



Grades K–8

Program Overview

Reveal
MATH[®]





Reveal**MATH**[®]



Learn more or request samples at
revealmath.com/K8

Reveal a World of Possibilities

A balanced core curriculum, *Reveal Math*® for K–8 develops the problem solvers of tomorrow by incorporating both activity-based and teacher-guided instructional strategies within each lesson. The program’s flexible structure reveals a world of possibilities—both for teachers as they determine which path to choose and for students as they discover math all around them throughout the journey.



Empowered Teachers Empower Students

Teachers possess unique insights into their students’ learning styles and needs, but varied demands on their limited time may prevent them from adjusting lesson plans accordingly. *Reveal Math* empowers them to play to their classroom’s strengths with two comprehensive instructional paths for each lesson. Robust supports and ready-made yet easily customizable resources ensure that both new and veteran educators can prep and teach their way—because when teachers succeed, their students excel.



Math for All

Math is everywhere, and it should be for everyone, no matter their learning background or ability. *Reveal Math* supports instructors in engaging every student with a variety of high-impact teaching strategies, including thoughtfully designed instructional routines, comprehensive MLL support, real-world activities with multiple entry points, and scaffolded differentiation resources—because we all deserve the opportunity to apply mathematics to our everyday lives.



Building Student Confidence

Math anxiety poses all too real an obstacle to students’ mathematical growth. *Reveal Math* fosters a supportive environment in which students feel safe taking learning risks and enjoy regular opportunities to try and try again. The program cultivates math confidence and growth mindset at every turn through instructional routines that build positive problem-solving habits and embedded “Math Is” strategies that equip every classroom for success, setting expectations and classroom norms to define math for students and teachers alike.

The *Reveal Math*[®] Authorship

McGraw Hill learning scientists teamed up with expert authors to create a K–8 program guided by validated academic research and classroom best practices.



Sarah Bush, Ph.D.

Expert in both theory and practice for middle school math instruction



Susie Katt, Ph.D.

Advocate for the unique needs of our youngest mathematicians



Ralph Connelly, Ph.D.

Authority on the development of early mathematical understanding



Ruth Harbin Miles, Ed.S.

Leader in developing teachers' math content and strategy knowledge



Annie Fetter

Advocate for eliciting student ideas to foster strong problem solvers—contributing author of Sense-Making Routines, page 11



Nicki Newton, Ed.D.

Expert in bringing student-focused strategies and workshops into the classroom—contributing author of the Game Station, page 15



Linda Gojak, M.Ed.

Expert in both theory and practice of strong mathematics instruction—contributing author of the Math Is... Unit, page 8



Georgina Rivera, M.Ed.

Expert in building student agency through culturally responsive teaching



Christa Jackson, Ph.D.

Advocate for strong STEM education and equity for middle school students



George Roy, Ph.D.

Expert in integrating technology into middle school instruction



John SanGiovanni, M.Ed.

Leader in understanding the mathematics needs of students and teachers—contributing author of the Math Is... Unit and Number Routines, pages 8 and 9



Cathy Seeley, Ed.D.

Thought leader and facilitator of high-quality mathematics education for all



Raj Shah, Ph.D.

Expert in both theory and practice of strong mathematics instruction—contributing author of the Ignite! activities, page 10



Jeff Shih, Ph.D.

Advocate for the importance of student knowledge



Cheryl Tobey, M.Ed.

Facilitator of strategies that drive informed instructional decisions—contributing author of Math Probes, page 25



Dinah Zike, M.Ed.

Creator of learning tools that make connections through visual and hands-on techniques—contributing author of Foldables®

Program Design

Influenced by Teachers, Researchers, and Industry Experts

Reveal Math® is a proven K–8 program crafted with the input of hundreds of educators across the country. Devised by McGraw Hill learning scientists in collaboration with the *Reveal Math* authorship team, the program applies educator insights to an instructional model based on validated, contemporary research on how students learn best. The latest ©2025 *Reveal Math* curriculum updates unify the K–5 and 6–8 experience, ensuring that students enjoy a cohesive math learning journey from Kindergarten up through Grade 8.

Major Focus Areas:

- **Equitable Classrooms:** Develop a classroom designed for all students with learner-focused practices. [See pages 11, 14–17.](#)
- **Math Mindset:** Empower academically and socially engaged classroom members. [See page 9.](#)
- **Metacognition:** Promote student reflection on their learning. [See pages 6 and 21.](#)
- **Sense-Making:** Support the development of sense-making and critical thinking skills to develop proficient problem solvers. [See pages 9 and 11.](#)
- **Rich Mathematical Discourse:** Facilitate use of the appropriate math vocabulary and constructive critique of classmates' math thinking. [See pages 6 and 14.](#)
- **Productive Struggle:** Engage students with mathematical ideas and relationships to build deep understanding. [See pages 10 and 20.](#)
- **Fluency:** Build automaticity through flexible practice strategies. [See page 26.](#)
- **Instructional Routines:** Encourage productive classroom interactions through structure and expectations. [See pages 9, 11, and 14.](#)
- **STEM Applications:** Practice and apply math skills in real-world STEM contexts. [See pages 12–13.](#)

A Blueprint for Student Mastery

The intentional design of *Reveal Math*[®] is built around the Standards for Mathematical Practice to support the development of mathematical thinking skills. Tightly aligned learning trajectories within and across the grades allow students to experience the coherence of mathematics while deepening conceptual understanding and refining procedural fluency.

Instructional routines, engaging sense-making activities, real-world examples, authentic tasks, and STEM applications are incorporated throughout to spark inquiry and help all students achieve growth in skills and knowledge.

Planning for Instruction

Every *Reveal Math* unit starts with a Unit Planner that provides a comprehensive overview of all activities and lesson information including the content objective, language objective, Math Mindset objective, key vocabulary, and standards. The progression of standards covered in every unit and lesson is explicit to demonstrate how topics connect and contribute to student mastery.


Putting the Math Practices in Action


Each lesson is connected to specific math practices identified in the Lesson Planner.


Math Is... prompts found throughout the lesson model the kinds of questions students can ask themselves to become proficient problem solvers and doers of math. Interspersed teacher guidance helps to support students as they employ the math practices and develop a problem-solving frame of mind.

