HMH | into AGA™

Program Overview

ALGEBRA 1, GEOMETRY, AND ALGEBRA 2

Power

Student Growth

Imagine a math classroom filled with students who are ready to tackle any problem, supported by a teacher who has the tools and instructional techniques needed to ensure success. *Into AGA*® uses a growth mindset approach to learning for students and real feedback from teachers to drive growth for each and every learner.

Into AGA is part of the HMH® connected teaching experience, which brings together assessment, instruction, and professional learning into one seamless and streamlined system.

Explore what makes the *Into AGA* experience the comprehensive, total solution needed to accelerate growth and make students unstoppable in the classroom.

HMH | into AGA™

Into AGA was built to ensure growth for each and every student.

The journey toward a true depth of understanding and a culture of growth in every mathematics classroom becomes an achievable reality with *Into AGA*.

What's Inside

Connected Teaching and Learning

The world has changed. And we know that you are now being challenged to deliver the same quality instruction whether you are in a classroom or are delivering that instruction through remote learning.

We have been listening to you, and we understand you want a partner who delivers quality instruction, supports social and emotional learning, and allows you to pivot and provide distance learning as needed while still keeping a strong sense of your school community.

Our goal at HMH is simple. It is to support you the teacher in your goals and the inspirational work you do to create an unstoppable math classroom within and beyond its walls.

Foster a Culture of Growth

Build a learning culture where all embrace learning mathematics by using the research and support of Mindset Works® and social-emotional learning, combined with powerful data analytics and dynamic teacher supports.

Create Fearless Problem Solvers

Intentionally designed lessons and high-quality mathematical tasks help students develop productive perseverance in problem solving and apply knowledge to higher-level mathematics and beyond.

Invest in You

Embedded tools and technology ensure you have the time you need to focus on facilitating the mathematical discourse and differentiated instruction required to support students in reaching proficiency.

Streamline Your Teaching

HMH Connected Teaching and Learning provides an intuitive user experience where easy-to-administer assessments, flexible core instruction, personalized supplemental practice and intervention, and meaningful professional learning are connected to empower teaching and learning—all on a single learning platform.

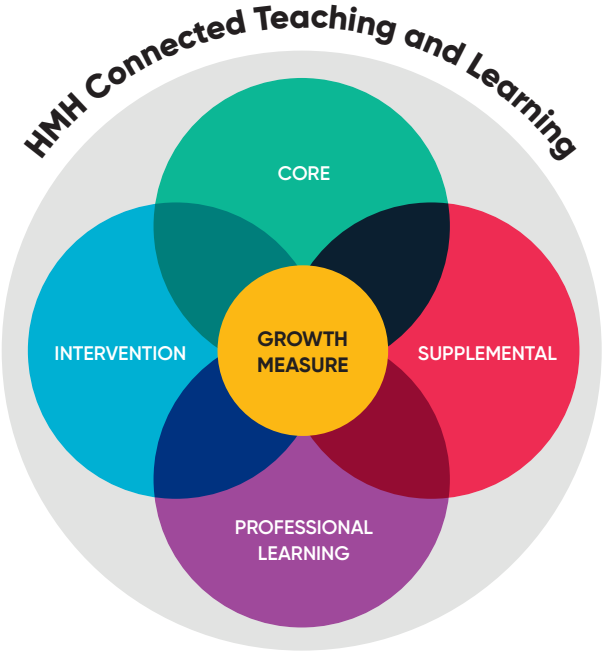
Growth Measure
Single growth measure supports differentiation and benchmarking to drive placement, grouping, and targeted instruction.

Core
Best-in-class digital-first approach enables both in classroom and remote learning.

Supplemental
Flexible solutions address the diverse skills of all learners.

Professional Learning
On-demand and live online resources give educators point-of-use support for class, community, and caregivers.

Intervention
Adaptive, digital solutions for intervention, prevention, and acceleration towards grade level proficiency.



BUILD

- A Love of Mathematics
- Academic Vocabulary
- Mathematical Modeling
- Conceptual Understanding, Procedural Fluency, Application

ENGAGE

- STEM Connections
- Student Choice
- Independent Practice

TRANSFORM

- Perseverance in Problem Solving
- Resilience
- Social and Emotional Learning

SPARK

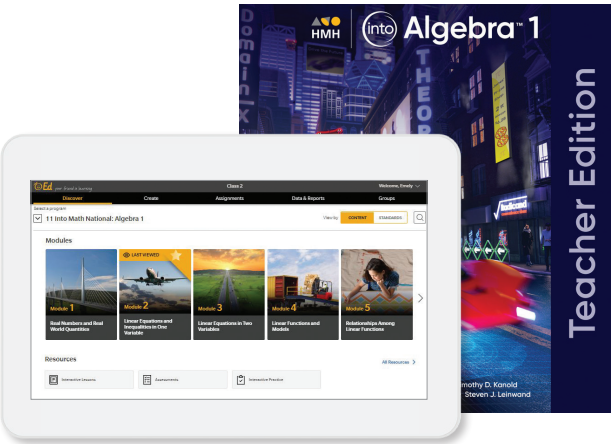
- Data-Driven Instruction
- Differentiated Support for All Learners
- Continuous, Connected Learning

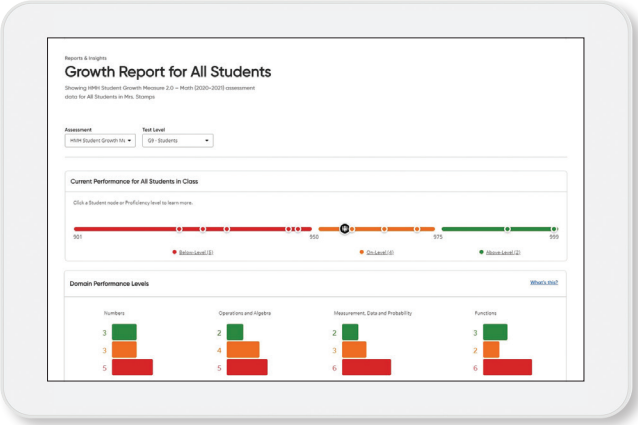
Connect Your Assessment, Instruction, **and Professional Learning**

With HMH's *Into AGA* you and your school will have access to rich content and standards-based instruction assessments with actionable data insights, professional learning, and supplemental practice and instruction—all connected on *Ed*®, the HMH learning platform.

With these tools and professional services all within one seamless experience, we can ensure you that your students will not only reach their instructional goals, but exceed them.

Comprehensive Mathematics Program for High School



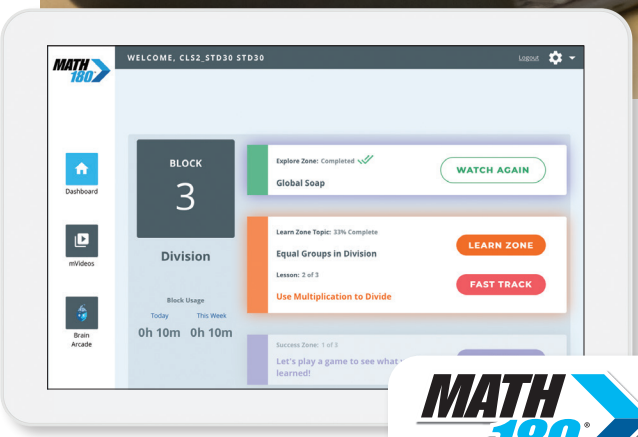


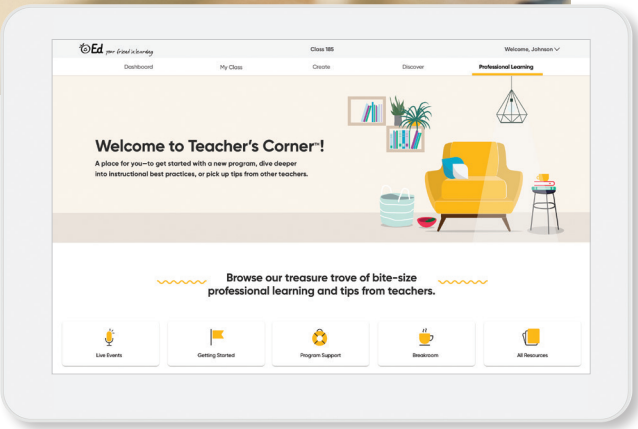
Rich Content and Standards-Based Instruction

- Research-based, explicit, systematic instruction
- Resources and support for whole-class, small-group, and independent work
- Materials for English learners and advanced learners

Assessments and Actionable Data Insights

- Embedded formative assessments
- Growth Measure reports that inform instructional decisions, planning, and grouping
- Ongoing progress monitoring





Intensive Intervention

- Developed for Tier II and III students in Grades 5-12 who are two or more years behind grade-level proficiency
- Focused on deep understanding and mastery of the essential skills and concepts necessary to unlock advanced mathematics
- Personalized instruction with an accelerated path to algebra
- Growth Mindset integration for motivation and advancement

Professional Learning

- Implementation support: Getting Started for every teacher
- Teacher's Corner™: curated, on-demand curriculum-aligned content and teaching support
- Online team coaching tailored to your learning needs

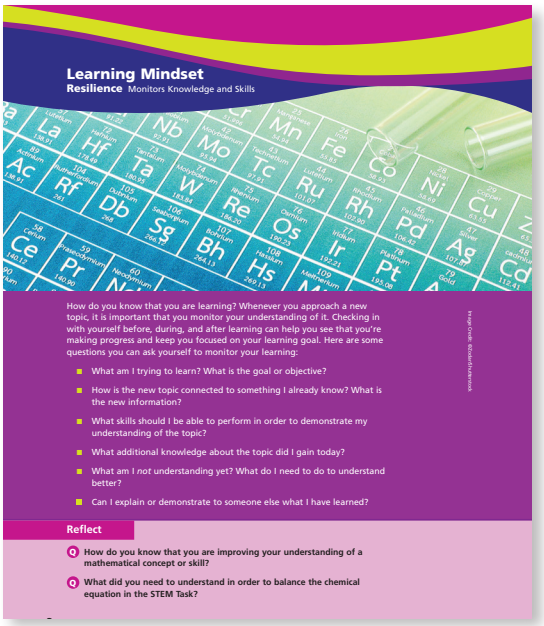
Transform Mathematics Fear

How is a child's first attempt at riding a bicycle similar to a student's first experience with higher-level mathematics? Fear. Your students are natural problem solvers. What they often lack is a set of strategies for overcoming fear and tapping into their innate perseverance.

Into AGA emphasizes effort in learning to reignite your students' beliefs that they're unstoppable. From embedded growth mindset tasks and explicit **social-emotional** instruction that support students in unlocking higher-level mathematical concepts, to independent learning activities that encourage productive perseverance, *Into AGA* transforms mathematics fear into mathematics enthusiasm.

Harness the Power of Mindset with HMH's Exclusive Partnership

Embedded mindset tasks that emphasize effort in learning and reignite a sense of curiosity combine with independent learning tasks that encourage students to collaborate with their peers to solve complex problems. **The result? Mathematics fear transforms into mathematics enthusiasm.**



Learning Mindset

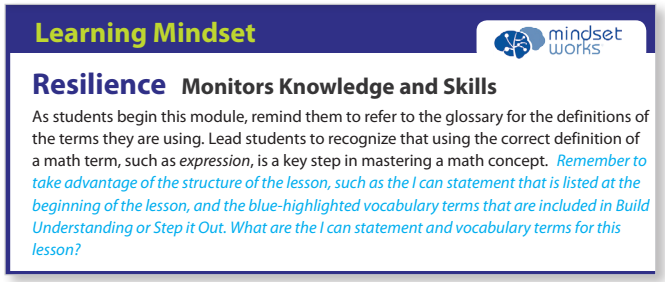
Resilience Monitors Knowledge and Skills

How do you know that you are learning? Whenever you approach a new topic, it is important that you monitor your understanding of it. Checking in with yourself before, during, and after learning can help you see that you're making progress and keep you focused on your learning goal. Here are some questions you can ask yourself to monitor your learning:

- What am I trying to learn? What is the goal or objective?
- How is the new topic connected to something I already know? What is the new information?
- What skills should I be able to perform in order to demonstrate my understanding of the topic?
- What additional knowledge about the topic did I gain today?
- What am I *not* understanding yet? What do I need to do to understand better?
- Can I explain or demonstrate to someone else what I have learned?

Reflect

- **How do you know that you are improving your understanding of a mathematical concept or skill?**
- **What did you need to understand in order to balance the chemical equation in the STEM Task?**



Learning Mindset

Resilience **Monitors Knowledge and Skills**

As students begin this module, remind them to refer to the glossary for the definitions of the terms they are using. Lead students to recognize that using the correct definition of a math term, such as *expression*, is a key step in mastering a math concept. *Remember to take advantage of the structure of the lesson, such as the I can statement that is listed at the beginning of the lesson, and the blue-highlighted vocabulary terms that are included in Build Understanding or Step it Out. What are the I can statement and vocabulary terms for this lesson?*

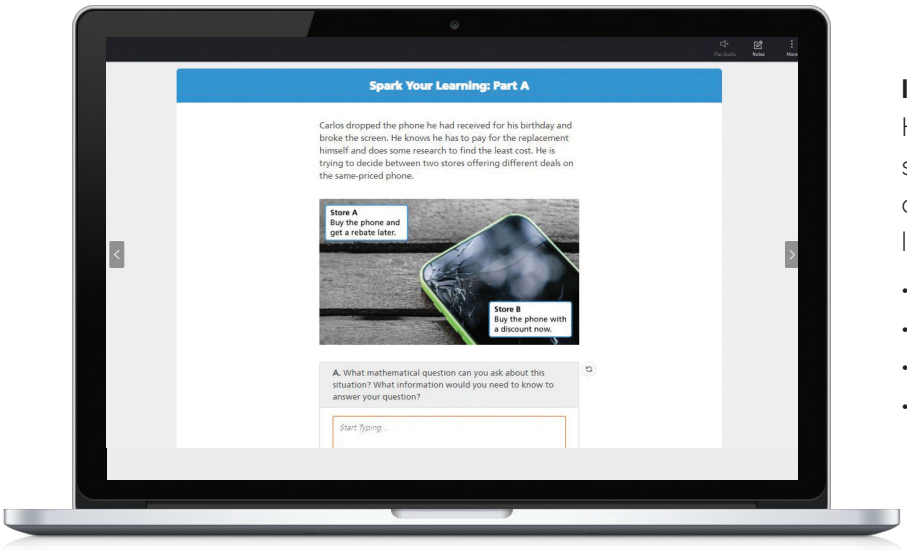
The research-based tasks and strategies from Mindset Works within each lesson allow students to see firsthand what they've learned and reflect on their progress.

