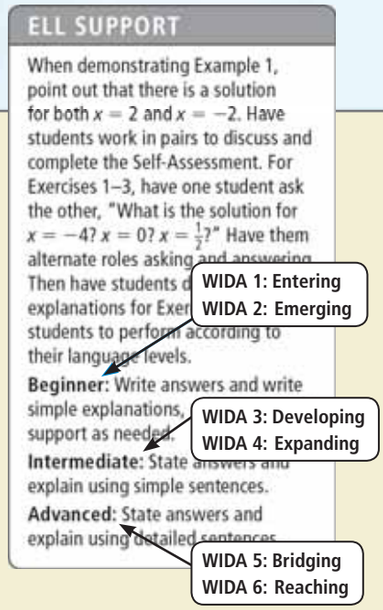
- Clarify language that may be difficult or confusing for English Learners
- Connect new learning to something students already know
- Target Beginner, Intermediate, and Advanced English learners, which correspond to WIDA language mastery levels

Practice Language and Content

- Practice math while improving language skills
- Use language as a resource to develop procedural fluency

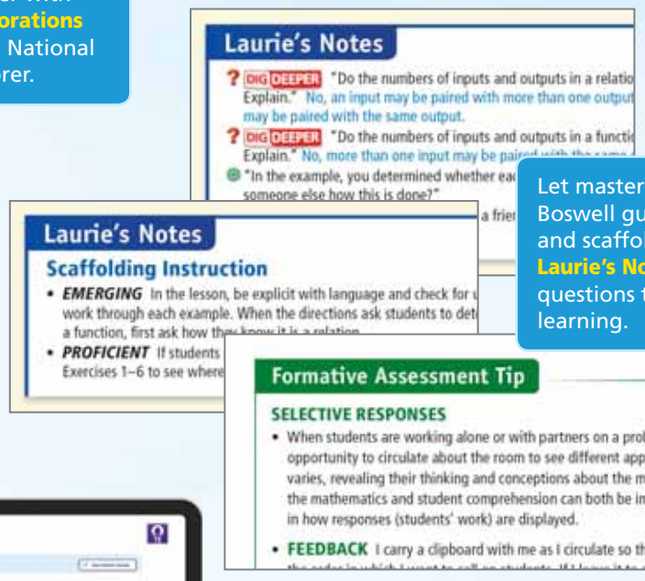
Assess Understanding

- Check for development of mathematical reasoning
- Informally assess student comprehension of concepts



How to Use This Program: Teach

Launch the chapter with an **Everyday Explorations Video** featuring a National Geographic Explorer.

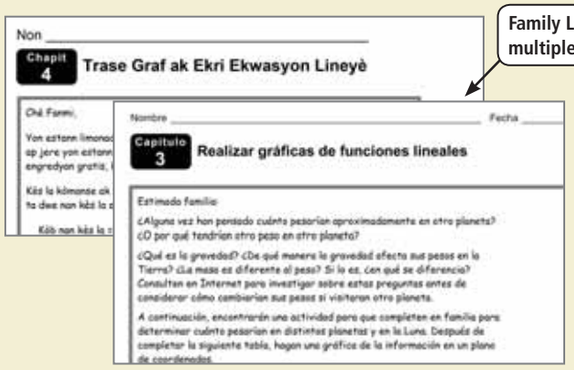


Let master educator Laurie Boswell guide your teaching and scaffolding decisions in **Laurie's Notes**. Use insightful questions to deepen students' learning.

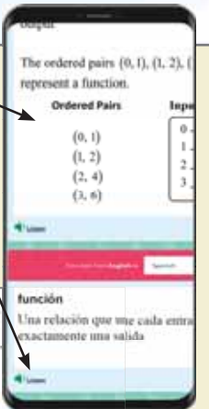
Present interactive content using the **Dynamic Classroom**, get students on task with **Flip-To**, and use **Formative Check** to collect and act on real-time student data.

SUPPORT ENGLISH LEARNERS

Big Ideas Learning supports English learners with a mix of print and digital resources.



Family Letters in multiple languages



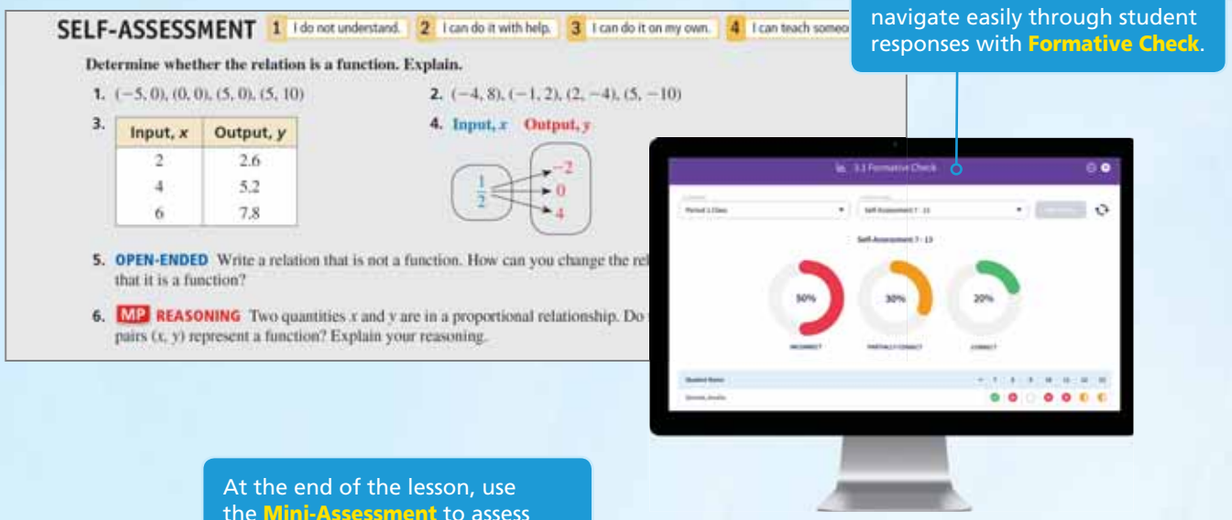
Multi-Language Glossary

Spanish audio throughout the Dynamic Student Edition and eBook

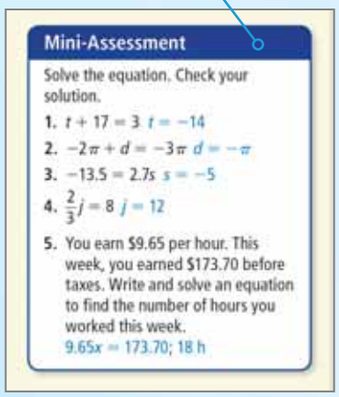
Games available in Spanish

How to Use This Program: Assess

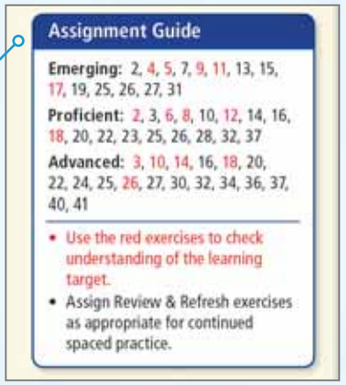
Access real-time data and navigate easily through student responses with **Formative Check**.