Focus		
Content Objective <ul style="list-style-type: none">Students explain one meaning of multiplication: equal groups.	Language Objectives <ul style="list-style-type: none">Students describe multiplication equations using the term <i>equal groups</i>.To maximize linguistic and cognitive meta-awareness and optimize output, use MURJ: Collect and Display and MURJ: Critique, Correct, and Clarify.	Math Mindset Objective <ul style="list-style-type: none">Students actively listen without interruption as peers describe how they approached a complex mathematical task.
Coherence		
Previous <ul style="list-style-type: none">Students used repeated addition to find the total number of objects in rectangular arrays (Grade 2).	Now <ul style="list-style-type: none">Students explain that multiplication represents the total number of objects in equal groups.	Next <ul style="list-style-type: none">Students use arrays to represent multiplication (Unit 2).Students interpret multiplication as a comparison (Grade 4).
Rigor		
Conceptual Understanding <ul style="list-style-type: none">Students develop understanding of one meaning of multiplication as the total number of objects in equal groups.	Procedural Skill & Fluency <ul style="list-style-type: none">Students begin to build a foundation for fluency with multiplicative facts. <p><i>Procedural skill and fluency is not a targeted element of rigor for this standard.</i></p>	Application <ul style="list-style-type: none">Students begin to apply their understanding of multiplication to represent and solve real-world problems with equal groups. <p><i>Application is not a targeted element of rigor for this standard.</i></p>

Learn
How can you represent the number of peaches in the three baskets?



Each basket is one group.






Each peach is one object.


Each basket has the same number of peaches.
There are 3 **equal groups** with 5 objects in each group.
3 equal groups of 5
 $3 \times 5 = 15$

You can use **multiplication** to represent equal groups.

Math Is... Precision
Why is it important to say "equal groups"?

Work Together
Show equal groups? Explain how you know.



Sample answer: A, B, and C show equal groups because there is the same number of objects in each group.

4 Lesson 1 • Understand Equal Groups

Student-Centered Learning

The National Council of Teachers of Mathematics' eight Effective Teaching Practices guide instruction and discourse throughout each *Reveal Math*® lesson, keeping the student at the center of the learning.

ETP Effective Teaching Practices

Elicit and Use Evidence of Student Thinking

As students progress through the unit, ask them to explain their reasoning. Understanding the reasoning for their answers—whether they are correct or incorrect—allows for targeted instruction to reinforce and expand or enhance their understanding or address misconceptions and misunderstandings in a timely way.

As students learn about proportionality, there are multiple possibilities for errors in execution. Students may have misconceptions about

- the difference between proportional and nonproportional relationships;
- linear graphs that do not pass through the origin;
- common factors that define equivalent ratios and proportions.

Ask frequent questions, especially those that require reasoning. Use students' responses to inform instruction and determine what kinds of practice and review might be necessary.

For example, if students struggle to determine equivalent ratios or to identify the constant of proportionality, spend some time revisiting multiplication and division of fractions.

In Lessons 3-3, 3-4, and 3-5, students are introduced to proportional relationships. Monitor closely students' responses and thinking in these lessons to ensure they are understanding proportional relationships accurately.

Develop – Session 2 20 min

Continue with your selected option from Session 1.

Activity-Based Exploration

Activity Debrief

229 Critique, Correct, and Clarify: Critique a Partial or Flawed Response
Display a graph of $y = 2x + 5$ on the board.

- This line represents a proportional relationship because it is a straight line.

1. Prompt: Prompt students to analyze the statement in light of their own understanding, to identify the flaw in the statement, and propose an improved response.

2. Share: Students share with a classmate their revised statement and justification. Each student shares his or her responses while the other asks questions to clarify the justification.

3. Refine: Students revise and refine their revised statement based on feedback from their partner.

230 Facilitate Mathematical Discourse
Facilitate a whole-class discussion of the activities and Concluding Questions, reinforcing these key terms: *proportional*, *nonproportional*, and *constant of proportionality*. Ask:

- How can you identify the constant of proportionality from a graph?
- How can a graph tell you whether a relationship is proportional or not?
- What did you notice about the ratio of y to x ?
- What does the point $(0, 0)$ tell you about quantities that are in a proportional relationship?

231 Elicit Evidence of Student Understanding
As students discuss their thinking, listen for understanding of:

- For every point (x, y) on the graph of a proportional relationship, the ratio of $\frac{y}{x}$ is constant.
- Two quantities are in a proportional relationship if the graph of the ordered pairs is a straight line through the origin.
- On the graph of a proportional relationship, the constant of proportionality is both the constant ratio $\frac{y}{x}$ and the value of r in the point $(1, r)$.
- The meaning of $(0, 0)$ in the graph of a proportional relationship: When there is zero of one quantity, there will be zero of the other quantity.

Math is... Recognizing Repetition

- How can you use repetition to make a rule?

232 Invite students to describe what they notice about all lines that represent proportional relationships. Make sure that they understand if a line passes through the origin, it represents a proportional relationship. Students may also point out that each point on the graph changes by the same amount every time x changes by 1.

Have students review their responses to the Concluding Questions and make any adjustments based on the discussions with their partner and the class. Then encourage students to share their responses.

- How is the constant of proportionality represented on the graph of a proportional relationship?
- How can you use a graph to determine whether a relationship is proportional?

Multilingual Learner
Entering/Emerging Support justifications or explanations word bank that also include representations. Provide set such as: This graph ... represent proportional relationship be home language during discussion require revised responses in Developing/Expanding Re use because to introduce si and examples in their response to use How...? and Why...? a questions. While revising their advise them to consider why questions their partner ask **Bridging/Reaching** Have st because clauses in their res justification and to vary their within sentences. Also remind the lesson's academic language appropriate. Encourage th in partner's response and justify the discussion.

Unit 3 – Proportional Relationships

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Teacher guidance for employing Effective Teaching Practices is found throughout each unit and lesson in the Teacher Edition.

Ready-Made Curricular Resources

For teachers whose planning periods are never long enough, *Reveal Math*® saves precious time with ready-made curricular resources matched to standards and a clear daily routine and lesson model that also allows for choice and flexibility. Our goal is to support teachers in creating a positive and productive math classroom supported with high-quality content and easy-to-implement strategies for every day of teaching.