Inspire Students to Understand **Their Effort Matters**

What dictates motivation? Why are some students persistent at problem solving while others are quick to give up? The answer lies in mindset and each student's belief in the power of effort.

A growth mindset guides students to understand that with perseverance they can be successful. As students put forth effort and witness their own success, they'll **WANT** to continue to challenge themselves as learners. Through our exclusive partnership with Mindset Works, *Into AGA* helps teachers put strategies for developing a growth mindset into action.

How do we help students monitor their own learning with the appropriate supports?



Interactive lessons on *Ed*, the HMH learning platform provide students with meaningful feedback and promote perseverance, using learning aids such as

- Helpful hints
- Multiple attempts
- Corrective feedback
- Correct answers

I Can

The scale below can help you and your students understand their progress on a learning goal.

4	I can explain how to write an algebraic expression, interpret its parts, and simplify it using the Distributive Property.
3	I can write an algebraic expression, interpret the parts of the expression, and use the Distributive Property to simplify the expression.
2	I can write an algebraic expression and interpret its parts.
1	I can interpret the parts of an algebraic expression.

Exit Ticket

Carlo's family picks 50 oranges and grapefruits. 20 are oranges. How many grapefruits does his family pick? Show how to solve this problem using any method you know.

Exit Tickets and **"I Can" scales** provide your students with tangible ways to monitor and celebrate their growth.

Put It in Writing

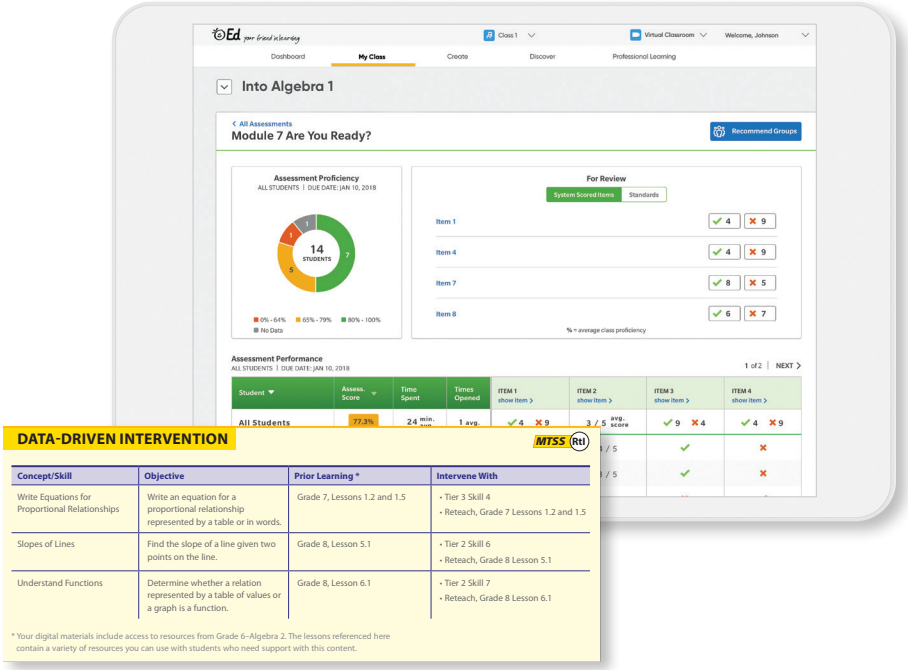
Describe some strategies you can use to evaluate $a^{\frac{m}{2}}$ for different values of a.

Put It in Writing provides opportunities for self-reflection and critical analysis.

Into AGA is . . . a solution designed **TO HELP STUDENTS PERSEVERE AND KNOW THEY CAN DO MATHEMATICS** in your classroom and beyond.

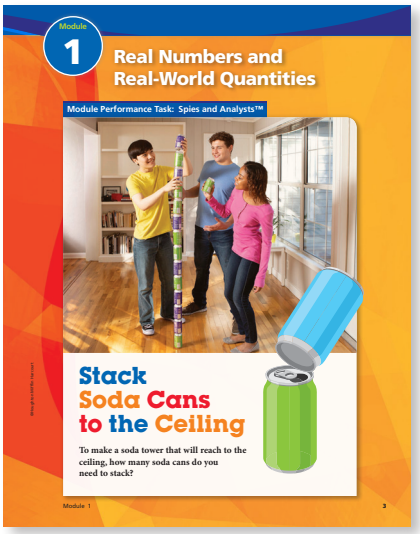
Keep Your Finger on the Pulse of **Student Progress**

In order to help students grow, you need to be able to understand where they are academically and what they need. Assessment tools, embedded throughout, monitor individual student progress and provide you with valuable insights every step of the way. Monitoring student progress and providing the appropriate student supports is streamlined for your preferred instructional delivery method: face-to-face, blended, or virtual instructional delivery.

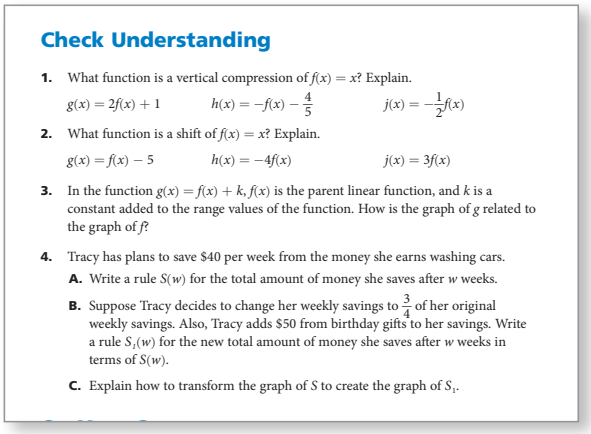


Are You Ready? diagnostic assessments help you pinpoint students' gaps in skills needed for success in the upcoming module. They are available in the Student Edition or as an interactive online assessment.

Spies and Analysts™ tasks from Into AGA author Robert Kaplinsky provide mathematical modeling opportunities for students and promote productive perseverance using practical applications to the mathematics.



Diagnostic, Summative, and Formative Assessments are easily accessible for teachers and students



Check Understanding

1. What function is a vertical compression of $f(x) = x$? Explain.

   $g(x) = 2f(x) + 1$ $\quad h(x) = -f(x) - \frac{4}{5}$ $\quad j(x) = -\frac{1}{2}f(x)$

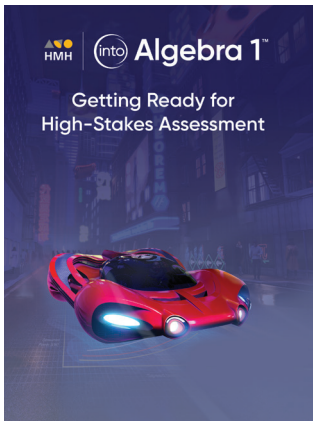
2. What function is a shift of $f(x) = x$? Explain.

   $g(x) = f(x) - 5$ $\quad h(x) = -4f(x)$ $\quad j(x) = 3f(x)$

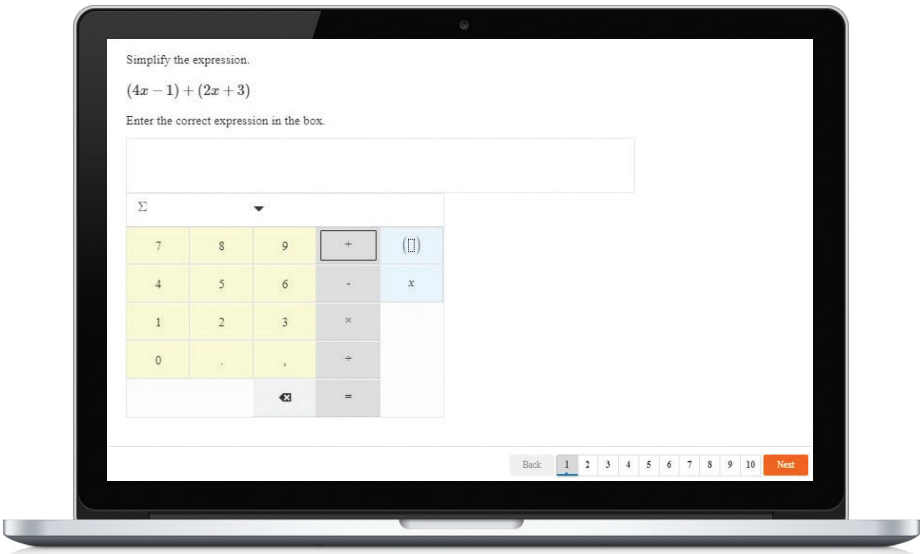
3. In the function $g(x) = f(x) + k$, $f(x)$ is the parent linear function, and k is a constant added to the range values of the function. How is the graph of g related to the graph of f?

4. Tracy has plans to save $40 per week from the money she earns washing cars.
   - **A.** Write a rule $S(w)$ for the total amount of money she saves after w weeks.
   - **B.** Suppose Tracy decides to change her weekly savings to $\frac{3}{4}$ of her original weekly savings. Also, Tracy adds $50 from birthday gifts to her savings. Write a rule $S_1(w)$ for the new total amount of money she saves after w weeks in terms of $S(w)$.
   - **C.** Explain how to transform the graph of S to create the graph of S_1.

Check Understanding formative assessments are just one way teachers and students can monitor progress within the lesson.



Module and Unit Assessments have multiple forms that can be edited. The **High-Stakes Assessment** workbook provides sample tests, standards-based lessons, and more.

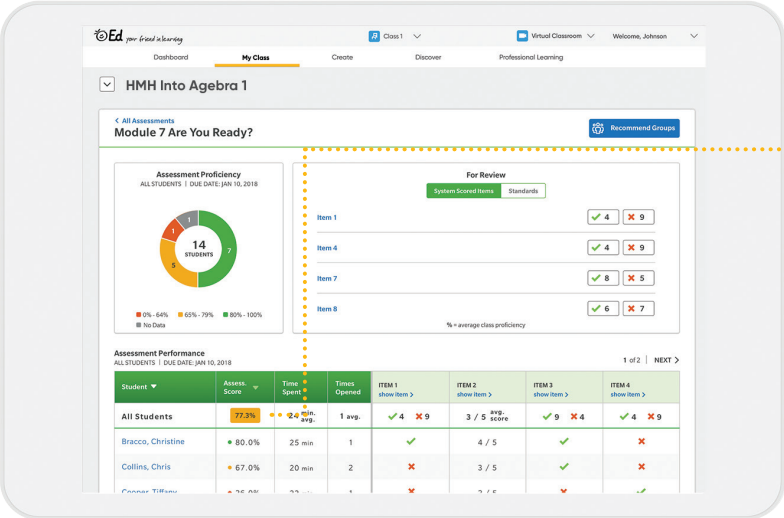


All assessments, including Benchmark Assessments, are assignable and autoscored online with multiple item-types, mirroring what students will encounter on high-stakes assessments.

Differentiate Learning and Assemble **Flexible Groups**

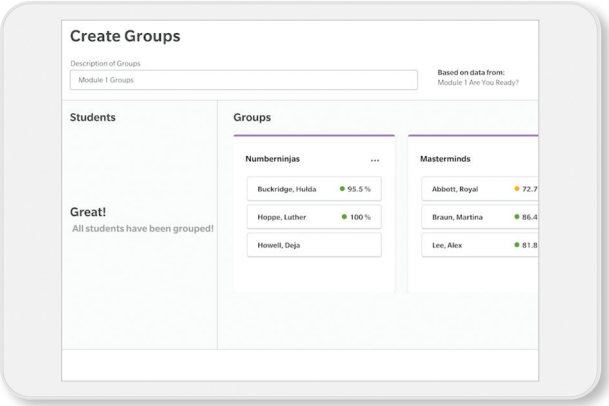
The data provided by our assessment tools help teachers identify the resources they can use to differentiate instruction in order to support student learning. Depending on their individual needs, students can move flexibly in and out of groups all year long. This equitable approach can be used when and where it is needed to ensure students thrive.

Mr. Baxter receives class and student scores for the Module 7 Are You Ready? Diagnostic Assessment.

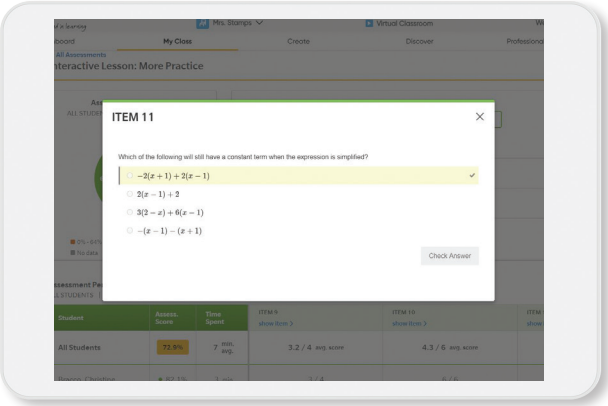


The average test score for the class is 77.3%. Mr. Baxter wants to see which students are ready to be challenged more, which students have mastered the concepts and skills, and which students need more targeted support.