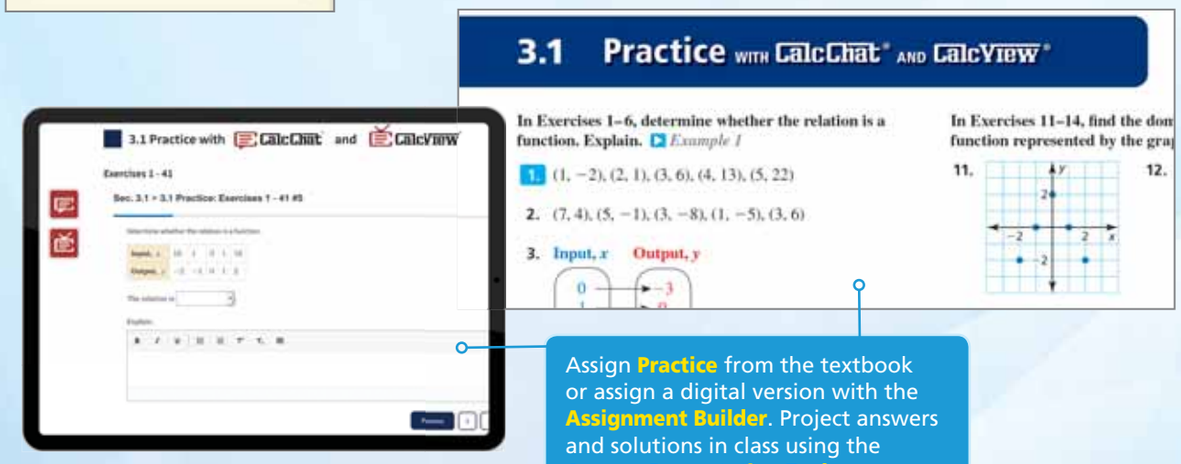


At the end of the lesson, use the **Mini-Assessment** to assess understanding of lesson concepts.



Use the **Assignment Guide** to scaffold appropriately for where students are in their learning. Each group of exercises has a variety of levels of problems.





Assign **Practice** from the textbook or assign a digital version with the **Assignment Builder**. Project answers and solutions in class using the **Answer Presentation Tool**.

Assess learning of standards throughout the year with **Course Benchmark Tests** to help plan instruction and intervention.

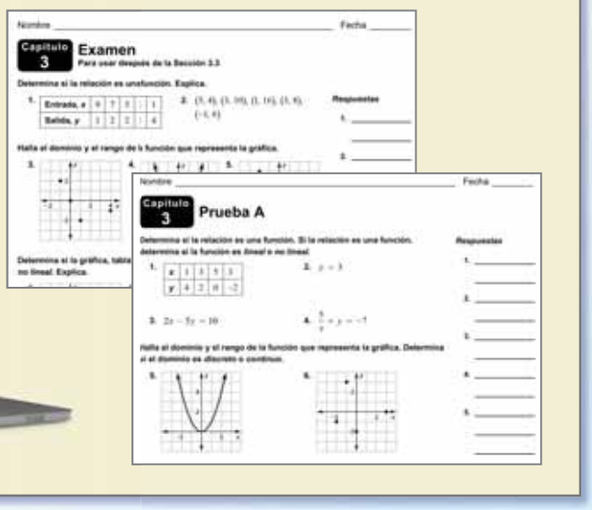
Assign **Quizzes** or **Chapter Tests** to assess understanding of chapter content, or use **Alternative Assessments** and **Performance Tasks** that include scoring rubrics.

Assess learning across grades with adaptive **Progression Benchmark Tests**.

Use the **Assignment Builder** to assign digital versions of the print **Quizzes**, **Chapter Tests**, and **Course Benchmark Tests**, or customize them to fit your needs. Receive immediate feedback through robust reporting.

ASSESS ENGLISH LEARNERS

Big Ideas Learning supports English learners with Spanish quizzes and chapter tests.



Cohesive Progressions

Domain	Algebra 1	Geometry	Algebra 2
Number and Quantity			
The Real Number System	Use properties of rational exponents, rational numbers, and irrational numbers. *Chapters 6, 9, 10*		Use properties of rational exponents. *Chapter 5*
Quantities	Reason quantitatively and use units. *Chapters 1–4, 6–9, 11*		
The Complex Number System			Perform arithmetic with complex numbers. Use complex numbers in polynomial identities and equations. *Chapters 3, 4*
Vector and Matrix Quantities			Perform operations on matrices. Use matrices to solve problems. *Chapter 12*
Algebra			
Seeing Structure in Expressions	Interpret the structure of linear, quadratic, and exponential expressions. Write equivalent expressions. *Chapters 1–3, 6–9*		Interpret the structure of polynomial and rational expressions. Write equivalent expressions. *Chapters 3–7, 10, 11*
Arithmetic with Polynomials and Rational Expressions	Perform arithmetic on linear and quadratic polynomials. Understand the relationship between zeros and factors of polynomials. *Chapters 7–9*		Perform arithmetic on polynomials beyond quadratics. Understand the relationship between zeros and factors of polynomials. *Chapters 3, 4, 7* Use polynomial identities to solve problems. *Chapters 4, 8* Rewrite rational expressions. *Chapters 4, 7*
Creating Equations	Create linear, quadratic, and exponential equations. *Chapters 1–10*		Create equations of all available types. *Chapters 1–7, 10*
Reasoning with Equations and Inequalities	Solve linear and absolute value equations and inequalities, and quadratic and exponential equations. *Chapters 1–4, 6–10* Solve linear systems of equations and inequalities, and nonlinear systems of equations. *Chapters 5, 9*		Solve polynomial, radical, exponential, logarithmic, and rational equations, and quadratic and radical inequalities. *Chapters 3–7*
Functions			
Interpreting Functions	Interpret and analyze linear, quadratic, exponential, absolute value, step, and piecewise functions. *Chapters 3–6, 8–10*		Interpret and analyze polynomial, radical, exponential, logarithmic, and rational functions. *Chapters 1–7*
Building Functions	Build linear, quadratic, and exponential models. *Chapters 4, 6, 8* Build linear, quadratic, exponential, and absolute value functions from existing functions. *Chapters 3, 6, 8, 10*		Build models from all types of functions studied. *Chapters 1–7, 11* Build polynomial, radical, exponential, logarithmic, and rational functions from existing functions. *Chapters 1, 2, 4–7, 10*