Ready-made curricular resources thoughtfully designed to lighten teachers' loads include:

- Engaging, interactive, prebuilt lesson presentations with embedded technology.
- Editable PowerPoint presentations that can be accessed and taught offline.
- Daily interactive practice in print or digital with embedded learning aids and dynamic (algorithmic) problems.
- Digital practice and assessment item banks to build custom assignments, including interactive item types.
- Math Replay videos to review lesson content—perfect for homework support.
- A robust selection of engaging differentiation resources—print, digital, and hands-on workstation activities—supporting independent or small-group work.
- Auto-recommended intervention to address prerequisite skill gaps at the beginning of each unit.
- Fluency activities and number routines to support teachers in building students' procedural fluency.
- Assessment tools and reporting to monitor progress and inform instructional decisions.
- An expansive library of professional learning workshops and videos, including expert insight videos.



Establish a Community of Learners

Math Is... Unit

The first unit in every grade is the **Math Is... Unit**, which aims to help students and teachers begin to understand math as a set of problem-solving strategies instead of an end result. The unit helps establish a productive and positive classroom environment where all students can:

- Define math in relation to their own experiences.
- Share ideas and collaborate freely.
- Find success in math and become doers of mathematics.
- Apply mathematical thinking and practices to problem solving.
- Take ownership of their personal learning journey.
- Become the creative problem solvers of tomorrow.

Summarize: Math is Mine
We are all doers of math and use math in our daily lives in ways that we may not realize. We all may do math differently. Sharing our math strengths with others helps us grow. Learning about the math strengths of others can help us grow, too.

Apply: A Sense of Belonging
We all have a need to feel like we belong to a community. Think about the different communities that you belong to.

Question What makes you feel like you belong to these different communities?

Complete the table below.

Community that I belong to	What I like about being in that community	How I feel when in that community	How ideas about community at our math class

40 Unit 1 • Math Is...

Summarize: Math is Ours
We are a community of math thinkers and doers. Sharing our math strengths with others helps us grow. Learning about the math strengths of others can help us grow, too.

When we do math as a community,

- we often work together.
- we sometimes work on our own.
- we show respect and consideration for our classmates and our community.
- we show respect for ourselves and our math ideas.

Apply: Community Agreements
Communities often have agreements that all members of the community must agree to in order to be a part of the community.

Question What ideas do you recommend that the whole class agrees to so that math class is a community of learners?

Answer the question in the space below.

40 Unit 1 • Math Is...

Math is Done with Others
How do we do math as a community?

When we do math, we often work together.

When we work together, we collaborate and support each other.

- We listen attentively to classmates.
- We share our thinking.
- We are respectful of others' ideas.
- We critique the ideas of others, not our classmates.
- We take turns when sharing ideas.

When we do math, we sometimes work on our own.

- We stay focused on our work.
- We seek help when we are stuck.
- We respect our classmates' boundaries and work habits.
- We avoid interrupting our classmates unnecessarily.

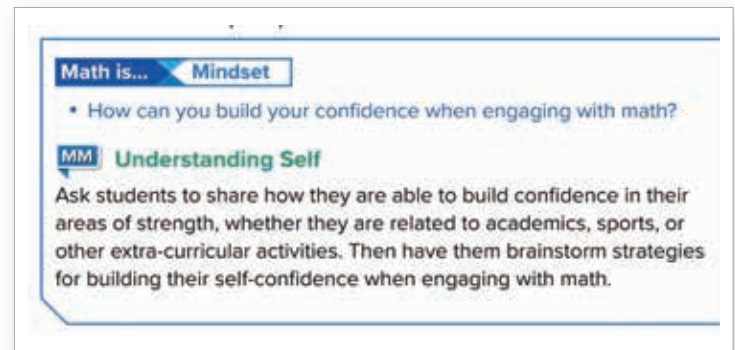
Let's Explore More
a. What skills and knowledge do you bring to a group that helps it be successful?

Lesson 1-6 • Math Is Ours 39

Student Edition Math Is... activities build confidence, promoting student agency and collaboration.

Math Is... Mindset

Math Is... Mindset prompts throughout each unit and lesson provide strategies for encouraging a growth mindset and productive approaches to problem solving as students interact with and discuss math content.



Developing Positive Math Habits

Intentional instructional routines are embedded within every *Reveal Math*® lesson to support a productive classroom where everyone has the time and mental space to build constructive math habits.

Build Fluency

Number Routines

support the development of fluency with targeted concepts, prerequisite skills, and mental math strategies at the start of every lesson.



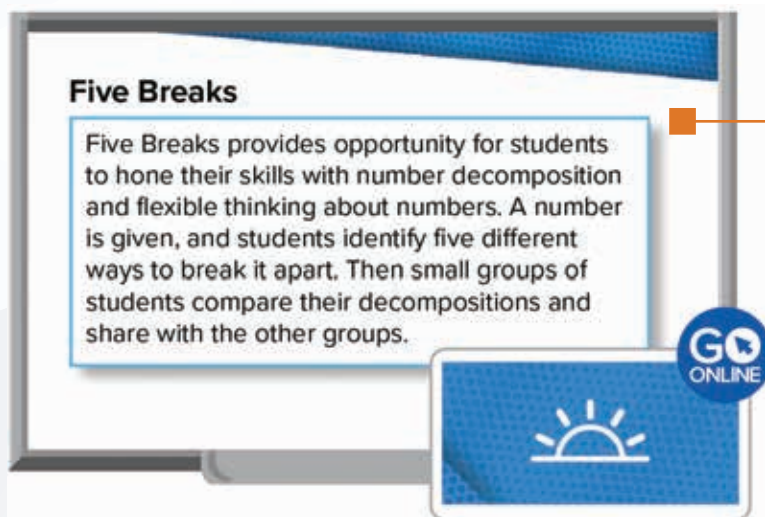
Sense-Making

Routines build conceptual understanding by making sense of mathematical concepts at the beginning of every lesson.

MLR

Math Language

Routines adjust the way students organize and communicate their own ideas and clarify the ideas of others throughout the lesson.



Number Routines support the development of flexibility with numbers and fluency with operations.