After administering any assessment, Mr. Baxter can immediately review the class performance on *Ed*. He can quickly see a class-level breakdown of performance, as well as which items he should review with his students. From here, he can select the **Grouping Report** to have *Ed* sort the students into performance groups automatically. **Item Analysis, Assessment Reports, Standards Reports, and Suggested Resources** are just a click away for Mr. Baxter.



Groups are suggested based on student performance on assessments. Teachers can then modify these to form mixed-ability and other groupings.

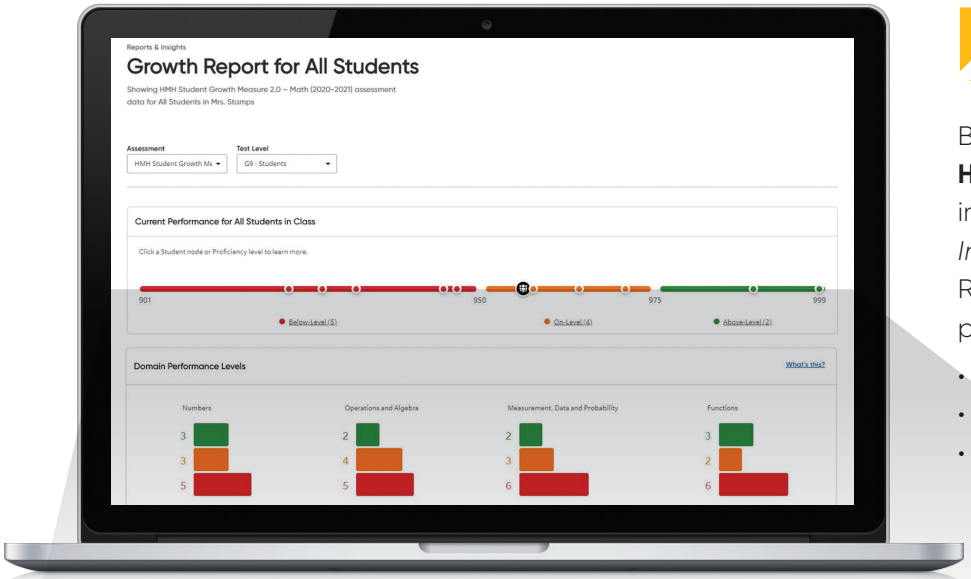


Drilling down into the data, teachers can analyze which items students have answered incorrectly or correctly. The items can be reviewed as a class, in groups, or one-on-one.

Track Yearly Progress with HMH **Growth Measure**

Meeting students' varied needs begins with a reliable benchmark assessment. HMH Growth Measure is the adaptive assessment that provides timely insights into student proficiency and connects these insights with *Into AGA* program data. Make the most of your assessment data with Growth Measure on *Ed*—one test, one place, meaningful connections.

Christine Bracco is a ninth-grade student who has gained 100 Quantile® measures from the beginning to the middle of the year. Her teacher can see her Math Growth Measure data from previous years to track her progress year over year.



Growth Measure

Benchmark assessment data from **HMH Growth Measure** combine with in-program assessment data from *Into AGA* in the Standards and Growth Reports to form a more complete picture of a student's knowledge.

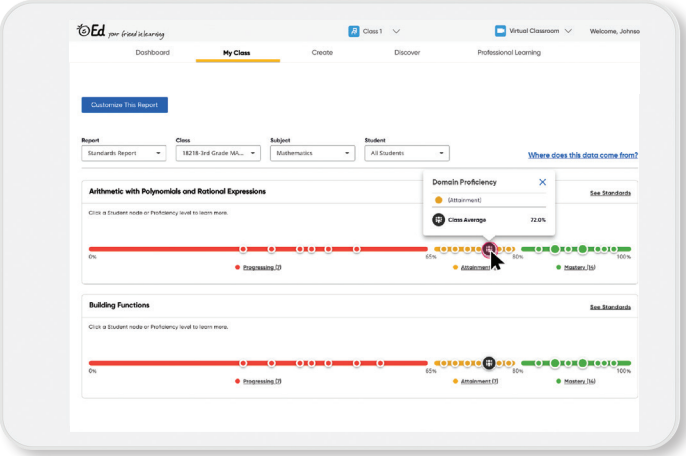
- Administer with Ease
- Assess in a Meaningful Way
- Connect Assessment with Relevant Practice in *Waggle*®

All Growth Measure Assessment Data

3 of 3 | End of Year Test Event

STUDENT	TEST DATE	TIME SPENT	HMH SCALED SCORE	PERFORMANCE LEVEL What's this?	CHANGE FROM PREVIOUS TEST	GRADE LEVEL EQUIVALENCY What's this?	STUDENT GROWTH INDEX What's this?	CURRENT LEXILE INTERVAL
CB Christine Bracco	Jan 25, 2020	35 min	971	On Level	↗ 7	Above Grade (1.32)	Met (0.96)	875 - 1025
AF Avary Fielding	Jan 25, 2020	27 min	922	Below Level	↘ 2	>2 Grades Below (0.24)	Did Not Meet (0.84)	595 - 745
XG Xavier Gaines	Jan 25, 2020	41 min	964	On Level	↗ 7	At Grade (1.17)	Met (0.99)	1110 - 1260
BH Brayton Hyde	Jan 25, 2020	36 min	989	Above Level	↗ 9	Above Grade (1.58)	Exceeded (1.14)	1415 - 1565

Intuitive Reports highlight Student Growth, Standards Mastery, Assessment Performance, Item Analysis, and more.



Success You Can Measure **and Celebrate**

Into AGA's unique lesson design provides a purposeful path to conceptual understanding and procedural fluency. This is achieved because *Into AGA*

- Emphasizes the importance of the "why" behind the "how"
- Allows students to build a deep understanding of mathematical concepts
- Connects conceptual to procedural lessons in a purposeful way
- Ensures students develop the ability to effectively apply understanding to higher level mathematical thinking
- Provides actionable data to identify gaps in knowledge with resources for teachers to target and repair these gaps

A New Approach to Building Conceptual Understanding and Procedural Fluency
Into AGA's unique learning progression intentionally links the conceptual with the procedural to boost students' mathematical thinking skills.

Let t = time after 4:00 p.m. in hours.

t	Lynn's Distance (mi)	Anna's Distance (mi)
0	0	0
0.1	5.4(0.1) = 0.54	0
0.2	5.4(0.2) = 1.08	6(0.2 − 0.1) = 0.6
0.5	5.4(0.5) = 2.7	6(0.5 − 0.1) = 2.4
0.8	5.4(0.8) = 4.32	6(0.8 − 0.1) = 4.2
0.9	5.4(0.9) = 4.86	6(0.9 − 0.1) = 4.8
1	5.4(1) = 5.4	6(1 − 0.1) = 5.4

Anna catches up with Lynn 1 hour after 4:00 p.m., or at 5:00 p.m.

Conceptual

Connecting Concepts to Procedural Tasks

Let t = Lynn's jogging time in hours.
Let $t - 0.1$ = Anna's jogging time in hours.

$$5.4t = 6(t - 0.1)$$
$$5.4t = 6t - 0.6$$
$$-0.6t = -0.6$$
$$t = 1$$

Anna catches up with Lynn 1 hour after Lynn starts jogging, or at 5:00 p.m.

Procedural

Lessons Build Off One Another to Make Learning Second Nature

Students are guided through lessons that build off one another to support students in developing the ability to apply what they're learning in your mathematics classroom to new situations.

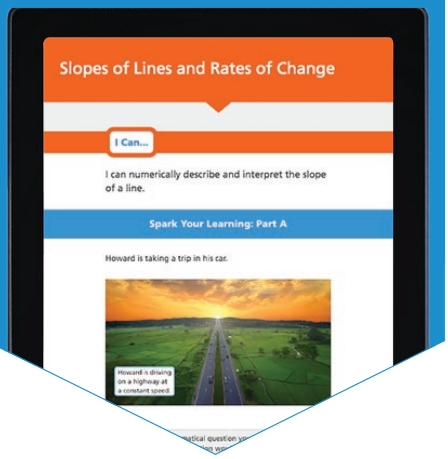
During lessons, students are doing more than using manipulatives, drawings, or algorithms to solve a problem. Students are

- Analyzing how and why they're using a model or strategy
- Explaining their thinking to their peers
- Making sense of problems in ways that allow easier application to new situations
- Critiquing the thinking of others, constructing viable arguments, and persevering

Unique Lessons Designed for Rigor **Right from the Start**

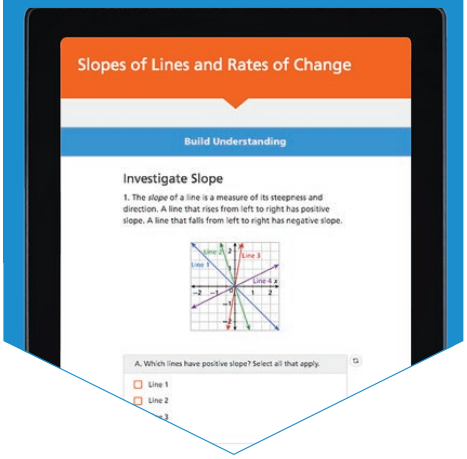
SPARK YOUR LEARNING

Teachers guide a whole-class discussion of a problem, help students persevere as they work in small groups to solve the problem, and build shared understanding by selecting groups to explain their solution method and reasoning.



LEARN TOGETHER

Teachers facilitate learning during *Build Understanding* tasks to ensure that students continue to play an active role in sharing their reasoning and understanding. In *Step It Out* tasks, students connect important processes and procedures to mathematical concepts.



CHECK UNDERSTANDING

Teachers utilize this quick formative assessment to determine whether students have mastered lesson content and to identify which differentiation resources will be most useful for each student.

DIFFERENTIATION OPTIONS

A variety of leveled resources are available to help teachers differentiate early and effectively.

WRAP-UP AND HOMEWORK

Teachers bring the class together to summarize the lesson using Exit Tickets, journal writing, or "I Can" self-assessment.

Small Groups	Teachers use the Small-Group activities to guide small groups of students towards understanding.
Independent Practice	Students can continue to the *On Your Own* portion of the lesson.
Collaborative Work	Teachers use Reteach, Challenge, and, when appropriate, Illustrative Mathematics and Desmos activities to foster classroom collaboration and reinforce learning.

Every *Into AGA* lesson provides ample opportunities for teachers to

- Engage students
- Check students' understanding as it develops

And for students to

- Practice what they are learning
- Refine their problem-solving skills
- Showcase their growing positive mathematical mindset

Give Students an Empowering Solution **That Motivates**

As your students embark on their mathematics journey, they need the right supports at the right time. With *Into AGA*, high-quality mathematical tasks, opportunities for collaboration and mathematical discourse, digital tools, and games work together to deliver an equitable learning experience that keeps students engaged from beginning to end.

Spark Your Learning

Students choose strategies and develop reasoning to make sense of problems.

Write, Interpret, and Simplify Expressions

I Can **write an algebraic expression, interpret the parts of the expression, and use the Distributive Property to simplify the expression.**

Spark Your Learning

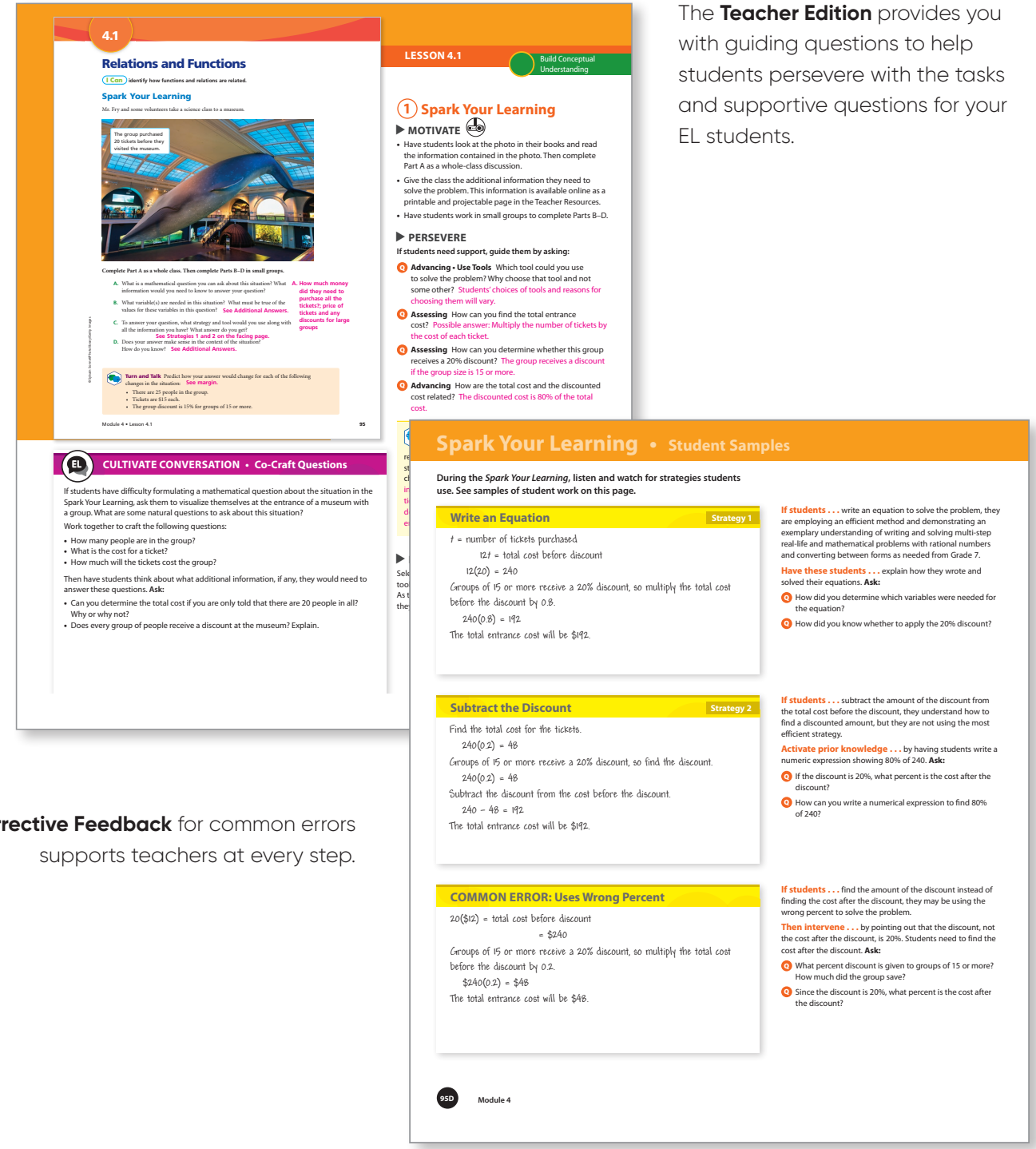
Carlos dropped the phone he had received for his birthday and broke the screen. He knows he has to pay for the replacement himself and does some research to find the least cost. He is trying to decide between two stores offering different deals on the same-priced phone.