Through the Grades

Domain	Algebra 1	Geometry	Algebra 2
Functions			
Linear, Quadratic, and Exponential Models	Construct and compare linear, quadratic, and exponential models. *Chapters 3–6, 8*		Represent the solution of an exponential model using logarithms. *Chapter 6* Construct arithmetic and geometric sequences. *Chapter 11*
Trigonometric Functions			Extend the domain of trigonometric functions using the unit circle. Model with trigonometric functions. Prove and use trigonometric identities. *Chapter 10*
Geometry			
Congruence		Understand transformations and congruence, prove geometric theorems, and make constructions. *Chapters 1–11*	
Similarity, Right Triangles, and Trigonometry		Understand similarity and prove theorems involving similarity. *Chapters 4, 5, 8, 9* Use trigonometry with right triangles. *Chapter 9*	
Circles		Use theorems about circles. Find arc lengths and areas of sectors. *Chapters 10, 11*	
Expressing Geometric Properties with Equations		Translate between the geometry description and the equation for a conic section. *Chapter 10* Use coordinates to prove simple geometry theorems algebraically. *Chapters 1, 3, 5–8, 10*	
Geometric Measurement and Dimension		Understand and use volume formulas. Relate two-dimensional and three-dimensional objects. *Chapters 11, 12*	
Modeling with Geometry		Apply geometric concepts in modeling situations. *Chapters 1, 5–7, 9–12*	
Statistics and Probability			
Interpreting Categorical and Quantitative Data	Use scatter plots to find lines of fit and interpret correlation coefficients. *Chapters 4, 6, 9* Summarize, represent, and interpret data using measures of center and spread. *Chapter 11*		Use normal distributions. *Chapter 9*
Making Inferences and Justifying Conclusions			Make inferences and justify conclusions. *Chapter 9*
Conditional Probability and the Rules of Probability		Use conditional probability and find the probabilities of compound events. *Chapter 12*	Use conditional probability and find the probabilities of compound events. *Chapter 8*
Using Probability to Make Decisions		Use probability to evaluate outcomes of decisions. *Chapter 12*	Use probability to evaluate outcomes of decisions. *Chapter 8*

Common Core State Standards for Algebra 1, Geometry,

Standard	Descriptor	Algebra 1	Geometry	Algebra 2
Number and Quantity				
HSN-RN.A.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.	**6.2**		**5.1**
HSN-RN.A.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents.	**6.1**, **6.2**, 6.3, 6.4, 7.2, 7.3, **9.1**, 9.3, 10.3, 10.4		**5.1**, **5.2**
HSN-RN.B.3	Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.	**9.1**		
HSN-Q.A.1	Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.	1.1, 1.2, **1.3**, 1.4, 1.5, 1.6, 1.7, 2.1, 2.3, 2.6, 3.2, 3.3, 3.4, 4.1, 4.5, 8.1, 9.4, 11.2, 11.3, **11.5**		
HSN-Q.A.2	Define appropriate quantities for the purpose of descriptive modeling.	**1.3**, 7.1, 7.2, 7.3, 7.7, 7.8, 8.6		
HSN-Q.A.3	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.	1.2, **1.4**, 1.7, 2.3, 4.5, 6.2, 6.4, 8.3, 8.6, 9.1, 9.2, 9.3, 9.5		
HSN-CN.A.1	Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.			**3.2**
HSN-CN.A.2	Use the relation $i^2 = -1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers.			**3.2**, 3.4, 4.2, 4.6
HSN-CN.C.7	Solve quadratic equations with real coefficients that have complex solutions.			**3.1**, **3.2**, **3.3**, **3.4**, 4.6
HSN-CN.C.8	(+) Extend polynomial identities to the complex numbers.			3.2, **4.6**
HSN-CN.C.9	(+) Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.			**4.6**
HSN-VM.C.6	(+) Use matrices to represent and manipulate data, e.g., to represent payoffs or incidence relationships in a network.			**12.1**, **12.2**, **12.3**, **12.4**
HSN-VM.C.7	(+) Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled.			**12.1**, 12.2, 12.4
HSN-VM.C.8	(+) Add, subtract, and multiply matrices of appropriate dimensions.			**12.1**, **12.2**, 12.4
HSN-VM.C.9	(+) Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but still satisfies the associative and distributive properties.			**12.2**

Boldface indicates a lesson in which the standard is a primary focus.

Mathematical Content Correlated to and Algebra 2

Standard	Descriptor	Algebra 1	Geometry	Algebra 2
HSN-VM.C.10	(+) Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse.			**12.4**
HSN-VM.C.12	(+) Work with 2 x 2 matrices as transformations of the plane, and interpret the absolute value of the determinant in terms of area.			**12.3**, 12.4
Algebra				
HSA-SSE.A.1	Interpret expressions that represent a quantity in terms of its context.			
	a. Interpret parts of an expression, such as terms, factors, and coefficients.	1.2, 1.3, 1.5, 1.6, **2.1**, 2.2, 3.3, 3.5, **3.6**, 3.7, 4.4, 6.3, 6.4, **7.1**, **7.3**, 7.6, 7.7		1.3, 2.4, 3.1, 3.4, 4.2, 5.6, 6.1, 6.2, 7.3
	b. Interpret complicated expressions by viewing one or more of their parts as a single entity.	1.2, 2.5, 6.4, 7.2, 7.4		3.1, 4.5, 6.1, 6.2
HSA-SSE.A.2	Use the structure of an expression to identify ways to rewrite it.	7.2, 7.3, **7.5**, **7.6**, **7.7**, **7.8**, 8.5, 9.2, 9.4, 9.5, 9.6, 10.3		3.1, 3.2, 3.3, 3.5, 3.6, **4.4**, 4.5, 4.6, 4.8, 5.1, 5.2, 5.4, 6.1, 6.2, 6.3, **6.5**, 6.6, 6.7, 7.2, 7.3, 7.4, 7.5, 10.7, 10.8
HSA-SSE.B.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.			
	a. Factor a quadratic expression to reveal the zeros of the function it defines.	**7.4**, **7.5**, **7.6**, **7.7**, **7.8**, **8.5**, 9.5		
	b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.	**9.4**		
	c. Use the properties of exponents to transform expressions for exponential functions.	**6.4**, 6.5		
HSA-SSE.B.4	Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems.			**11.3**, **11.4**
HSA-APR.A.1	Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.	**7.1**, **7.2**, **7.3**, 7.5, 8.5, 8.6		2.1, 2.3, 3.5, **4.2**, 4.3, 4.4, 4.5, 4.6, 4.8, 5.5, 5.6, 7.3, 7.4, 7.5
HSA-APR.B.2	Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a, the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.			**4.3**, **4.4**, 4.5, 4.8
HSA-APR.B.3	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.	**7.4**, 7.5, 7.6, 7.7, 7.8, **8.5**, 9.2		2.2, 3.1, 3.6, **4.4**, **4.5**, **4.6**, **4.8**

Boldface indicates a lesson in which the standard is a primary focus.