Spark Student Curiosity

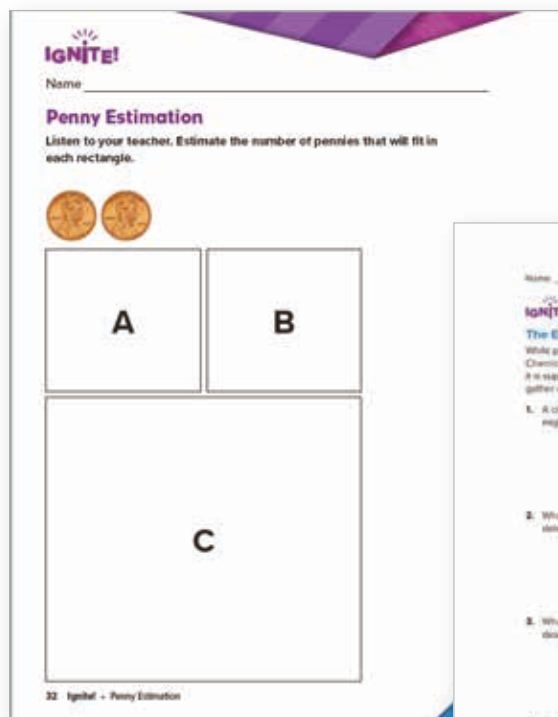
Ignite! Activities

Each *Reveal Math*® unit features a topic that students explore through the Unit Opener and the Ignite! activity, an interesting problem or puzzle that:

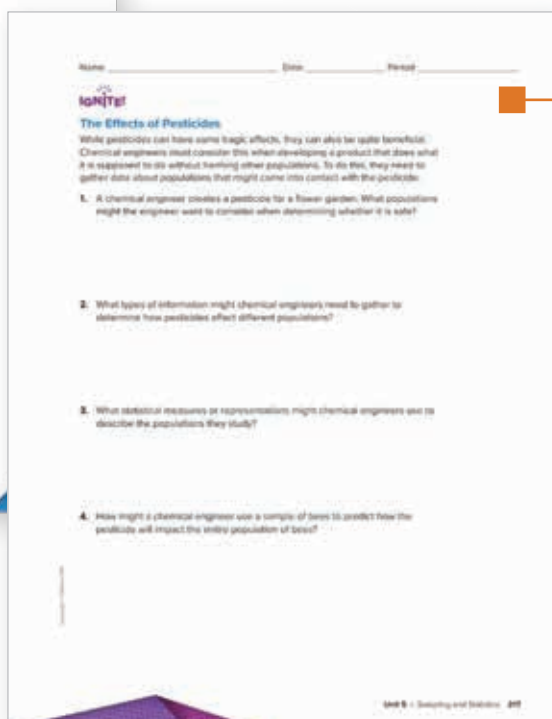
- Sparks students' interest and curiosity.
- Poses questions that motivate students to persevere through the challenges of problem solving.
- Provides only enough information to open up students' thinking.
- Supports productive struggle and facilitates discourse.

“Let’s bring curiosity, wonder, and joy back into the classroom and make math irresistible for kids.”

–Raj Shah, Ph.D.,
Contributing Author



K–5 Ignite!



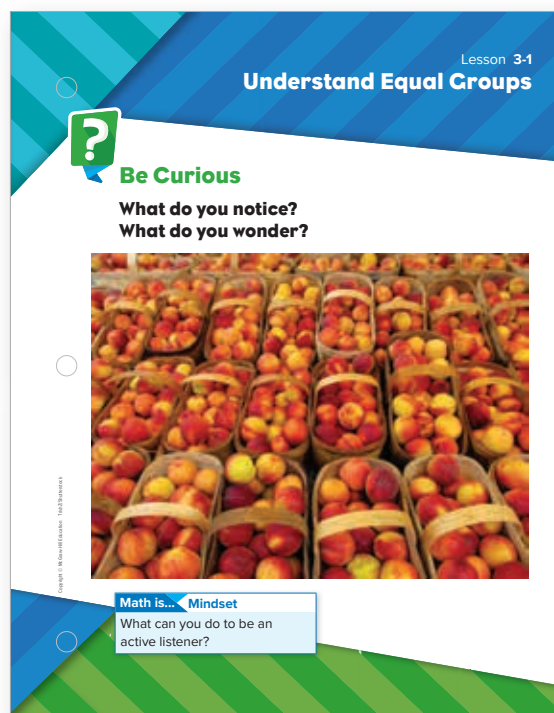
Ignite! activities engage students in productive struggle by providing only the information necessary to motivate and challenge them.

6–8 Ignite!

Use Questions to Promote Student Ideas

Each *Reveal Math*® lesson launches with Be Curious, a low-floor, high-ceiling sense-making activity with multiple entry points that helps create an equitable classroom culture where all ideas are welcome, respected, and celebrated. Student curiosity and ideas sparked by Be Curious serve as the foundation for that day's lesson.

Print



Digital



“All students have ideas about math that are valid and worth talking about.”

–Annie Fetter,
Contributing Author

Show Students the World Through STEM

Math is everywhere, and students should relate to math as something everyone does. STEM-focused units in *Reveal Math*[®] across Grades K–8 help students observe and understand the math taking place all around them.

Every unit and lesson provides multiple opportunities for students to engage in real-world, authentic tasks daily and elicits their wondering through opportunities to apply their own experiences to what they are learning.