Turn and Talk Suppose your teacher gave you the original full price of the phone. How could you use that information to verify your answer about where Carlos should buy the phone?

Spark Your Learning tasks build a shared understanding and allow learners to engage in the task at their own level. These tasks develop students' productive problem-solving habits and critical mathematical language.

For English learners, embedded **Turn and Talk** activities, designed by our experts at Math Solutions®, build proficiency and confidence while promoting mathematical discourse opportunities.

The **Teacher Edition** provides you with guiding questions to help students persevere with the tasks and supportive questions for your EL students.



4.1

Relations and Functions

I Can identify how functions and relations are related.

Spark Your Learning

Mr. Fry and some volunteers take a science class to a museum.

The group purchased 20 tickets before they visited the museum.

Complete Part A as a whole class. Then complete Parts B–D in small groups.

A. What is a mathematical question you can ask about this situation? What information would you need to know to answer your question?

B. What variable(s) are needed in this situation? What must be true of the values for these variables in this situation? See Additional Answers.

C. To answer your question, what strategy and tool would you use along with all the information you have? What answer do you get? See Strategies 1 and 2 on the facing page.

D. Does your answer make sense in the context of the situation? How do you know? See Additional Answers.

A. How much money did they need to purchase all the tickets?; price of tickets and any discounts for large groups

Turn and Talk Predict how your answer would change for each of the following changes in the situation: See margin.
- There are 25 people in the group.
- Tickets are $15 each.
- The group discount is 15% for groups of 15 or more.

Module 4 • Lesson 4.1 95

LESSON 4.1 Build Conceptual Understanding

1 Spark Your Learning

MOTIVATE
- Have students look at the photo in their books and read the information contained in the photo. Then complete Part A as a whole-class discussion.
- Give the class the additional information they need to solve the problem. This information is available online as a printable and projectable page in the Teacher Resources.
- Have students work in small groups to complete Parts B–D.

PERSEVERE

If students need support, guide them by asking:

Q **Advancing • Use Tools** Which tool could you use to solve the problem? Why choose that tool and not some other? Students' choices of tools and reasons for choosing them will vary.

Q **Assessing** How can you find the total entrance cost? Possible answer: Multiply the number of tickets by the cost of each ticket.

Q **Assessing** How can you determine whether this group receives a 20% discount? The group receives a discount if the group size is 15 or more.

Q **Advancing** How are the total cost and the discounted cost related? The discounted cost is 80% of the total cost.

EL **CULTIVATE CONVERSATION • Co-Craft Questions**

If students have difficulty formulating a mathematical question about the situation in the Spark Your Learning, ask them to visualize themselves at the entrance of a museum with a group. What are some natural questions to ask about this situation?

Work together to craft the following questions:
- How many people are in the group?
- What is the cost for a ticket?
- How much will the tickets cost the group?

Then have students think about what additional information, if any, they would need to answer these questions. **Ask:**
- Can you determine the total cost if you are only told that there are 20 people in all? Why or why not?
- Does every group of people receive a discount at the museum? Explain.

Spark Your Learning • Student Samples

During the *Spark Your Learning*, listen and watch for strategies students use. See samples of student work on this page.

Write an Equation — Strategy 1

t = number of tickets purchased

$12t$ = total cost before discount

$12(20) = 240$

Groups of 15 or more receive a 20% discount, so multiply the total cost before the discount by 0.8.

$240(0.8) = 192$

The total entrance cost will be $192.

If students . . . write an equation to solve the problem, they are employing an efficient method and demonstrating an exemplary understanding of writing and solving multi-step real-life and mathematical problems with rational numbers and converting between forms as needed from Grade 7.

Have these students . . . explain how they wrote and solved their equations. **Ask:**

Q How did you determine which variables were needed for the equation?

Q How did you know whether to apply the 20% discount?

Subtract the Discount — Strategy 2

Find the total cost for the tickets.

$240(0.2) = 48$

Groups of 15 or more receive a 20% discount, so find the discount.

$240(0.2) = 48$

Subtract the discount from the cost before the discount.

$240 - 48 = 192$

The total entrance cost will be $192.

If students . . . subtract the amount of the discount from the total cost before the discount, they understand how to find a discounted amount, but they are not using the most efficient strategy.

Activate prior knowledge . . . by having students write a numeric expression showing 80% of 240. **Ask:**

Q If the discount is 20%, what percent is the cost after the discount?

Q How can you write a numerical expression to find 80% of 240?

COMMON ERROR: Uses Wrong Percent

$20(\$12)$ = total cost before discount

$= \$240$

Groups of 15 or more receive a 20% discount, so multiply the total cost before the discount by 0.2.

$\$240(0.2) = \$48$

The total entrance cost will be $48.

If students . . . find the amount of the discount instead of finding the cost after the discount, they may be using the wrong percent to solve the problem.

Then intervene . . . by pointing out that the discount, not the cost after the discount, is 20%. Students need to find the cost after the discount. **Ask:**

Q What percent discount is given to groups of 15 or more? How much did the group save?

Q Since the discount is 20%, what percent is the cost after the discount?

95D Module 4

Corrective Feedback for common errors supports teachers at every step.

Ensure Growth with **Handy Resources**

Into AGA supports the potential growth within each and every student by providing

- English and mathematical language development embedded into every lesson
- Research-based routines that engage all students in listening, speaking, reading, and writing about mathematics
- English Proficiency Level supports that keep the rigor intact while students are mastering the language
- Ongoing assessments that enable teachers to offer targeted and specific instruction for every student's needs (also available in Spanish)

Co-Craft Questions and Problems Lesson 2.1, 2.2, 2.5

Students think of natural questions to ask about a given situation or problems similar to a given task and answer the questions they have developed or problems they have created.

Three Reads Lessons 2.2–2.5

Students read a problem three times with a specific focus each time.

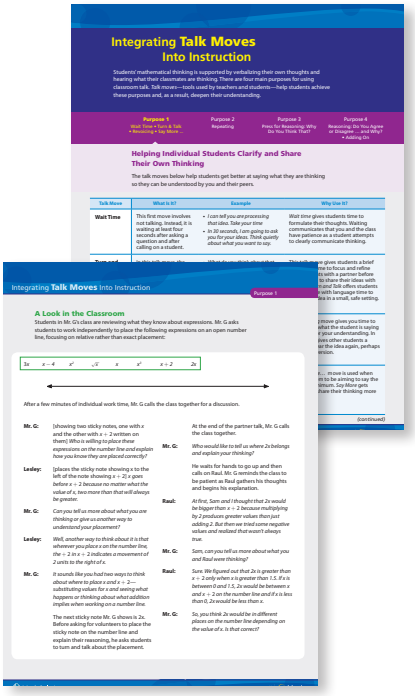
1st Read What is the situation about?
2nd Read What are the quantities in the situation?
3rd Read What are the possible mathematical questions that we could ask for the situation?

Information Gap Lessons 2.1, 2.4

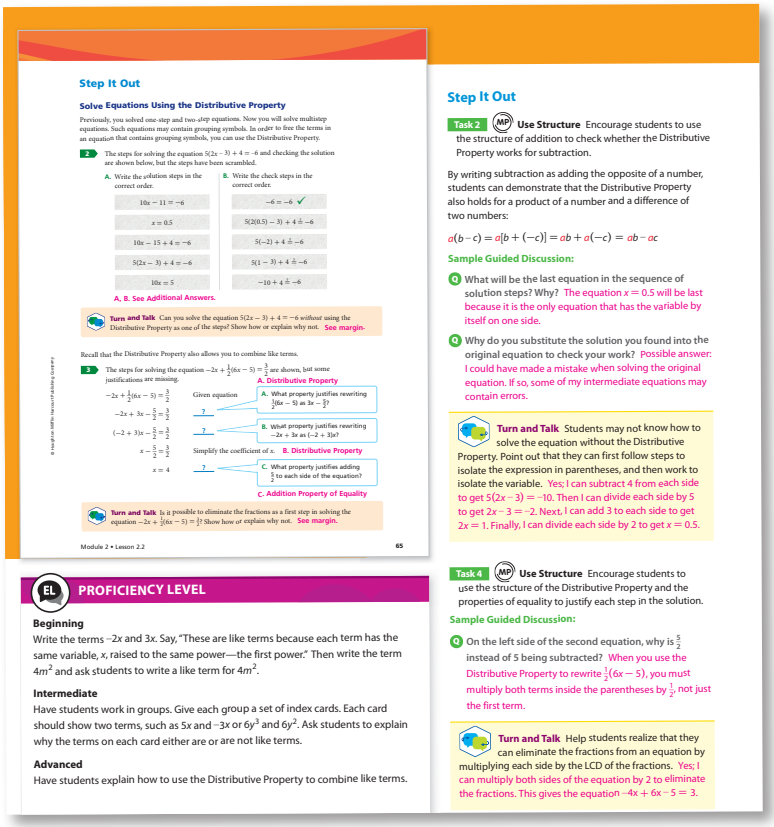
Students recognize when information given in a problem situation is incomplete and they pose questions and share knowledge with others to discover any missing facts or relationships and work together to solve the problem.

Critique, Correct, and Clarify Lessons 2.4, 2.5

Students correct the work in a flawed explanation, argument, or solution method and share with a partner and refine the sample work.



Embedded into every lesson, **Language Development Routines** guide you through the steps you need to take to ensure all learners succeed.



Step It Out

Solve Equations Using the Distributive Property

Previously, you solved one-step and two-step equations. Now you will solve multistep equations. Such equations may contain grouping symbols. In order to free the terms in an equation that contains grouping symbols, you can use the Distributive Property.

2 The steps for solving the equation $5(2x - 3) + 4 = -6$ and checking the solution are shown below, but the steps have been scrambled.

A. Write the solution steps in the correct order.

$10x - 11 = -6$

$x = 0.5$

$10x - 15 + 4 = -6$

$5(2x - 3) + 4 = -6$

$10x = 5$

B. Write the check steps in the correct order.

$-6 = -6$ ✓

$5(2(0.5) - 3) + 4 \stackrel{?}{=} -6$

$5(-2) + 4 \stackrel{?}{=} -6$

$5(1 - 3) + 4 \stackrel{?}{=} -6$

$-10 + 4 \stackrel{?}{=} -6$

A, B. See Additional Answers.

Turn and Talk Can you solve the equation $5(2x - 3) + 4 = -6$ *without* using the Distributive Property as one of the steps? Show how or explain why not. See margin.

Recall that the Distributive Property also allows you to combine like terms.

3 The steps for solving the equation $-2x + \frac{1}{2}(6x - 5) = \frac{3}{2}$ are shown, but some justifications are missing.

A. Distributive Property

$-2x + \frac{1}{2}(6x - 5) = \frac{3}{2}$ Given equation

$-2x + 3x - \frac{5}{2} = \frac{3}{2}$?

$(-2 + 3)x - \frac{5}{2} = \frac{3}{2}$?

$x - \frac{5}{2} = \frac{3}{2}$ Simplify the coefficient of x. B. Distributive Property

$x = 4$?

A. What property justifies rewriting $\frac{1}{2}(6x - 5)$ as $3x - \frac{5}{2}$?

B. What property justifies rewriting $-2x + 3x$ as $(-2 + 3)x$?

C. What property justifies adding $\frac{5}{2}$ to each side of the equation?

C. Addition Property of Equality

Turn and Talk Is it possible to eliminate the fractions as a first step in solving the equation $-2x + \frac{1}{2}(6x - 5) = \frac{3}{2}$? Show how or explain why not. See margin.

Module 2 • Lesson 2.2 65

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Step It Out

Task 2 MP Use Structure Encourage students to use the structure of addition to check whether the Distributive Property works for subtraction.

By writing subtraction as adding the opposite of a number, students can demonstrate that the Distributive Property also holds for a product of a number and a difference of two numbers:

$a(b - c) = a[b + (-c)] = ab + a(-c) = ab - ac$

Sample Guided Discussion:

Q What will be the last equation in the sequence of solution steps? Why? The equation $x = 0.5$ will be last because it is the only equation that has the variable by itself on one side.

Q Why do you substitute the solution you found into the original equation to check your work? Possible answer: I could have made a mistake when solving the original equation. If so, some of my intermediate equations may contain errors.

Turn and Talk Students may not know how to solve the equation without the Distributive Property. Point out that they can first follow steps to isolate the expression in parentheses, and then work to isolate the variable. Yes; I can subtract 4 from each side to get $5(2x - 3) = -10$. Then I can divide each side by 5 to get $2x - 3 = -2$. Next, I can add 3 to each side to get $2x = 1$. Finally, I can divide each side by 2 to get $x = 0.5$.

Task 4 MP Use Structure Encourage students to use the structure of the Distributive Property and the properties of equality to justify each step in the solution.

Sample Guided Discussion:

Q On the left side of the second equation, why is $\frac{5}{2}$ instead of 5 being subtracted? When you use the Distributive Property to rewrite $\frac{1}{2}(6x - 5)$, you must multiply both terms inside the parentheses by $\frac{1}{2}$, not just the first term.