Common Core State Standards for Algebra 1, Geometry,

Standard	Descriptor	Algebra 1	Geometry	Algebra 2
HSA-APR.C.4	Prove polynomial identities and use them to describe numerical relationships.			**4.2**
HSA-APR.C.5	(+) Know and apply the Binomial Theorem for the expansion of $(x + y)^n$ in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle.			**4.2**, **8.6**
HSA-APR.D.6	Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system.			**4.3**, **7.2**, **7.3**, **7.4**
HSA-APR.D.7	(+) Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.			**7.3**, **7.4**
HSA-CED.A.1	Create equations and inequalities in one variable and use them to solve problems.	**1.1**, **1.2**, 1.3, **1.5**, **1.6**, 1.7, **2.1**, **2.2**, **2.3**, **2.4**, **2.5**, **2.6**, 3.4, **6.5**, 7.4, 7.5, 7.6, 7.7, 7.8, 8.4, 8.5, 8.6, 9.1, 9.2, **9.3**, **9.4**, **9.5**, 9.6, 10.1, 10.2, **10.3**		1.2, 1.3, 1.4, 2.4, 3.1, 3.3, 3.4, **3.6**, 4.5, 4.6, 4.9, 5.1, 5.3, 5.4, 6.1, 6.2, 6.6, 6.7, **7.1**, 7.3, 7.5, 10.1
HSA-CED.A.2	Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	3.1, 3.3, **3.4**, **3.5**, **3.6**, **3.7**, **3.8**, **4.1**, **4.2**, **4.3**, 4.4, 4.5, 4.6, **4.7**, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, **6.3**, **6.4**, 6.5, 6.6, 6.7, **8.1**, **8.2**, **8.3**, **8.4**, **8.5**, 8.6, 9.2, 9.5, **10.1**, **10.2**, 10.3, 10.4		1.1, 1.2, **1.3**, 1.4, 2.1, 2.3, **2.4**, 3.1, 3.4, 3.6, 4.5, 4.6, 4.7, **4.9**, 5.3, 5.5, 5.6, 5.7, 6.1, 6.2, 6.3, 6.4, **6.7**, **7.1**, 7.2, 7.3, 7.4, 7.5, 10.5, **10.6**
HSA-CED.A.3	Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context.	**5.1**, **5.2**, **5.3**, **5.4**, **5.5**, **5.6**, **5.7**, 7.5, 7.6, 7.7, 7.8, 8.4, 9.3, 9.4, 9.5		1.3, **1.4**, 3.1, 3.3, 3.4, 3.5, **3.6**, 4.6, 6.6, 7.1, 7.2
HSA-CED.A.4	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.	**1.7**, **9.3**, 9.5, 10.4		1.3, 4.8, 5.2, 5.3, 5.4, **5.7**, 7.1, 7.5
HSA-REI.A.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	**1.1**, **1.2**, 1.3, **1.5**, **1.6**, 1.7, 3.4, 3.5, 4.6, 4.7, 5.2, 5.3, 5.4, **6.5**, 6.6, **7.4**, 7.5, 7.6, 7.7, 7.8, 8.4, 8.5, 8.6, 9.1, 9.3, 9.4, 9.5, 9.6, 10.3		
HSA-REI.A.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.			**5.4**, **7.5**

Boldface indicates a lesson in which the standard is a primary focus.

Mathematical Content Correlated to and Algebra 2 (continued)

Standard	Descriptor	Algebra 1	Geometry	Algebra 2
HSA-REI.B.3	Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	**1.1**, **1.2**, 1.3, **1.5**, **1.6**, 1.7, **2.2**, **2.3**, **2.4**, **2.5**, **2.6**, 3.4, 3.5, 4.3, 4.7, 5.2, 5.3, 5.4, 7.4, 7.5, 7.6, 8.4, 8.5, 8.6, 9.1, 9.6, 10.1, 10.3		
HSA-REI.B.4	Solve quadratic equations in one variable.			
	a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.	**9.4**, **9.5**		
	b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b.	**7.4**, 7.5, 7.6, 7.7, 7.8, 9.2, **9.3**, **9.4**, **9.5**, 9.6, 10.3		
HSA-REI.C.5	Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	**5.3**		
HSA-REI.C.6	Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	**5.1**, **5.2**, **5.3**, **5.4**, 5.5		
HSA-REI.C.7	Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.	**9.6**		
HSA-REI.C.8	(+) Represent a system of linear equations as a single matrix equation in a vector variable.			**12.4**
HSA-REI.C.9	(+) Find the inverse of a matrix if it exists and use it to solve systems of linear equations (using technology for matrices of dimension 3 x 3 or greater).			**12.4**
HSA-REI.D.10	Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	**3.3**, 3.8, 4.7, 6.3, 8.1, 10.1, 10.2		
HSA-REI.D.11	Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.	**5.5**, **6.5**, 6.6, 8.6, 9.2, 9.3, 9.5, **9.6**, 10.2, 10.3		1.3, 3.4, **3.5**, 3.6, 4.5, 5.4, 6.6, 7.5, 10.8
HSA-REI.D.12	Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	**5.6**, **5.7**		

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Common Core State Standards for Algebra 1, Geometry,

Standard	Descriptor	Algebra 1	Geometry	Algebra 2
Functions				
HSF-IF.A.1	Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If *f* is a function and *x* is an element of its domain, then *f*(*x*) denotes the output of *f* corresponding to the input *x*. The graph of *f* is the graph of the equation $y = f(x)$.	**3.1**, 3.2, 3.3, **3.4**, 3.6, 3.7, 3.8, 4.1, 4.2, 4.6, 4.7, 6.3, 6.4, 6.6, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 10.1, 10.2		
HSF-IF.A.2	Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	**3.4**, 3.6, 3.7, 3.8, 4.1, 4.2, 4.6, 4.7, 6.3, 6.4, 6.6, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 9.2, 9.4, 9.6, 10.1, 10.2, 10.4		
HSF-IF.A.3	Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.	**4.6**, **6.6**, **6.7**		**11.1**, **11.2**, **11.3**, **11.5**
HSF-IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.	**3.2**, 3.3, 3.4, 3.5, **3.6**, 3.8, 4.1, 4.4, 4.7, 6.3, 6.4, **8.1**, 8.2, **8.3**, **8.4**, 8.5, 8.6, **9.2**, 9.4, 9.5, 10.1, 10.2		1.3, **2.2**, **2.3**, 2.4, 3.1, **4.1**, 4.5, 4.6, **4.8**, 4.9, 5.5, 6.1, 6.2, 6.3, 7.2, 10.4, 10.5, 10.6, 11.4, 11.5
HSF-IF.B.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.	3.1, **3.3**, 3.4, 3.5, 3.6, 3.7, 3.8, 4.7, 5.1, 5.4, 5.6, 6.3, 8.1, 8.2, 8.3, 8.4, 8.5, 10.4		**1.1**, 1.3, 2.1, 2.2, 2.3, 2.4, 3.3, 3.6, 4.1, 4.6, 5.3, 5.5, 5.6, 5.7, 6.1, 6.3, 6.4, 7.2, 10.4, 10.5
HSF-IF.B.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.	**8.6**, **10.1**, **10.2**		1.3, **2.4**, 3.4, 4.1, 5.3, 6.1, 6.2, 6.3, 7.2, 10.4, 10.5
HSF-IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.			
	a. Graph linear and quadratic functions and show intercepts, maxima, and minima.	3.3, **3.4**, **3.5**, **3.6**, **3.7**, 4.3, 4.5, 4.6, 4.7, 5.1, 5.2, 5.4, 5.5, 5.6, 5.7, 6.5, **8.1**, **8.2**, **8.3**, **8.4**, **8.5**, 8.6, **9.2**, 9.3, 9.4, 9.5, 9.6, 10.4		
	b. Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.	**3.8**, **4.7**, 6.4, **10.1**, **10.2**, 10.3, 10.4		**1.1**, **1.2**, **5.3**, 5.4, 5.5, 5.7
	c. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.			**2.1**, **2.2**, **2.3**, 3.1, 3.3, 3.4, 3.5, 3.6, **4.1**, 4.5, 4.6, **4.7**, **4.8**, 4.9, 5.7
	e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.	**6.3**, **6.4**, 6.5, 6.6, 8.6, 9.6		**6.1**, **6.2**, **6.3**, **6.4**, 6.6, 6.7, **10.4**, **10.5**