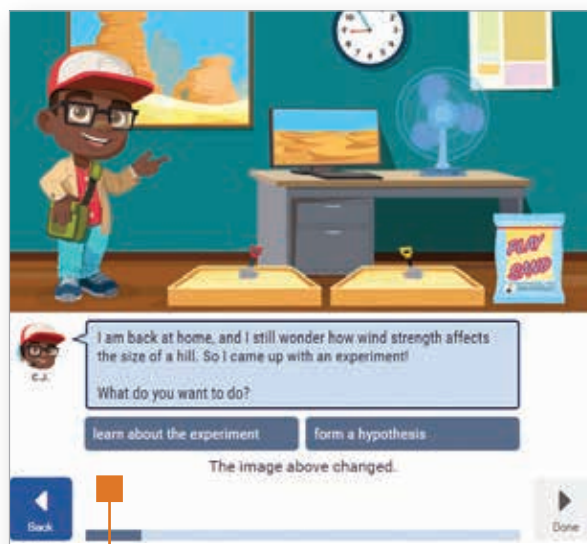
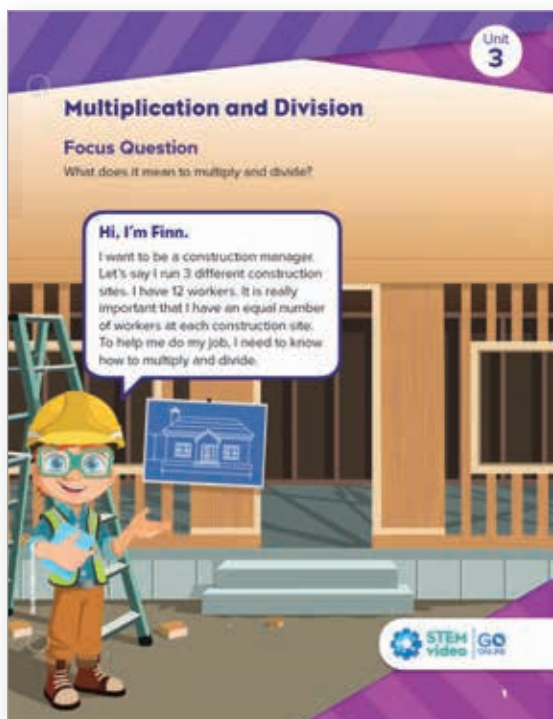
Each **K–5 STEM Career Kid** video introduces a STEM career and provides an overview of the job responsibilities.



The **K–5 Math in Action** videos apply the unit math content with a STEM-career focus to bring the content to the real world.



K–5 STEM Project Cards allow students to dig deeper creatively and apply their skills to learn more about the STEM focus within each unit.



During **K–5 STEM Adventures**, students engage in experiments with the STEM Career Kids, make hypotheses, and apply mathematical knowledge to analyze the data.

K–5 Units highlight careers and real-world applied math to help students see math as a tool to explore the world around them.

6–8 Units engage students in rich, contextual problem-solving tasks to explore real-world concepts through recognizable STEM scenarios.

Mathematical Modeling tasks at the end of each unit tie back to the STEM scenario and incorporate the Standards for Mathematical Practice. Students model with mathematics while utilizing data and appropriate tools to solve real-world problems and construct viable arguments to present to their peers.

6–8 Explore Through STEM identifies a STEM scenario in the Unit Opener to introduce a theme that will be revisited throughout the unit.

The collage features three main educational components:

- Textbook Page (Unit 3: Ratios and Rates):** Includes an "Essential Question" about unit rates and an "Explore Through STEM" section titled "Fish Farming" that discusses overfishing and fish farms.
- Mathematical Modeling Task:** Titled "Measuring and Comparing Air Quality," it includes a table for Air Quality Index (AQI) values and levels of health concern, and two line graphs showing average AQI by years for different locations.
- STEM Adventure Game Interface:** A digital screen showing a welcome message to the Fisheries Science Education Center, instructions on how to play, and a choice between "Fish Populations" and "Fish Farms" simulations.

Students in 6–8 can choose between two different **Mathematical Modeling** projects. Teacher support is provided through a guide for project development and facilitation.

6–8 STEM Adventures challenge students to apply new math concepts to real-world contexts via engaging digital experiments.

Make Math Accessible

Equitable teaching and learning practices are embedded throughout *Reveal Math*® to meet varied learning needs and enable teaching in multi-dimensional ways. Opportunities for multiple forms of engagement, representation, and expression allow all students to share ideas and input and become powerful users of mathematics.

Comprehensive Language Development Support

Multifaceted support helps teachers impart the language skills all students need to meet mathematical learning and language objectives and develop deeper conceptual understanding.

MLD

Math Language Development

Mini-lessons in every unit offer designated language support for English learners and can be taught at any time during the unit.

Language Objectives

In addition to a content objective, each lesson has a language objective that identifies a linguistic focus of the lesson for all learners. The language objective also identifies the math language routines of the lesson.

MLL

Multilingual Learner Scaffolds

Based on WIDA levels (Emerging, Expanding, and Bridging), these scaffolds provide instructional support in English language development as well as differentiated support in math.

LOM

Language of Math

The Language of Math promotes the development of key vocabulary terms that support how we talk about and think about math in the context of the lesson content.

MLR

Math Language Routines

Designed by Stanford Center for Assessment, Learning, and Equity, Math Language Routines appear in every lesson to support all students' language development and mathematical sense-making:

MLR1: Stronger and Clearer Each Time

MLR2: Collect and Display

MLR3: Critique, Correct, and Clarify

MLR4: Information Gap

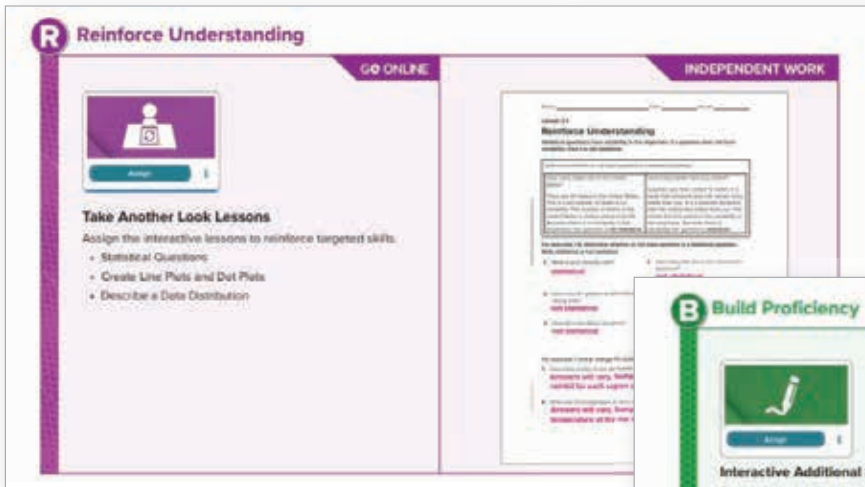
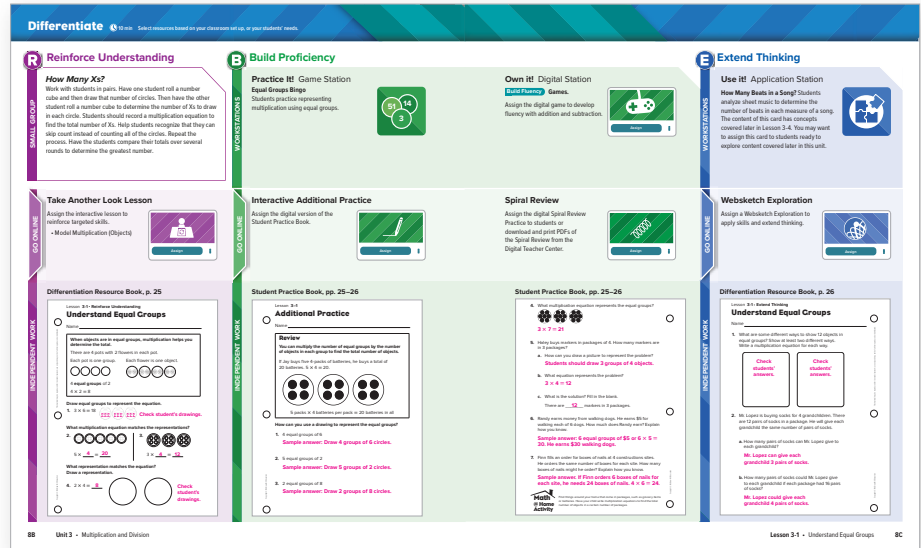
MLR5: Co-Craft Questions and Problems