Turn and Talk Help students realize that they can eliminate the fractions from an equation by multiplying each side by the LCD of the fractions. Yes; I can multiply both sides of the equation by 2 to eliminate the fractions. This gives the equation $-4x + 6x - 5 = 3$.

EL PROFICIENCY LEVEL

Beginning

Write the terms $-2x$ and $3x$. Say, "These are like terms because each term has the same variable, x, raised to the same power—the first power." Then write the term $4m^2$ and ask students to write a like term for $4m^2$.

Intermediate

Have students work in groups. Give each group a set of index cards. Each card should show two terms, such as $5x$ and $-3x$ or $6y^3$ and $6y^2$. Ask students to explain why the terms on each card either are or are not like terms.

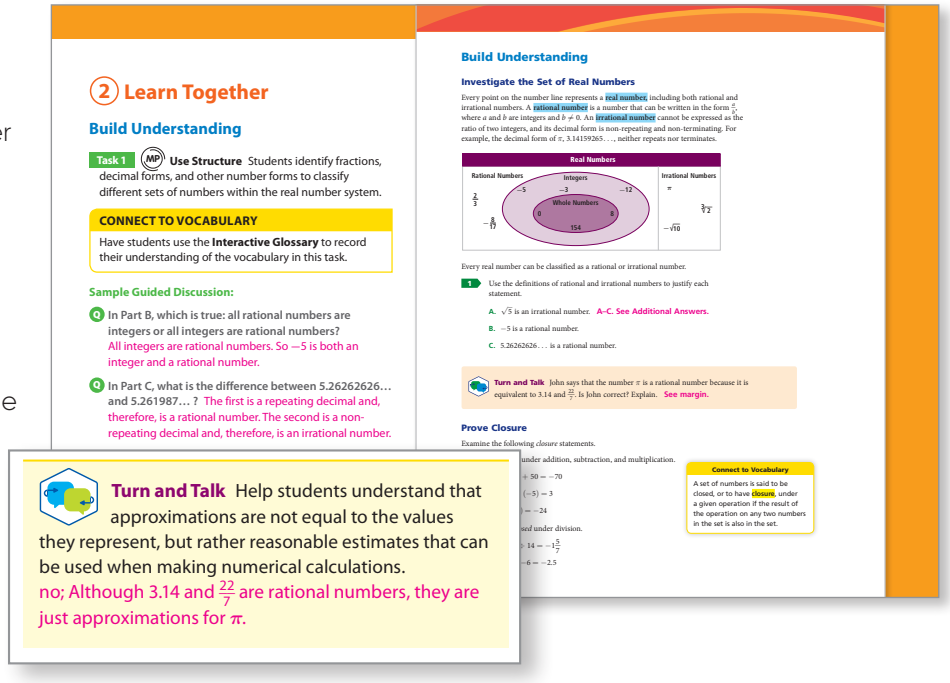
Advanced

Have students explain how to use the Distributive Property to combine like terms.

English Language Proficiency Level supports keep the rigor intact for all of your learners of the language of mathematics.

Just-Right Questions stretch student thinking and help them work through challenges. Guided discussion questions offer opportunities for teachers to prompt conversations that build understanding.

Leveled question suggestions with associated Depth of Knowledge (DOK) levels within the Teacher Edition further support the strengthening of student understanding.



2 Learn Together

Build Understanding

Task 1 MP Use Structure Students identify fractions, decimal forms, and other number forms to classify different sets of numbers within the real number system.

CONNECT TO VOCABULARY

Have students use the **Interactive Glossary** to record their understanding of the vocabulary in this task.

Sample Guided Discussion:

Q In Part B, which is true: all rational numbers are integers or all integers are rational numbers? All integers are rational numbers. So -5 is both an integer and a rational number.

Q In Part C, what is the difference between 5.26262626… and 5.261987…? The first is a repeating decimal and, therefore, is a rational number. The second is a non-repeating decimal and, therefore, is an irrational number.

Turn and Talk Help students understand that approximations are not equal to the values they represent, but rather reasonable estimates that can be used when making numerical calculations. no; Although 3.14 and $\frac{22}{7}$ are rational numbers, they are just approximations for π.

Build Understanding

Investigate the Set of Real Numbers

Every point on the number line represents a real number, including both rational and irrational numbers. A rational number is a number that can be written in the form $\frac{a}{b}$, where a and b are integers and $b \neq 0$. An irrational number cannot be expressed as the ratio of two integers, and its decimal form is non-repeating and non-terminating. For example, the decimal form of π, 3.14159265…, neither repeats nor terminates.

Real Numbers

Rational Numbers: $\frac{2}{3}$, $-\frac{8}{17}$

Integers: -5, -3, -12

Whole Numbers: 0, 8, 154

Irrational Numbers: π, $\frac{3}{2}\sqrt{2}$, $-\sqrt{10}$

Every real number can be classified as a rational or irrational number.

1 Use the definitions of rational and irrational numbers to justify each statement.

A. $\sqrt{5}$ is an irrational number. A–C. See Additional Answers.

B. -5 is a rational number.

C. 5.26262626… is a rational number.

Turn and Talk John says that the number π is a rational number because it is equivalent to 3.14 and $\frac{22}{7}$. Is John correct? Explain. See margin.

Prove Closure

Examine the following *closure* statements.

under addition, subtraction, and multiplication.

$+ 50 = -70$

$(-5) = 3$

$= -24$

set under division.

$\div 14 = -1\frac{5}{7}$

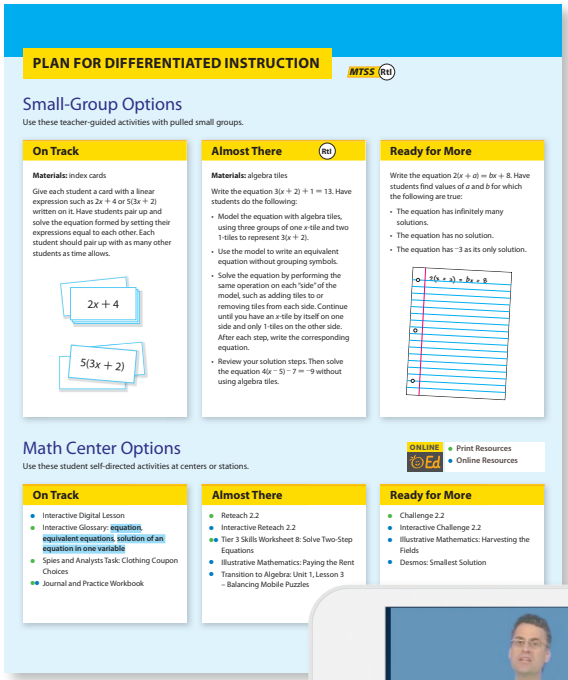
$\div -6 = -2.5$

Connect to Vocabulary

A set of numbers is said to be closed, or to have closure, under a given operation if the result of the operation on any two numbers in the set is also in the set.

EL Support at Point-of-Use

More Resources When You Need Them



PLAN FOR DIFFERENTIATED INSTRUCTION

MTSS RtI

Small-Group Options

Use these teacher-guided activities with pulled small groups.

On Track

Materials: index cards

Give each student a card with a linear expression such as $2x + 4$ or $5(3x + 2)$ written on it. Have students pair up and solve the equation formed by setting their expressions equal to each other. Each student should pair up with as many other students as time allows.

$2x + 4$

$5(3x + 2)$

Almost There RtI

Materials: algebra tiles

Write the equation $3(x + 2) + 1 = 13$. Have students do the following:

- Model the equation with algebra tiles, using three groups of one x-tile and two 1-tiles to represent $3(x + 2)$.
- Use the model to write an equivalent equation without grouping symbols.
- Solve the equation by performing the same operation on each "side" of the model, such as adding tiles to or removing tiles from each side. Continue until you have an x-tile by itself on one side and only 1-tiles on the other side. After each step, write the corresponding equation.
- Review your solution steps. Then solve the equation $4(x - 5) - 7 = -9$ without using algebra tiles.

Ready for More

Write the equation $2(x + a) = bx + 8$. Have students find values of a and b for which the following are true:

- The equation has infinitely many solutions.
- The equation has no solution.
- The equation has -3 as its only solution.

$2(x + a) = bx + 8$

Math Center Options

Use these student self-directed activities at centers or stations.

ONLINE Ed
- Print Resources
- Online Resources

On Track

- Interactive Digital Lesson
- Interactive Glossary: equation, equivalent equations, solution of an equation in one variable
- Spies and Analysts Task: Clothing Coupon Choices
- Journal and Practice Workbook

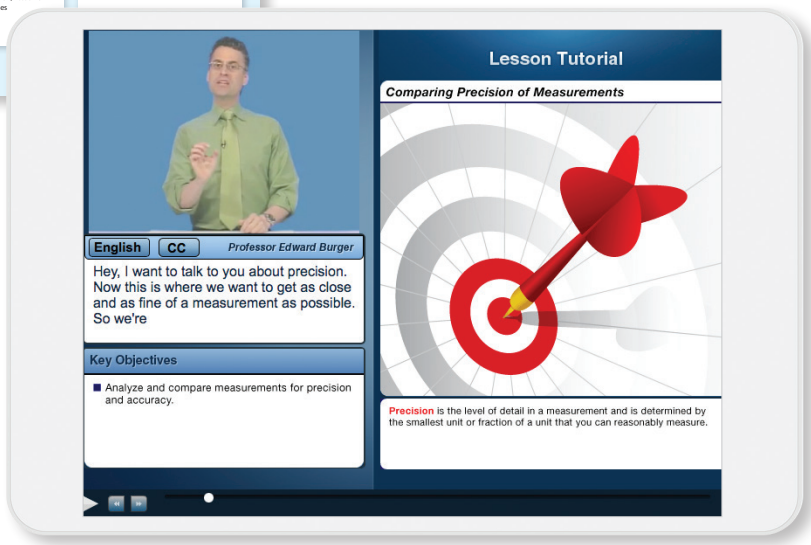
Almost There

- Reteach 2.2
- Interactive Reteach 2.2
- Tier 3 Skills Worksheet 8: Solve Two-Step Equations
- Illustrative Mathematics: Paying the Rent
- Transition to Algebra: Unit 1, Lesson 3 – Balancing Mobile Puzzles

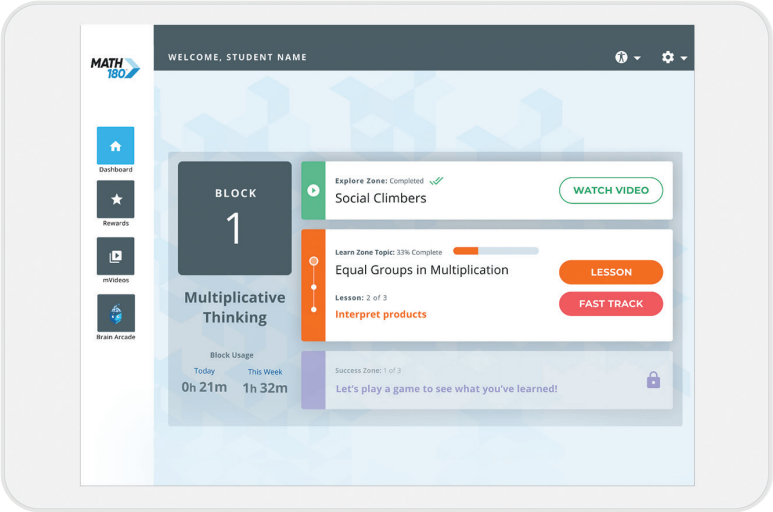
Ready for More

- Challenge 2.2
- Interactive Challenge 2.2
- Illustrative Mathematics: Harvesting the Fields
- Desmos: Smallest Solution

Differentiate for every student with embedded recommendations and resource suggestions.

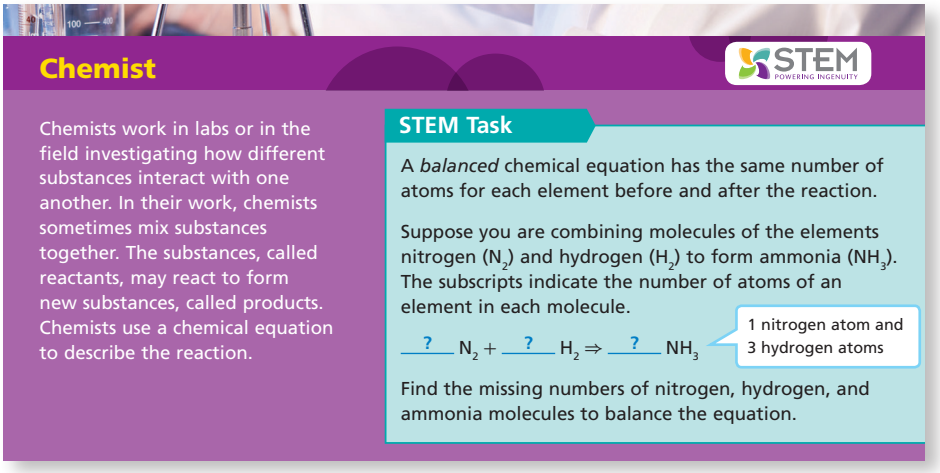


Math on the Spot, located in Family Resources, provides students and families with videos and interactive experiences that help with homework. Additionally, access the **Family Room** for tips and strategies to bolster at-home learning.



MATH 180® is a revolutionary math intervention program for students in Grades 5–12, that focuses on deep understanding and mastery of the essential skills and concepts necessary to unlock algebra and advanced mathematics. Districts can successfully

Contextualized Learning gives students the opportunity to see that mathematics has purpose. Each unit is tied to a career theme and offers related problems that link students' career aspirations to mathematics.