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Mathematical Content Correlated to and Algebra 2 (continued)

Standard	Descriptor	Algebra 1	Geometry	Algebra 2
HSF-IF.C.8	Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.			**3.1**, **3.3**, 4.5, 4.6, 5.3, 6.2, 7.2, 7.4
	a. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.	**8.5**, **9.4**		
	b. Use the properties of exponents to interpret expressions for exponential functions.	**6.4**		**6.1**, 6.7
HSF-IF.C.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	**3.2**, 3.3, **3.4**, 3.6, 4.2, 6.3, 8.1, **8.3**, **8.6**, **10.1**, **10.2**		**1.3**, **2.2**, 5.3, 6.1, 6.2, 6.3, 7.2, 10.5, 10.6
HSF-BF.A.1	Write a function that describes a relationship between two quantities.			
	a. Determine an explicit expression, a recursive process, or steps for calculation from a context.	3.1, **4.1**, **4.2**, 4.4, 4.5, **4.6**, **6.3**, **6.4**, **6.6**, **6.7**, **8.4**, **8.5**, **8.6**, 9.2, 10.4		
	b. Combine standard function types using arithmetic operations.	**6.4**, **8.2**		**5.5**, 6.6, 7.3
	c. (+) Compose functions.			**5.6**
HSF-BF.A.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.	**4.6**, **6.6**, **6.7**		**11.2**, **11.3**, **11.5**
HSF-BF.B.3	Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $kf(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.	**3.7**, **3.8**, 4.1, 4.2, 4.3, 6.3, 6.4, **8.1**, **8.2**, 8.3, **8.4**, **10.1**, **10.2**		**1.1**, **1.2**, **2.1**, 2.3, **4.7**, **4.8**, **5.3**, **6.4**, **7.2**, 7.4, **10.4**, **10.5**, 10.7
HSF-BF.B.4	Find inverse functions.			
	a. Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse.	**10.4**		**5.7**, **6.3**, 7.5
HSF-LE.A.1	Distinguish between situations that can be modeled with linear functions and with exponential functions.			
	a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.	**3.6**, **6.3**		
	b. Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.	**3.3**, **4.1**, **4.2**, 6.7, 8.6		
	c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.	6.3, **6.4**, 6.7, 8.6		

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Common Core State Standards for Algebra 1, Geometry,

Standard	Descriptor	Algebra 1	Geometry	Algebra 2
HSF-LE.A.2	Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	3.1, **4.1**, **4.2**, **4.3**, 4.4, 4.5, **4.6**, 4.7, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, **6.3**, **6.4**, 6.5, **6.6**, **6.7**, 8.6		**11.2**, **11.3**
HSF-LE.A.3	Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.	**8.6**		
HSF-LE.A.4	For exponential models, express as a logarithm the solution to $ab^{ct} = d$ where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm using technology.			**6.3**, **6.5**, **6.6**
HSF-LE.B.5	Interpret the parameters in a linear or exponential function in terms of a context.	**3.6**, **4.4**, **4.5**, 6.3, 6.4		
HSF-TF.A.1	Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.			10.1, **10.2**, 10.3, 10.4, 10.5
HSF-TF.A.2	Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.			10.1, **10.3**, 10.4, 10.5
HSF-TF.B.5	Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.			10.1, **10.6**
HSF-TF.C.8	Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle.			10.1, **10.7**
HSF-TF.C.9	(+) Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.			**10.8**
Geometry				
HSG-CO.A.1	Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.		**1.1**, **1.2**, 1.3, 1.4, **1.5**, **1.6**, **2.1**, 2.3, 2.4, 2.5, 2.6, **3.1**, 3.2, 3.3, 3.4, 3.5, 4.4, 4.5, **10.1**, 11.1	
HSG-CO.A.2	Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).		**4.1**, **4.2**, **4.3**, 4.4, **4.5**, 4.6	
HSG-CO.A.3	Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.		**4.2**, **4.3**	
HSG-CO.A.4	Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.		**4.1**, **4.2**, **4.3**	

Boldface indicates a lesson in which the standard is a primary focus.

Mathematical Content Correlated to and Algebra 2 (continued)

Standard	Descriptor	Algebra 1	Geometry	Algebra 2
HSG-CO.A.5	Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.		**4.1**, **4.2**, **4.3**, **4.4**, **4.6**, 5.2, 5.3, 5.5, 5.6	
HSG-CO.B.6	Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.		**4.1**, **4.2**, **4.3**, **4.4**	
HSG-CO.B.7	Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.		**5.2**	
HSG-CO.B.8	Explain how the criteria for triangle congruence (ASA, SAS, and SSS) follow from the definition of congruence in terms of rigid motions.		**5.3**, **5.5**, **5.6**	
HSG-CO.C.9	Prove theorems about lines and angles. *Theorems include: vertical angles are congruent; when a transversal crosses parallel lines, alternate interior angles are congruent and corresponding angles are congruent; points on a perpendicular bisector of a line segment are exactly those equidistant from the segment's endpoints.*		2.1, 2.2, 2.3, 2.4, **2.5**, **2.6**, **3.2**, **3.3**, **3.4**, 4.1, 4.4, **6.1**, 8.4	
HSG-CO.C.10	Prove theorems about triangles. *Theorems include: measures of interior angles of a triangle sum to 180°; base angles of isosceles triangles are congruent; the segment joining midpoints of two sides of a triangle is parallel to the third side and half the length; the medians of a triangle meet at a point.*		2.1, 2.2, 2.3, 2.4, **5.1**, 5.2, **5.4**, **6.2**, **6.3**, **6.4**, **6.5**, **6.6**	
HSG-CO.C.11	Prove theorems about parallelograms. *Theorems include: opposite sides are congruent, opposite angles are congruent, the diagonals of a parallelogram bisect each other, and conversely, rectangles are parallelograms with congruent diagonals.*		2.1, 2.2, 2.3, 2.4, 7.1, **7.2**, **7.3**, **7.4**	
HSG-CO.D.12	Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). *Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.*		**1.2**, **1.3**, **1.5**, 1.6, 3.2, **3.3**, **3.4**, 4.3, 4.4, 4.5, 5.3, 5.4, 5.5, 5.6, 6.1, 6.2, 6.3, 6.4, 6.6, 7.2, 7.3, 7.4, 7.5, 8.1, 8.2, 8.4, 9.2, 9.4, 9.5, 10.1, 10.3, 10.4, 10.5, 10.6, 11.3	
HSG-CO.D.13	Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.		3.4, 5.4, **10.4**	