MLR6: Three Reads

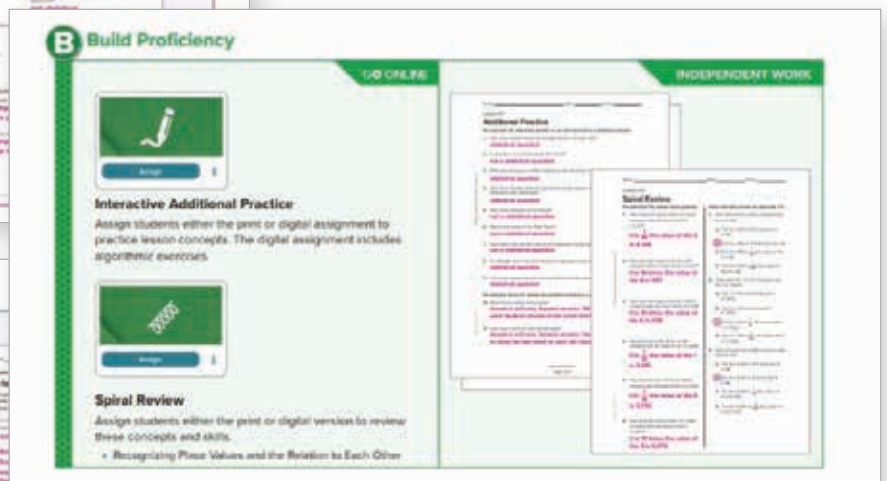
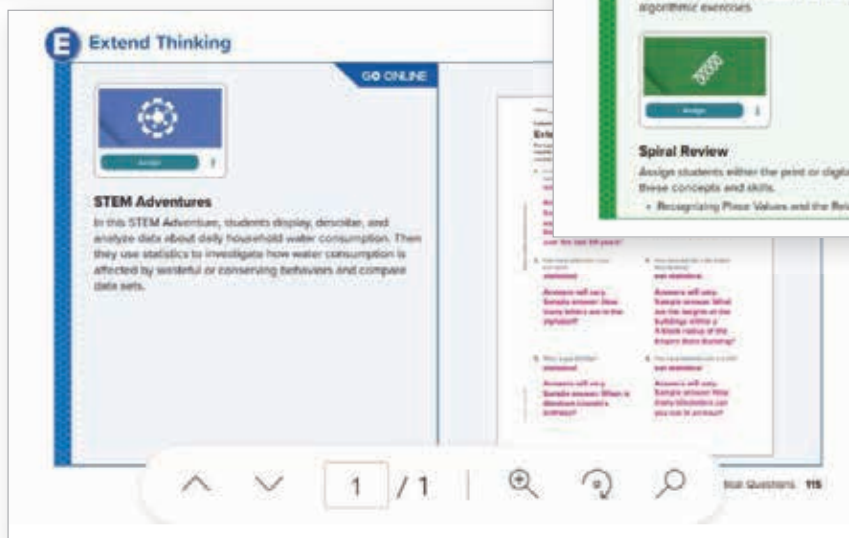
MLR7: Compare and Connect

Built-in Differentiation

Create purposeful learning moments driven by data. Daily differentiation within *Reveal Math*[®] provides a variety of engaging, multi-modal activities in different delivery options, empowering teachers to quickly and efficiently support every student in the area they need to focus on most for that lesson.