Chemist

STEM POWERING INGENUITY

Chemists work in labs or in the field investigating how different substances interact with one another. In their work, chemists sometimes mix substances together. The substances, called reactants, may react to form new substances, called products. Chemists use a chemical equation to describe the reaction.

STEM Task

A *balanced* chemical equation has the same number of atoms for each element before and after the reaction.

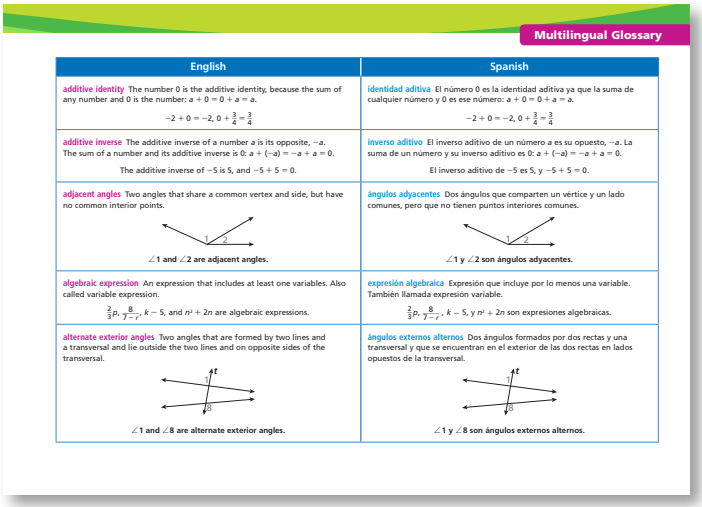
Suppose you are combining molecules of the elements nitrogen (N_2) and hydrogen (H_2) to form ammonia (NH_3). The subscripts indicate the number of atoms of an element in each molecule.

$\underline{\ ?\ }\ N_2 + \underline{\ ?\ }\ H_2 \Rightarrow \underline{\ ?\ }\ NH_3$

1 nitrogen atom and 3 hydrogen atoms

Find the missing numbers of nitrogen, hydrogen, and ammonia molecules to balance the equation.

A Multilingual eGlossary translates English vocabulary into additional languages



Multilingual Glossary

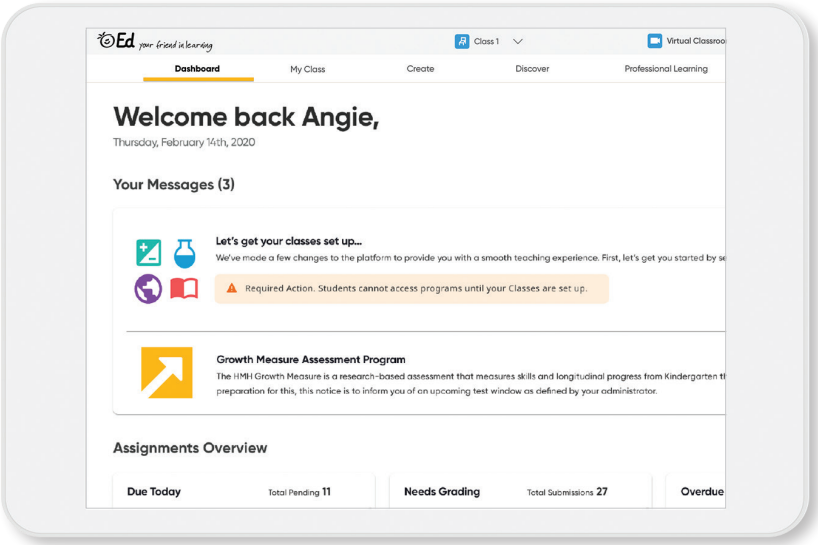
English	Spanish
additive identity The number 0 is the additive identity, because the sum of any number and 0 is the number: $a + 0 = 0 + a = a$. $-2 + 0 = -2$, $0 + \frac{3}{4} = \frac{3}{4}$	**identidad aditiva** El número 0 es la identidad aditiva ya que la suma de cualquier número y 0 es ese número: $a + 0 = 0 + a = a$. $-2 + 0 = -2$, $0 + \frac{3}{4} = \frac{3}{4}$
additive inverse The additive inverse of a number a is its opposite, $-a$. The sum of a number and its additive inverse is 0: $a + (-a) = -a + a = 0$. The additive inverse of -5 is 5, and $-5 + 5 = 0$.	**inverso aditivo** El inverso aditivo de un número a es su opuesto, $-a$. La suma de un número y su inverso aditivo es 0: $a + (-a) = -a + a = 0$. El inverso aditivo de -5 es 5, y $-5 + 5 = 0$.
adjacent angles Two angles that share a common vertex and side, but have no common interior points. $\angle 1$ and $\angle 2$ are adjacent angles.	**ángulos adyacentes** Dos ángulos que comparten un vértice y un lado comunes, pero que no tienen puntos interiores comunes. $\angle 1$ y $\angle 2$ son ángulos adyacentes.
algebraic expression An expression that includes at least one variables. Also called variable expression. $\frac{2}{3}p$, $\frac{8}{7-r}$, $k - 5$, and $n^2 + 2n$ are algebraic expressions.	**expresión algebraica** Expresión que incluye por lo menos una variable. También llamada expresión variable. $\frac{2}{3}p$, $\frac{8}{7-r}$, $k - 5$, y $n^2 + 2n$ son expresiones algebraicas.
alternate exterior angles Two angles that are formed by two lines and a transversal and lie outside the two lines and on opposite sides of the transversal. $\angle 1$ and $\angle 8$ are alternate exterior angles.	**ángulos externos alternos** Dos ángulos formados por dos rectas y una transversal y que se encuentran en el exterior de las dos rectas en lados opuestos de la transversal. $\angle 1$ y $\angle 8$ son ángulos externos alternos.

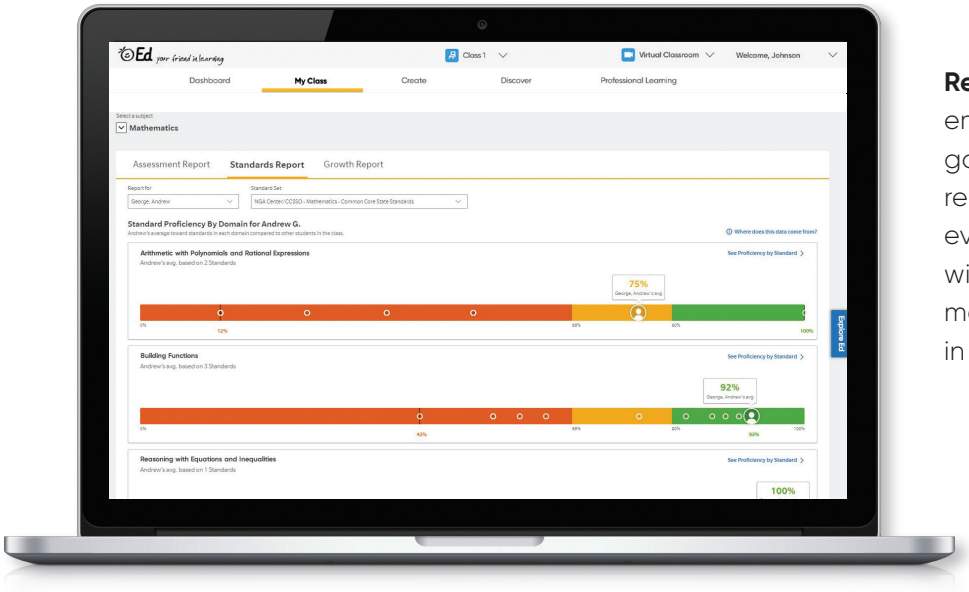
Make the Most of **Instructional Time**

What do you need to effectively support students as they grow into their potential? More than anything else, you need the ability to make the most of your instructional time.

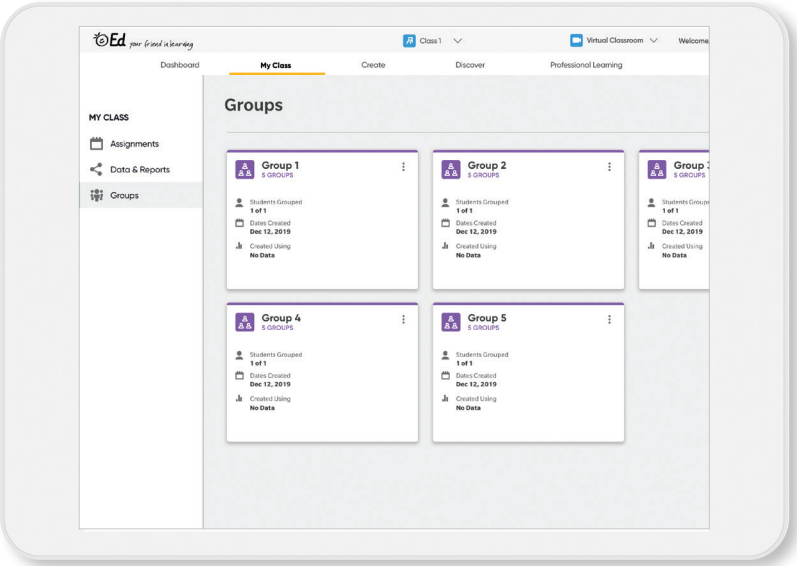
From the moment you sit down to plan instruction for the year ahead, to the day your students move from your classroom to the next, *Into AGA* was designed to support you.

- **Day-to-day planning** is streamlined, ready to use, and customizable.
- **Data collection** is automated and easy to access and interpret.
- **Differentiation strategies and resources** are targeted, clear, and easily implemented.
- **Professional learning** support is embedded throughout every lesson and available on demand for the life of your subscription through Teacher's Corner™, your digital hub for professional learning. This is your place to collaborate and dig into content from thought leaders, authors, HMH coaches, and other teachers, for the life of your subscription.



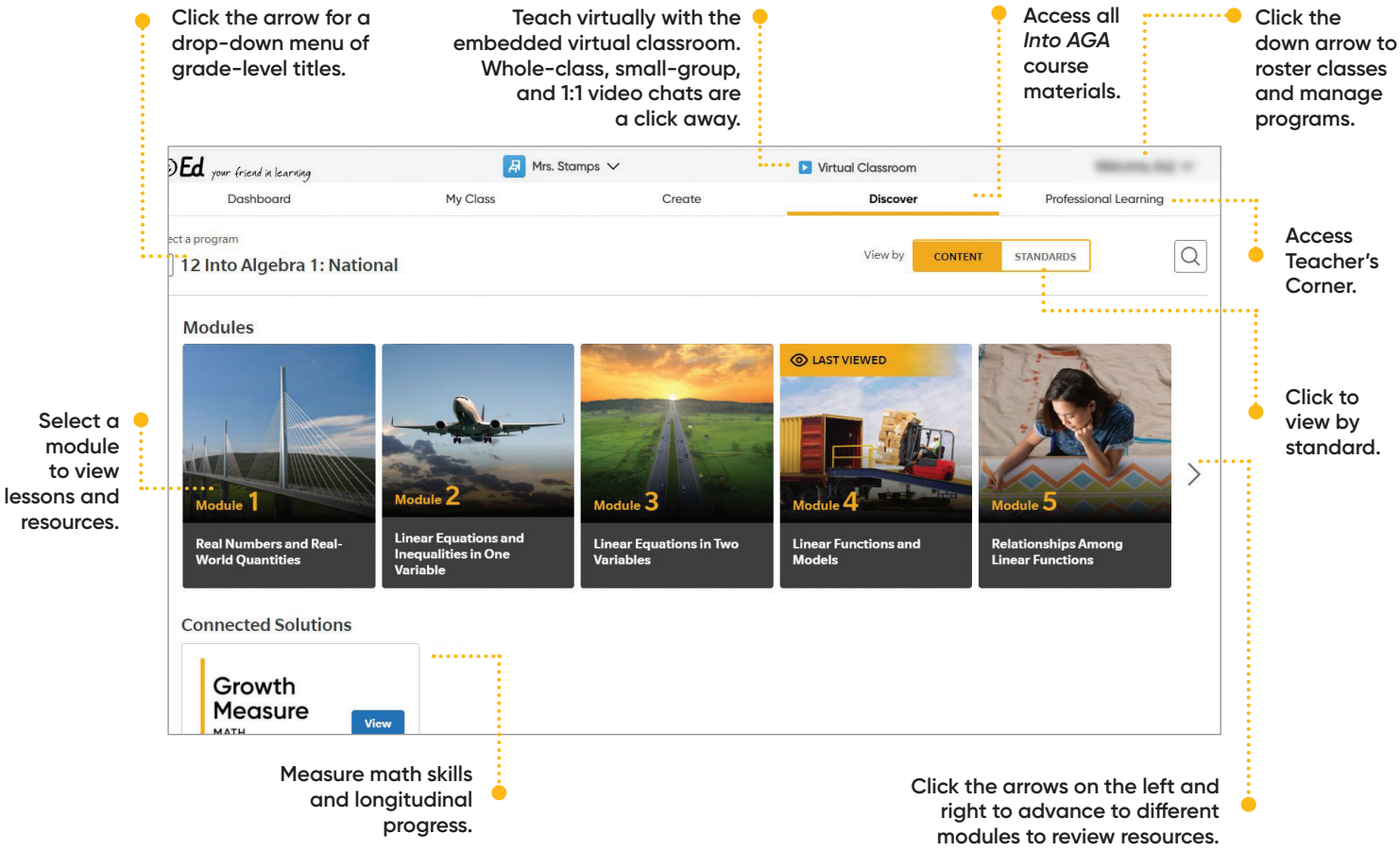


Real-time data insights empower you to spot proficiency gaps, identify students who are ready to stretch their thinking even further, and match students with targeted resources that meet them where they are in their journey.



Easy-to-use grouping and planning tools allow you efficient sharing of assessments and lesson plans, even in **Google® Classroom**.