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Common Core State Standards for Algebra 1, Geometry,

Standard	Descriptor	Algebra 1	Geometry	Algebra 2
HSG-SRT.A.1	Verify experimentally the properties of dilations given by a center and a scale factor:			
	a. A dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.		**4.5**, 4.6	
	b. The dilation of a line segment is longer or shorter in the ratio given by the scale factor.		**4.5**, 4.6	
HSG-SRT.A.2	Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides.		**4.6**, **8.1**, 8.2, 8.3, 10.2	
HSG-SRT.A.3	Use the properties of similarity transformations to establish the AA criterion for two triangles to be similar.		**8.2**	
HSG-SRT.B.4	Prove theorems about triangles. *Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity.*		2.1, 2.2, 2.3, 2.4, 8.2, 8.3, **8.4**, **9.1**, **9.2**, 9.3, 9.7	
HSG-SRT.B.5	Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.		5.2, 5.3, 5.4, 5.5, 5.6, **5.7**, 5.8, 6.1, 6.3, 6.6, 7.2, 7.3, 7.4, 7.5, **8.1**, **8.2**, **8.3**, **8.4**, 9.1, **9.3**, 9.4, 9.5, 10.3, 10.5	
HSG-SRT.C.6	Understand that by similarity, side ratios in right triangles are properties of the angles in the triangle, leading to definitions of trigonometric ratios for acute angles.		**9.4**, **9.5**	
HSG-SRT.C.7	Explain and use the relationship between the sine and cosine of complementary angles.		**9.5**	
HSG-SRT.C.8	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.		**9.1**, **9.4**, **9.5**, **9.6**	
HSG-SRT.D.9	(+) Derive the formula $A = (1/2)ab\sin(C)$ for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.		**9.7**	
HSG-SRT.D.10	(+) Prove the Laws of Sines and Cosines and use them to solve problems.		**9.7**	
HSG-SRT.D.11	(+) Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).		**9.7**	
HSG-C.A.1	Prove that all circles are similar.		**10.2**	
HSG-C.A.2	Identify and describe relationships among inscribed angles, radii, and chords. *Include the relationship between central, inscribed, and circumscribed angles; inscribed angles on a diameter are right angles; the radius of a circle is perpendicular to the tangent where the radius intersects the circle.*		**10.1**, **10.3**, **10.4**, **10.5**, **10.6**	

Boldface indicates a lesson in which the standard is a primary focus.

Mathematical Content Correlated to and Algebra 2 (continued)

Standard	Descriptor	Algebra 1	Geometry	Algebra 2
HSG-C.A.3	Construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle.		**6.2**, **10.4**	
HSG-C.A.4	(+) Construct a tangent line from a point outside a given circle to the circle.		**10.1**	
HSG-C.B.5	Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.		**11.1**, **11.2**	
HSG-GPE.A.1	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.		**10.7**	
HSG-GPE.A.2	Derive the equation of a parabola given a focus and directrix.		**10.8**	
HSG-GPE.B.4	Use coordinates to prove simple geometric theorems algebraically.		**5.8**, 6.4, 7.3, 7.4, **7.5**, 10.2, **10.7**	
HSG-GPE.B.5	Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).		**3.5**, 5.1, 6.1, 6.3, 6.4, 7.2, 7.3, 7.4, 7.5, **8.3**	
HSG-GPE.B.6	Find the point on a directed line segment between two given points that partitions the segment in a given ratio.		**3.5**, **8.4**	
HSG-GPE.B.7	Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.		**1.4**	
HSG-GMD.A.1	Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. *Use dissection arguments, Cavalieri's principle, and informal limit arguments.*		**11.1**, **11.2**, **12.2**, **12.3**, **12.4**	
HSG-GMD.A.3	Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.		11.3, **12.2**, **12.3**, **12.4**, **12.5**, 12.6, 12.7	
HSG-GMD.B.4	Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.		**12.1**, **12.7**	
HSG-MG.A.1	Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).		**1.4**, 1.6, 3.2, 5.1, 5.4, 5.5, 5.7, 6.1, 6.2, 6.4, 7.1, 7.3, 7.5, 9.6, 10.6, **11.4**, 12.3, 12.5, **12.6**	
HSG-MG.A.2	Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot).		**11.4**, **12.6**	
HSG-MG.A.3	Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).		5.5, 6.2, 9.6, 10.3, **11.4**, 12.2	

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Common Core State Standards for Algebra 1, Geometry,

Standard	Descriptor	Algebra 1	Geometry	Algebra 2
Statistics and Probability				
HSS-ID.A.1	Represent data with plots on the real number line (dot plots, histograms, and box plots).	11.1, **11.2**, **11.3**, **11.5**		
HSS-ID.A.2	Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.	**11.3**		
HSS-ID.A.3	Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).	**11.1**, **11.2**, **11.3**		
HSS-ID.A.4	Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.			**9.1**
HSS-ID.B.5	Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.	**11.4**		
HSS-ID.B.6	Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.	3.3		
	a. Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.	**4.4**, **4.5**, **6.3**, **9.2**		
	b. Informally assess the fit of a function by plotting and analyzing residuals.	**4.5**		
	c. Fit a linear function for a scatter plot that suggests a linear association.	**4.4**, **4.5**		
HSS-ID.C.7	Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.	**4.4**, **4.5**		
HSS-ID.C.8	Compute (using technology) and interpret the correlation coefficient of a linear fit.	**4.5**		
HSS-ID.C.9	Distinguish between correlation and causation.	**4.5**		
HSS-IC.A.1	Understand statistics as a process for making inferences about population parameters based on a random sample from that population.			**9.2**, **9.3**, **9.4**, 9.5, 9.6
HSS-IC.A.2	Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation.			**9.2**, **9.5**, **9.6**
HSS-IC.B.3	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.			**9.3**, **9.4**
HSS-IC.B.4	Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.			**9.5**