6–8 Differentiation Activities



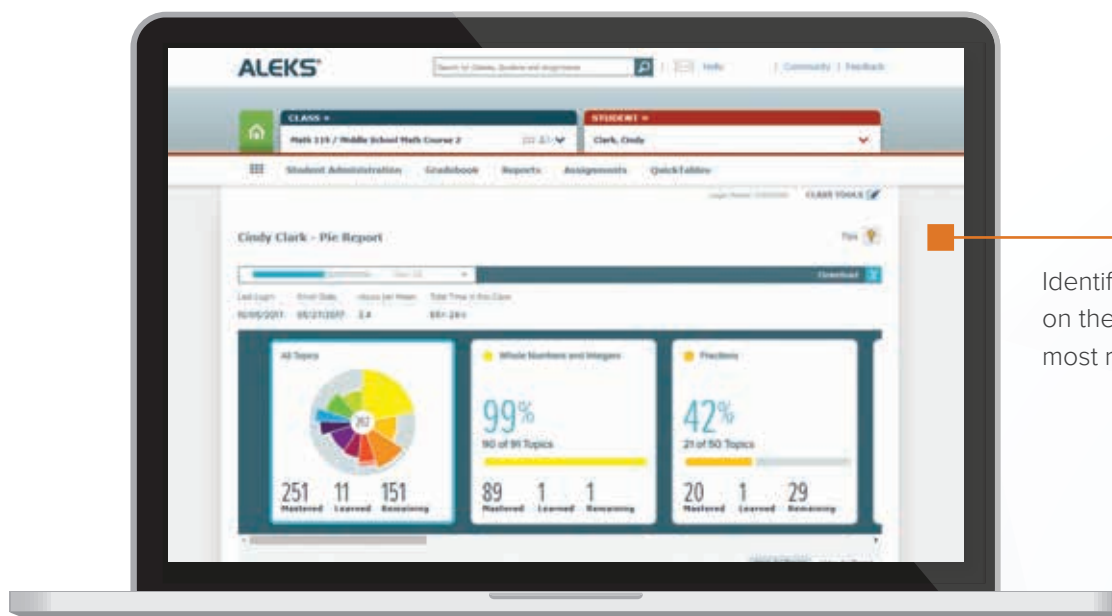
K–5 Differentiation Activities

ALEKS® Adaptive and Personalized Instruction

Designed to accompany *Reveal Math*®, ALEKS is an online math solution for Grades 3–12 that uses adaptive technology to identify and provide instruction on the topics each student is most ready to learn. Through a continuous cycle of assessment, learning, and reinforcement, ALEKS develops a personalized learning path for each student to ensure measurable success.

The artificially intelligent assessment and learning system is rooted in an adaptive approach that has proven to generate math confidence and measurable success for over 20 years. ALEKS accommodates the unique needs of all students and supports math instruction with features including:

- Periodic reassessment throughout the course to ensure that topics learned are also retained.
- Customizable course content to match teacher instruction.
- Lessons that support curriculum and grade-level objectives.

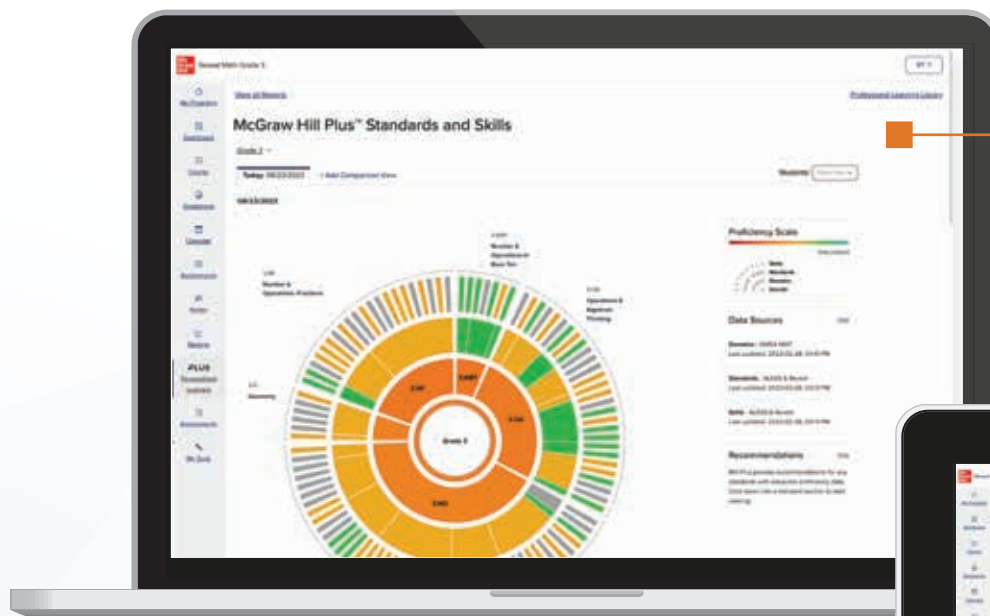


Identify and provide instruction on the topics each student is most ready to learn.

McGraw Hill Plus™: Charting Unique Paths to Growth

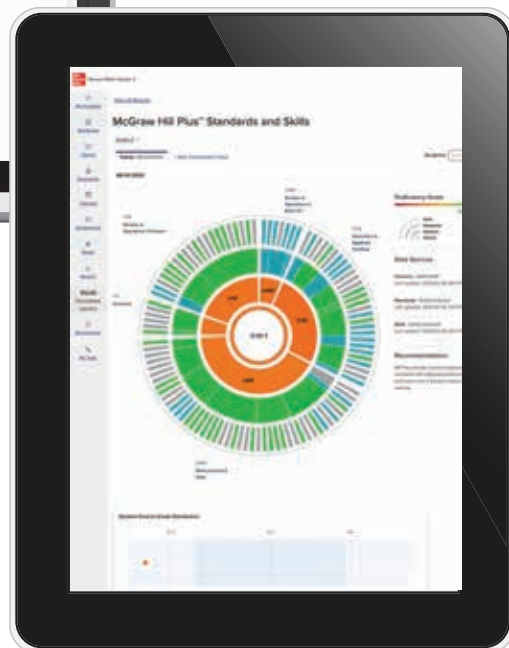
The McGraw Hill Plus™ data and assessment tool for PreK–12 simplifies teachers' daily workflow by connecting data from students' online learning interactions in *Reveal Math*® and ALEKS with interim assessment data to create a holistic picture of student learning in math through the **Standards and Skills Graph**.

Real-time insights aligned to standards and skills help teachers make data-driven decisions and support students' unique paths to math growth—and the data stays with each student from year to year. McGraw Hill Plus also surfaces skill-based **Personalized Learning Recommendations** at the time of need within the current *Reveal Math* lesson for individual students and provides turnkey **Small Group Teacher-Guided Lessons** for dynamic, proficiency-based student groups needing remediation, on-level, learning, and extension on every standard.



View of Data for the Entire Class

Make data-driven decisions based on a holistic view of student learning with the Standards and Skills Graph.