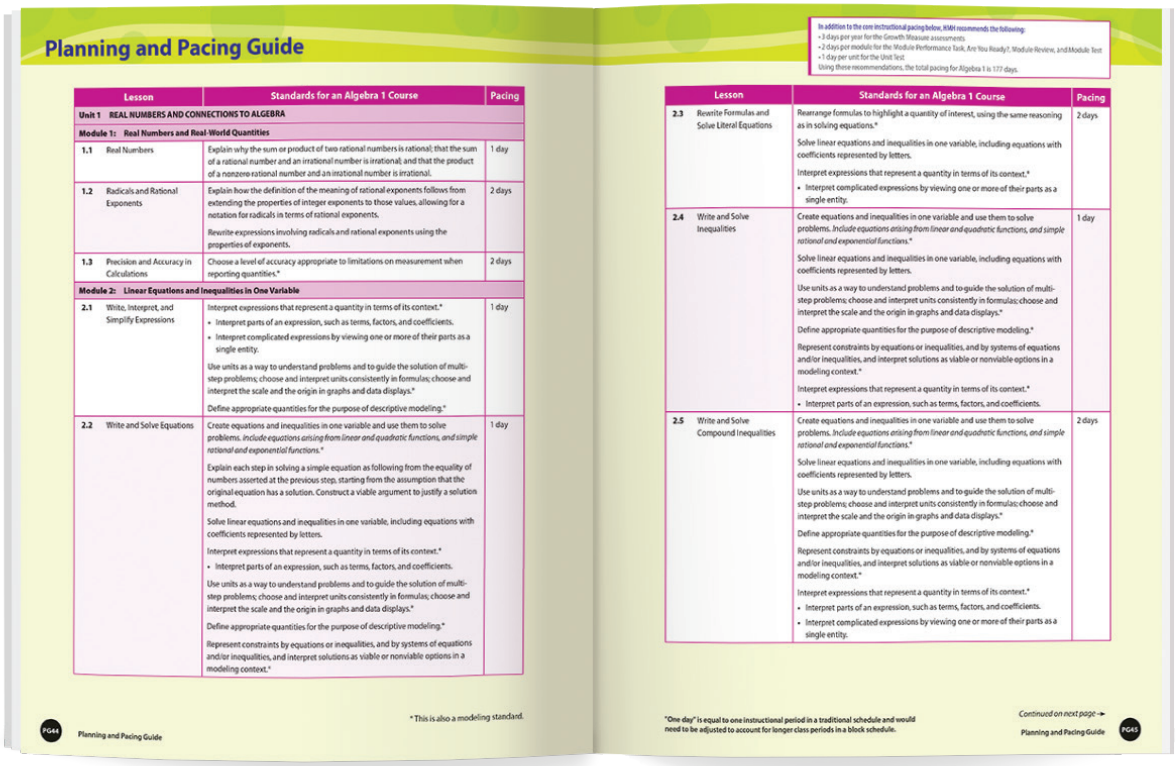
Streamline Planning with **All-in-One Resources**



Planning is easy with *Ed*. You can leverage data to create lesson plans as well as assign work to entire classes, multiple classes, or individual students.

Ed, the HMH learning platform, is an online learning system that combines the best of technology, content, and instruction to create a comprehensive teaching and learning experience for every teacher and student. With *Ed*, teachers can easily plan lessons and group students to provide targeted differentiation.

Print Resources for Planning and Differentiation



Planning and Pacing Guide

Lesson	Standards for an Algebra 1 Course	Pacing
Unit 1 REAL NUMBERS AND CONNECTIONS TO ALGEBRA		
Module 1: Real Numbers and Real-World Quantities		
1.1 Real Numbers	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.	1 day
1.2 Radicals and Rational Exponents	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. Rewrite expressions involving radicals and rational exponents using the properties of exponents.	2 days
1.3 Precision and Accuracy in Calculations	Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.*	2 days
Module 2: Linear Equations and Inequalities in One Variable		
2.1 Write, Interpret, and Simplify Expressions	Interpret expressions that represent a quantity in terms of its context.* • Interpret parts of an expression, such as terms, factors, and coefficients. • Interpret complicated expressions by viewing one or more of their parts as a single entity. 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.* Define appropriate quantities for the purpose of descriptive modeling.*	1 day
2.2 Write and Solve Equations	Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions.* 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. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. Interpret expressions that represent a quantity in terms of its context.* • Interpret parts of an expression, such as terms, factors, and coefficients. 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.* Define appropriate quantities for the purpose of descriptive modeling.* 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.*	1 day

* This is also a modeling standard.

PG44 Planning and Pacing Guide

In addition to the core instructional pacing below, HMH recommends the following:
• 3 days per year for the Growth Measure assessments
• 2 days per module for the Module Performance Task, Are You Ready?, Module Review, and Module Test
• 1 day per unit for the Unit Test
Using these recommendations, the total pacing for Algebra 1 is 177 days.

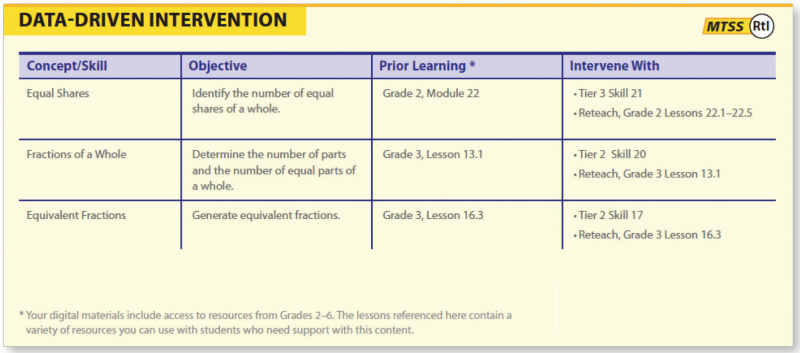
Lesson	Standards for an Algebra 1 Course	Pacing
2.3 Rewrite Formulas and Solve Literal Equations	Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.* Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. Interpret expressions that represent a quantity in terms of its context.* • Interpret complicated expressions by viewing one or more of their parts as a single entity.	2 days
2.4 Write and Solve Inequalities	Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions.* Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. 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.* Define appropriate quantities for the purpose of descriptive modeling.* 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.* Interpret expressions that represent a quantity in terms of its context.* • Interpret parts of an expression, such as terms, factors, and coefficients.	1 day
2.5 Write and Solve Compound Inequalities	Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions.* Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. 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.* Define appropriate quantities for the purpose of descriptive modeling.* 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.* Interpret expressions that represent a quantity in terms of its context.* • Interpret parts of an expression, such as terms, factors, and coefficients. • Interpret complicated expressions by viewing one or more of their parts as a single entity.	2 days

*"One day" is equal to one instructional period in a traditional schedule and would need to be adjusted to account for longer class periods in a block schedule.

Continued on next page →

Planning and Pacing Guide PG45

Planning and Pacing Guide
Broken out by lesson type, color-coded **Planning and Pacing Guides** walk you through each lesson, module, and unit by spotlighting the mathematics standards you'll be addressing, guiding you in determining the pace of your instruction, and calling out additional resources.



DATA-DRIVEN INTERVENTION MTSS RtI

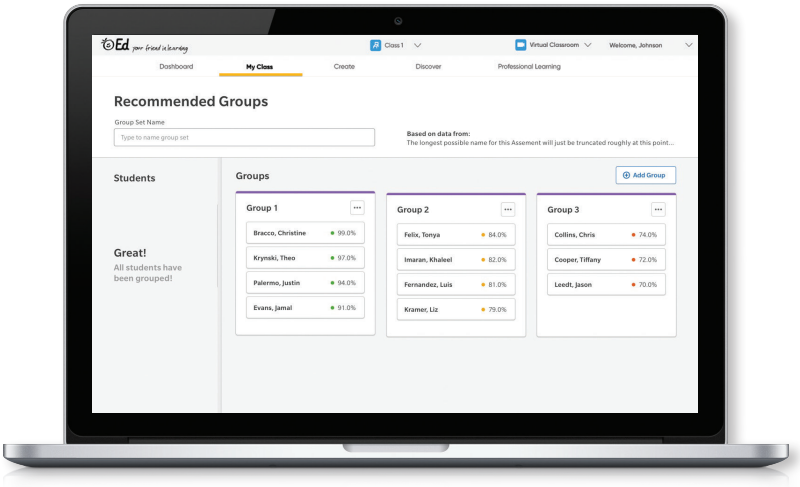
Concept/Skill	Objective	Prior Learning *	Intervene With
Equal Shares	Identify the number of equal shares of a whole.	Grade 2, Module 22	• Tier 3 Skill 21 • Reteach, Grade 2 Lessons 22.1–22.5
Fractions of a Whole	Determine the number of parts and the number of equal parts of a whole.	Grade 3, Lesson 13.1	• Tier 2 Skill 20 • Reteach, Grade 3 Lesson 13.1
Equivalent Fractions	Generate equivalent fractions.	Grade 3, Lesson 16.3	• Tier 2 Skill 17 • Reteach, Grade 3 Lesson 16.3

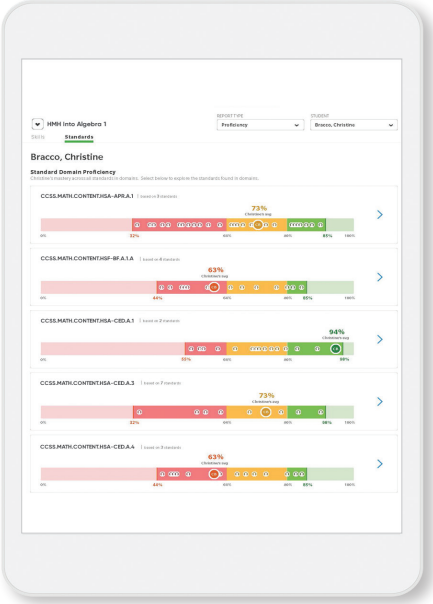
* Your digital materials include access to resources from Grades 2–6. The lessons referenced here contain a variety of resources you can use with students who need support with this content.

Data-Driven Intervention
Broken down by concept and skill, **Data-Driven Intervention** call-outs take the guesswork out of closing learning gaps before they take hold.

Actionable Data to Create **Exceptional Lessons**

Get a clear picture of where students are on their learning journey with actionable data that are valid and reliable. Comprehensive, real-time assessment data and interactive reports allow you to view your students' strengths and weaknesses as you plan for the resources they'll need.





Grouping Reports assist you in confidently grouping students based on data-driven recommendations. Resources and activities are easily assignable for each grouping.

Teachers, who know their students best, can quickly adjust groups with a simple drag-and-drop feature.

Interactive Reports allow you to drill down into the data to get a clear picture of how each student is performing in relation to grade-level proficiency, standards mastery, and his or her peers.

Equity through *Ed*

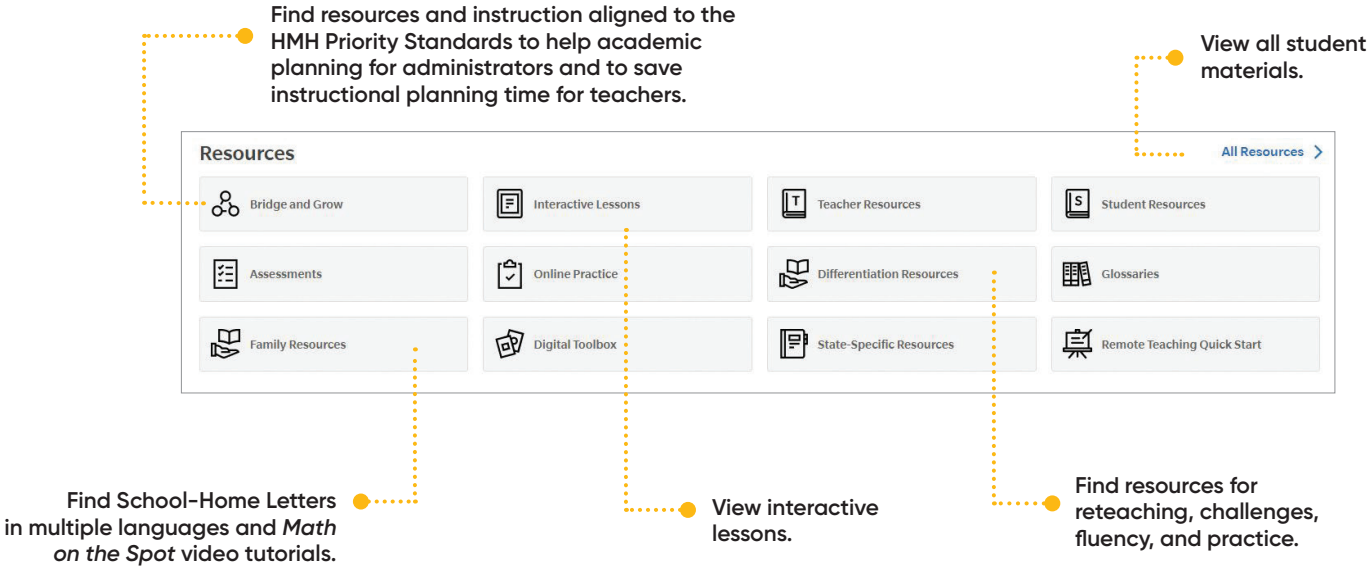
Ensure every student benefits from the resources, supports, and tools *Into AGA* provides with access to Spanish resources for Algebra 1 students and assessment resources for all levels. Teachers also gain access to multiple grade levels of content to support intervention and guide them in stretching student thinking on *Ed*.

Continuous Support at **Your Fingertips**

We're committed to ensuring your success with *Into AGA* throughout the year. You don't expect your students to master all their skills within the first week of school, and the same shouldn't be expected of you. That's why we've designed our professional learning to be ongoing, flexible, and actionable.

Whether you're a first-year mathematics teacher or a teaching veteran, *Into AGA* was designed to place learning opportunities at your fingertips every step of the way. From embedded professional learning to job-embedded coaching, experts from Math Solutions take the guesswork out of your implementation and ensure you and your students are successful with *Into AGA*.