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Mathematical Content Correlated to and Algebra 2 (continued)

Standard	Descriptor	Algebra 1	Geometry	Algebra 2
HSS-IC.B.5	Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.			**9.6**
HSS-IC.B.6	Evaluate reports based on data.			**9.4**, 9.5, 9.6
HSS-CP.A.1	Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").		**13.1**, 13.3, 13.4, **13.5**	**8.1**, 8.3, 8.4, **8.5**
HSS-CP.A.2	Understand that two events *A* and *B* are independent if the probability of *A* and *B* occurring together is the product of their probabilities, and use this characterization to determine if they are independent.		**13.4**	**8.4**
HSS-CP.A.3	Understand the conditional probability of *A* given *B* as $P(A \text{ and } B)/P(B)$, and interpret independence of *A* and *B* as saying that the conditional probability of *A* given *B* is the same as the probability of *A*, and the conditional probability of *B* given *A* is the same as the probability of *B*.		**13.3**, **13.4**, 13.5	**8.3**, **8.4**, 8.5
HSS-CP.A.4	Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.		**13.2**, **13.3**, **13.4**	**8.2**, **8.3**, **8.4**
HSS-CP.A.5	Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.		**13.4**	**8.4**
HSS-CP.B.6	Find the conditional probability of *A* given *B* as the fraction of *B*'s outcomes that also belong to *A*, and interpret the answer in terms of the model.		**13.3**, 13.4	**8.3**, 8.4
HSS-CP.B.7	Apply the Addition Rule, $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$, and interpret the answer in terms of the model.		**13.5**, 13.7	**8.5**, 8.7
HSS-CP.B.8	(+) Apply the general Multiplication Rule in a uniform probability model, $P(A \text{ and } B) = P(A)P(B\|A) = P(B)P(A\|B)$, and interpret the answer in terms of the model.		**13.4**, 13.5	**8.4**, 8.5
HSS-CP.B.9	(+) Use permutations and combinations to compute probabilities of compound events and solve problems.		**13.6**, **13.7**	**8.6**, **8.7**
HSS-MD.B.6	(+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).		13.3, 13.4, 13.5	8.3, 8.4, 8.5, 9.1, 9.2, 9.5, 9.6
HSS-MD.B.7	(+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).		13.3, 13.4, 13.5	8.3, 8.4, 8.5, 9.1

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Suggested Pacing Guide

Chapters 1–11 **151 Days**

Chapter 1 (14 Days)

Chapter Opener	1 Day
Section 1	2 Days
Section 2	2 Days
Section 3	1 Day
Section 4	1 Day
Section 5	1 Day
Section 6	2 Days
Section 7	2 Days
Chapter Review	1 Day
Chapter Test/Performance Task	1 Day
Year-To-Date	**14 Days**

Chapter 2 (10 Days)

Chapter Opener	1 Day
Section 1	2 Days
Section 2	1 Day
Section 3	1 Day
Section 4	1 Day
Section 5	1 Day
Section 6	1 Day
Chapter Review	1 Day
Chapter Test/Performance Task	1 Day
Year-To-Date	**24 Days**

Chapter 3 (19 Days)

Chapter Opener	1 Day
Section 1	2 Days
Section 2	1 Day
Section 3	3 Days
Section 4	1 Day
Section 5	1 Day
Section 6	3 Days
Section 7	3 Days
Section 8	2 Days
Chapter Review	1 Day
Chapter Test/Performance Task	1 Day
Year-To-Date	**43 Days**

Chapter 4 (13 Days)

Chapter Opener	1 Day
Section 1	1 Day
Section 2	1 Day
Section 3	1 Day
Section 4	1 Day
Section 5	2 Days
Section 6	2 Days
Section 7	2 Days
Chapter Review	1 Day
Chapter Test/Performance Task	1 Day
Year-To-Date	**56 Days**

Chapter 5 (11 Days)

Chapter Opener	1 Day
Section 1	1 Day
Section 2	1 Day
Section 3	1 Day
Section 4	1 Day
Section 5	1 Day
Section 6	1 Day
Section 7	2 Days
Chapter Review	1 Day
Chapter Test/Performance Task	1 Day
Year-To-Date	**67 Days**

Chapter 6 (17 Days)

Chapter Opener	1 Day
Section 1	2 Days
Section 2	1 Day
Section 3	3 Days
Section 4	3 Days
Section 5	1 Day
Section 6	2 Days
Section 7	2 Days
Chapter Review	1 Day
Chapter Test/Performance Task	1 Day
Year-To-Date	**84 Days**

Chapter 7 (13 Days)

Chapter Opener	1 Day
Section 1	2 Days
Section 2	2 Days
Section 3	1 Day
Section 4	1 Day
Section 5	1 Day
Section 6	1 Day
Section 7	1 Day
Section 8	1 Day
Chapter Review	1 Day
Chapter Test/Performance Task	1 Day
Year-To-Date	**97 Days**

Chapter 8 (15 Days)

Chapter Opener	1 Day
Section 1	1 Day
Section 2	1 Day
Section 3	2 Days
Section 4	2 Days
Section 5	3 Days
Section 6	3 Days
Chapter Review	1 Day
Chapter Test/Performance Task	1 Day
Year-To-Date	**112 Days**

Chapter 9 (18 Days)

Chapter Opener	1 Day
Section 1	3 Days
Section 2	3 Days
Section 3	1 Day
Section 4	3 Days
Section 5	3 Days
Section 6	2 Days
Chapter Review	1 Day
Chapter Test/Performance Task	1 Day
Year-To-Date	**130 Days**

Chapter 10 (10 Days)

Chapter Opener	1 Day
Section 1	2 Days
Section 2	1 Day
Section 3	2 Days
Section 4	2 Days
Chapter Review	1 Day
Chapter Test/Performance Task	1 Day
Year-To-Date	**140 Days**

Chapter 11 (11 Days)

Chapter Opener	1 Day
Section 1	2 Days
Section 2	1 Day
Section 3	2 Days
Section 4	2 Days
Section 5	1 Day
Chapter Review	1 Day
Chapter Test/Performance Task	1 Day
Year-To-Date	**151 Days**

An editable version of the Pacing Guide is available in two forms (regular and block scheduling) at *BigIdeasMath.com*.

Meeting the Needs of All Learners

Universal Design for Learning

This robust, innovative program utilizes a mixture of print and digital resources that allow for a variety of instructional approaches. The Universal Design incorporates hands-on activities, interactive explorations, videos, scaffolded instruction, learning support, and many more resources that appeal to students and teachers alike.