***Ed's* Resources** are designed to support you in ensuring accessibility and achievement for all students.



Getting Started Builds Confidence: Teaching a new program can be overwhelming, especially when you have so many different resources at your fingertips. We know you can't take in every detail before you start teaching, so our Getting Started is streamlined to focus on preparing you for your first three weeks.

Follow along, explore the program online, and ask a Math Solutions coach questions when they come up.

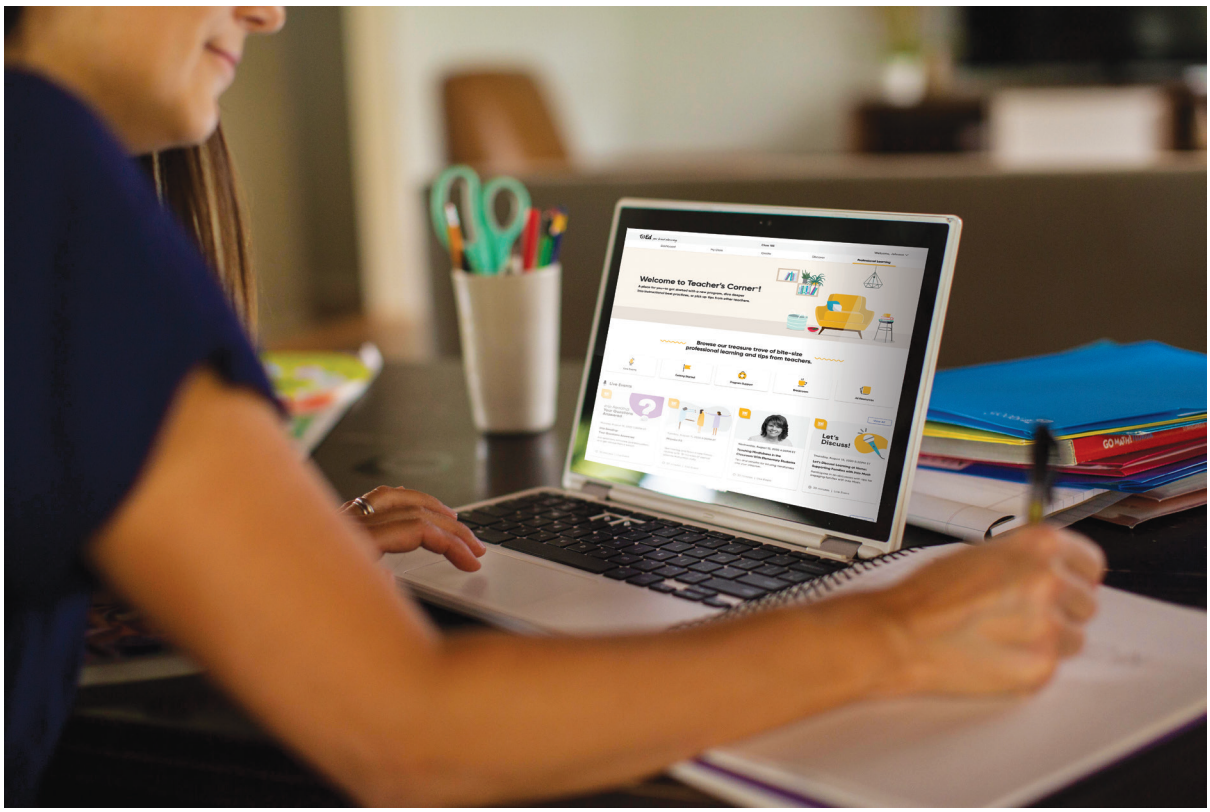
Math Solutions.
FOUNDED BY MARILYN BURNS

Follow-Up Tailored To Your Needs: Once you begin teaching, you'll have more questions and need more support. That's why we provide additional opportunities for you to connect with a Math Solutions coach throughout the year.

Follow-up topics range from support with instructional routines to differentiating instruction. These shorter sessions allow you to stay engaged and build your expertise in a manageable way.

Introducing
Teacher's Corner

Getting help or refining your practices isn't limited to scheduled trainings or coaching. With Teacher's Corner™, you have access to on-demand professional learning and teaching support via *Ed* anytime, anywhere.

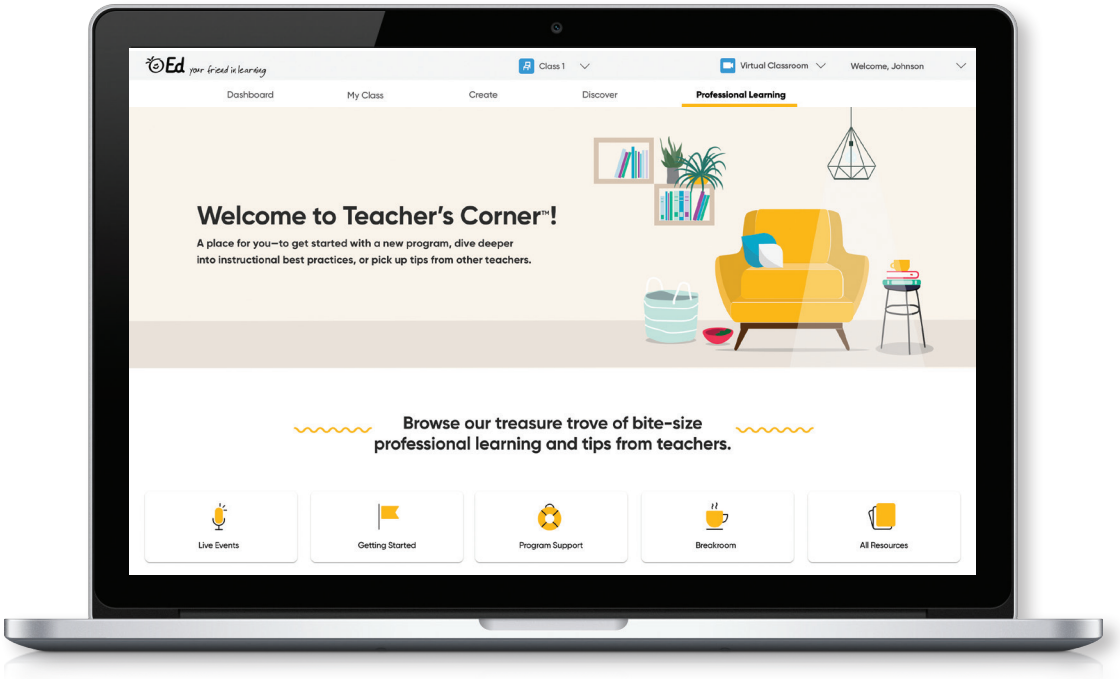


Teacher's Corner™

Welcome to Teacher's Corner—A Place Just for You.

We want you to feel confident teaching with our programs—and that comes with ongoing support. Teacher's Corner gives you the support you want with an ever-growing library of professional learning resources from authentic classroom videos to tips from others teacher and our team of experienced coaches.

So whether you want to quickly prep for a lesson or invest time in your professional growth, we have trusted resources to enhance your instruction and classroom tomorrow.



Curated, Trusted Content

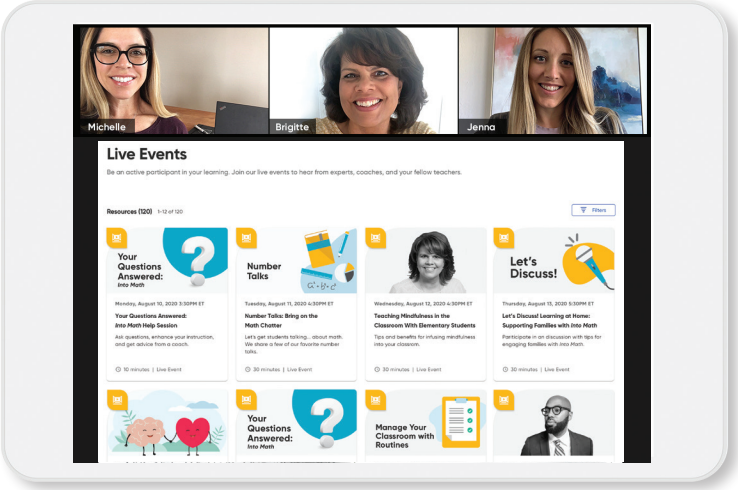
There's no shortage of free resources online, but with Teacher's Corner, professional learning and instructional recommendations align to research-based practices. Hear from prominent thought leaders, experienced coaches and former teachers, and practicing teachers.

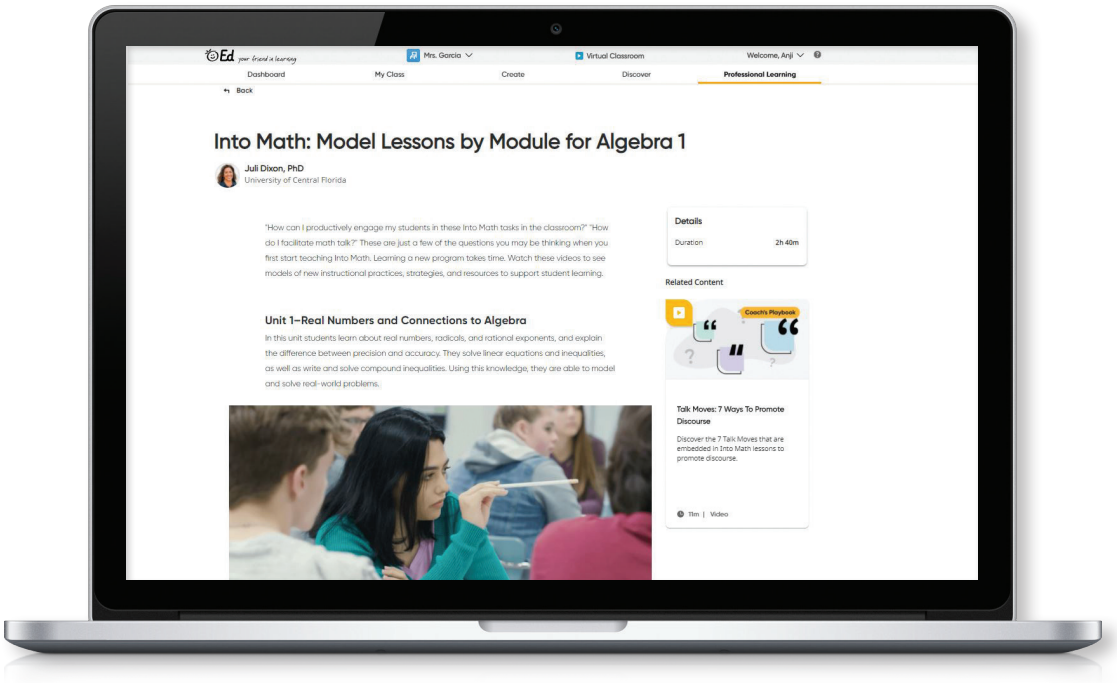
Relevant and Ready for Tomorrow's **Instruction**

Teacher's Corner includes authentic classroom videos and articles from teachers who are currently teaching with HMH programs. The number one teacher-requested resource, these videos will build teacher confidence and share how the programs can be tailored to each classroom's unique needs.

Professional Learning Videos show teachers how to facilitate Math Talk and guide students in Spark Your Learning tasks.

Live Community Support
Whether they have a question or want implementation advice, our Live Events offer teachers opportunities to connect with HMH coaches and each other. Teachers can register for these online sessions that feature everything from groundbreaking new author research to group discussions facilitated by other teachers.





Extend Your Professional Learning

Whether you are interested in focusing on instructional best practices, deepening your content knowledge at each grade level, or closing the achievement gap, Math Solutions can provide the support you need to grow your practice with online coaching, courses, and professional learning communities.

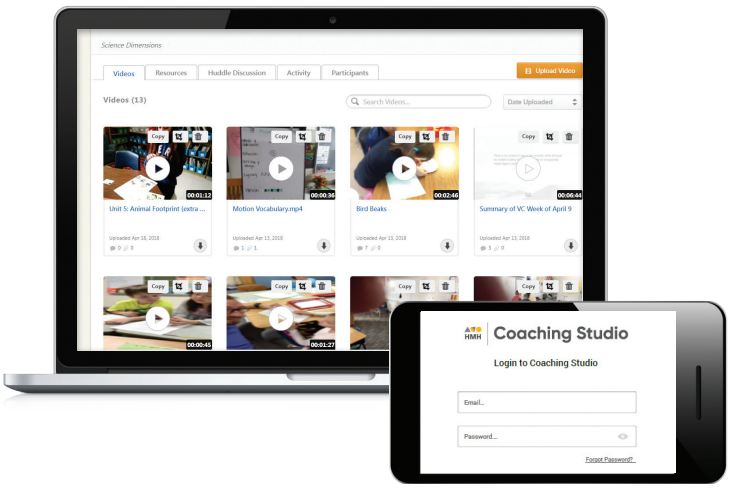
HMH Coaching Studio

Award-winning **HMH Coaching Studio** platform allows you to stay connected with your coach and your colleagues, share and upload resources, and access a library of on-demand lesson-modeling videos.

THE EDTECH AWARDS COOL TOOL FINALIST 2020

//CODiE// 2019 SIIA CODiE FINALIST

TECH & LEARNING AWARDS OF EXCELLENCE WINNER



Extend Fearless Problem Solving **beyond the Classroom**

As our country increasingly depends on STEM careers and competition builds for future jobs, we are focused on the bigger picture: extending fearless problem solving beyond the classroom.

Preparing our students to tackle the challenges ahead starts with a continual investment in you, their educators. *Into AGA* provides you with the tools you need to save time, simplify planning, and expand your ability to inspire young minds. You'll see learners become engaged as they master mathematical concepts and skills and discover the power of perseverance.

Let's get *Into AGA*!

HMH | into AGA™

A Vision for

Student Growth

Learn more about *Into AGA* at **hmhco.com/intoAGA**

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