PRINT

Student Edition

Teaching Edition

Resources by Chapter

- Family Letter
- Warm-Ups
- Extra Practice
- Reteach
- Enrichment and Extension
- Puzzle Time

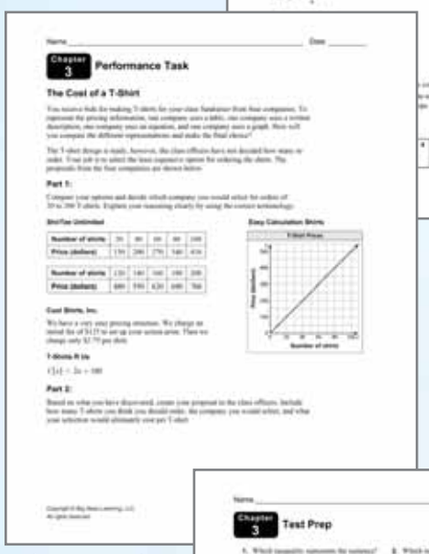
Assessment Book

- Prerequisite Skills Practice
- Pre-Course Test
- Quizzes
- Chapter Tests
- Course Benchmark Tests
- Alternative Assessments
- Performance Tasks
- Post-Course Test

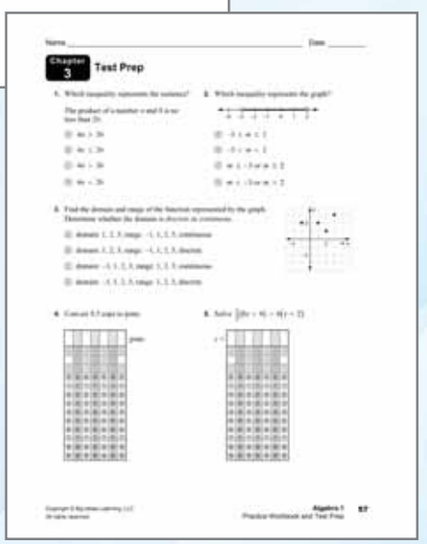
Practice Workbook and Test Prep

- Extra Practice
- Review & Refresh
- Self-Assessments
- Test Prep

Puzzle Time



Performance Task



Test Prep

Through Program Resources

DIGITAL

Dynamic Student Edition

- Interactive Explorations
- Digital Examples
- Digital Practice
- Self-Assessments
- Performance Tasks
- Everyday Explorations Videos
- Interactive Tools
- Lesson Tutorial Videos

Resources

- Additional Proofs
- Additional Topics and Lessons
- Answer Presentation Tool
- CalcChat® and CalcView®
- Chapter at a Glance
- Complete Materials List
- Differentiating the Lesson
- Everyday Connections Videos
- Everyday Explorations Videos
- Family Letters
- Game Library
- Graphic Organizers
- Homework App
- Lesson Plans
- Math Tool Paper
- Multi-Language Glossary
- Pacing Guides
- Skills Review Handbook
- Skills Trainer
- STEM Videos and Performance Tasks
- Tutorial Video Series
- Vocabulary Flash Cards
- Worked-Out Solutions Key

Dynamic Classroom

- Laurie's Notes
- Digital Warm-Ups and Closures
- Interactive Explorations
- Digital Examples with PowerPoints
- Flip-To
- Formative Check

Dynamic Assessment System

- Practice
- Assessments
- College and Career Readiness
- Progression Benchmark Tests
- District Assessments

1 Solving Linear Equations

Water Conservation
Make a plan to conserve water in your own daily life.

Solving Linear Inequalities

2

Mountaineering

Assume the role of an expedition leader and use inequalities to track the progress of climbers on Mount Everest.

3 Graphing Linear Functions

Scuba Diving

Plan a dive by selecting a tank size, depth, and the amount of time you will spend underwater.

Writing Linear Functions

4

Renewable Energy

Write a proposal for a new wind farm in your community, detailing the size, cost, and energy production of the farm.

5 Solving Systems of Linear Equations

Deep Ocean Exploration

Plan an expedition to the Challenger Deep, including a dive schedule and goals that you hope to accomplish.

6 Exponential Functions and Sequences

Bacterial and Viral Growth

Write a report for a health organization, forecasting the spread of an Ebola epidemic and recommending steps that can be taken to slow its spread.

7 Polynomial Equations and Factoring

Astronomy

Create a display that demonstrates how gravity affects objects on each planet in our solar system.

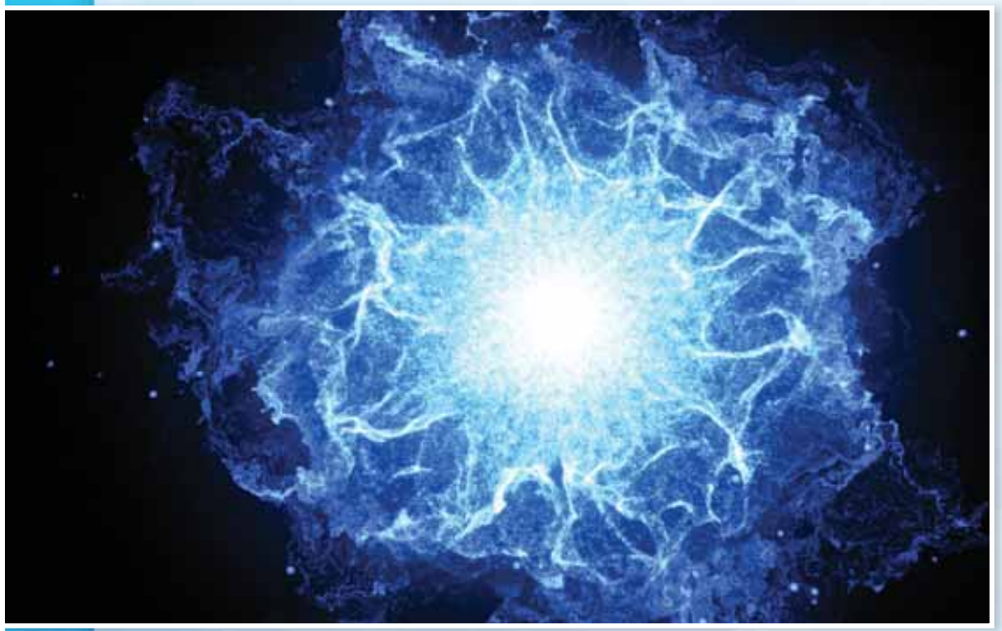
Graphing Quadratic Functions

8

Wildlife Conservation

Analyze sea turtle nesting trends in a region. Write a report that includes methods to increase the population.

9 Solving Quadratic Equations



Cosmology

Use a quadratic equation to show the relationship among a star's *luminosity*, *apparent brightness*, and distance from Earth.

10 Radical Functions and Equations

Marine Conservation

Write a report that describes the *recovery* and *reassembly* of a damaged coral reef.

11 Data Analysis and Displays

Robotics

Conduct a survey about the use of robotics in everyday life, analyze the data, and use data displays to create a presentation of your findings.

Additional Resources

For additional topics that you can teach, see *BigIdeasMath.com*.