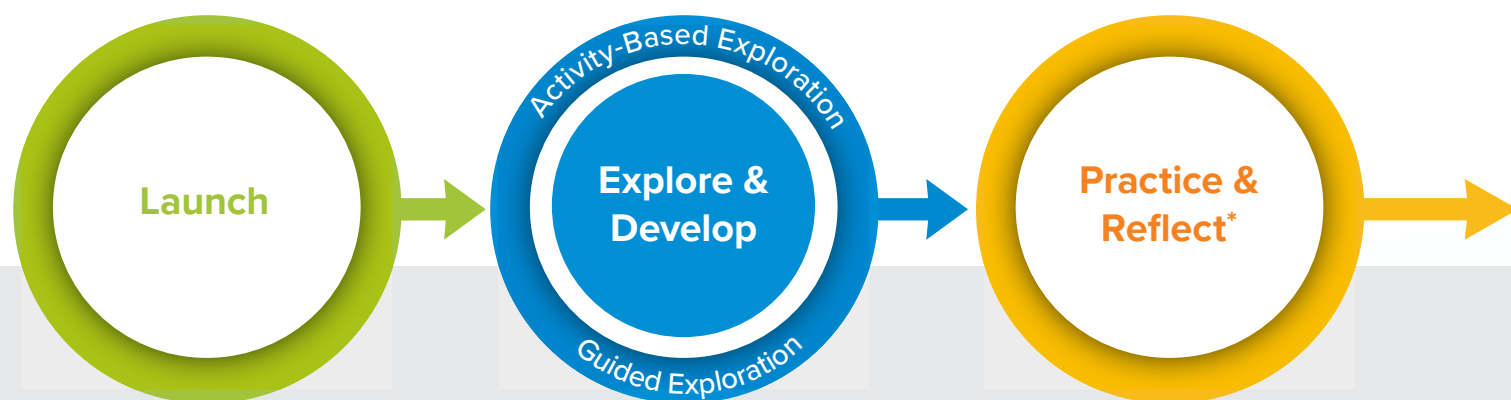
View for Individual Student Data

Flexible Paths for Instruction

Teach According to Your Students' Needs

The Lesson Model

The *Reveal Math*® lesson model keeps sense-making and exploration at the heart of learning. Teachers have their choice of two instructional strategies—activity-based or guided exploration—to facilitate student learning, develop the math content, and tailor lesson material to the needs and structure of their classroom. Both lesson options are present in the K–5 and 6–8 curriculum, ensuring a smooth transition from elementary to middle school.



Every lesson begins with **Be Curious**, a sense-making activity:

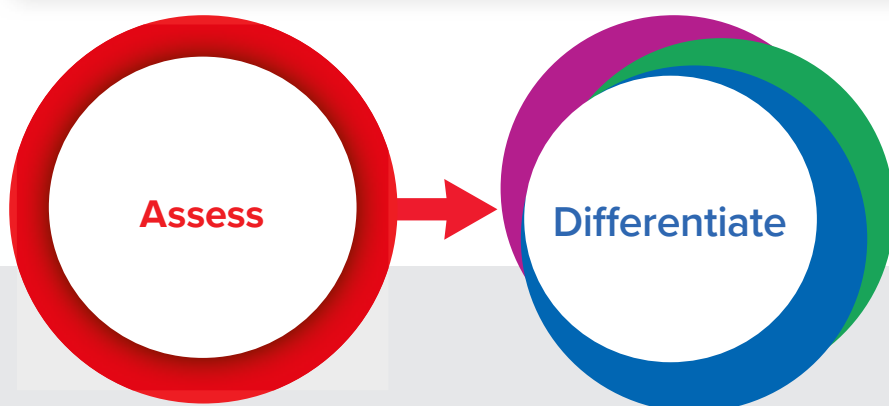
- Students focus on noticing and wondering, not problem-solving.
- Teachers foster students' ideas through meaningful discussion.

Explore & Develop unpacks the lesson content through Activity-Based or Guided Exploration:

- Students explore the lesson concepts and engage in meaningful discourse.
- Teachers utilize effective teaching practices to make meaningful connections.

- Students engage with the math and practice lesson concepts by completing exercises that address all elements of rigor.
- Teachers monitor progress and have students reflect on the lesson's learning targets.

**Both Reveal Math K–5 and 6–8 follow the five-step lesson model. The K–5 model is shown above with students engaging in Practice & Reflect as part of classroom instruction prior to Assess. The 6–8 model reverses these steps with Practice & Reflect taking place after Assess as independent student work. Grades 6–8 also divide the Explore & Develop into two sessions, whereas Grades K–5 have one session.*



- The **Exit Ticket** includes a daily formative assessment to check for understanding and inform instruction. Grades 6–8 include a second opportunity for formative assessment with a **Lesson Quiz**.
- Teachers use data to inform their daily differentiation.

Daily differentiation helps support every student in their path to understanding.

- Students work on differentiated tasks to reinforce their understanding, build their proficiency, and/or extend their thinking.
- Teachers pull small groups as needed.

Types of Differentiation

- R Reinforce Understanding**
Resources designed to revisit lesson concepts
- B Build Proficiency**
Resources to build proficiency with lesson skills
- E Extend Thinking**
Resources to enrich lesson concepts

Two Ways to Teach Every Lesson

Activity-Based Exploration

Students work together to explore concepts, develop and test hypotheses, and—most importantly—engage in productive struggle as they problem-solve and generalize learning. Options for hands-on or digital activities are provided.

Guided Exploration

Teachers facilitate exploration through thoughtful discourse and collaboration using an interactive, digital presentation.

Explore – Session 1 20 min

Launch Explore Assess Practice

CHOOSE YOUR OPTION

Activity-Based Exploration

Mixing Paint

Implement Tasks the Promote Reasoning and Problem Solving

Students explore different shades of green that can be made from mixing different amounts of blue and yellow paint. The goal is to have students notice that the ratio of blue to yellow paint will dictate the shade of green paint.

Students can work in pairs or small groups to carry out the task that they can complete in either the Digital Student Center or with paper and pencil.

Materials two-color counters (optional)

Support Productive Struggle

- What are some ways of getting different shades of green?
- How might the amount of blue and yellow paint mixed affect the shade of green?
- What do you notice about the amount of blue paint and yellow paint for each shade of green?

Math Is... Choosing Tools

- What tools might help you track the different shades of green?

Encourage students to record and track their different combinations of blue and yellow paint in a tool of their choosing.

Elicit Evidence of Student Thinking

Some students may approach this task by completing a table with descending values for the blue paint in one column and ascending values for the yellow paint in a second column. Make sure students see the corresponding amounts of blue and yellow paint as related and defining of a particular shade of green.

Activity Debrief

Collect and Display

As students share their findings and their tools, listen for and write on the board any key words they use. Display the words and phrases for student reference. Use the student-generated expressions to help make connections between student language and math vocabulary.

Facilitate Mathematical Discourse

As students come up with different shades of green, ask them to look for patterns with the amount of blue paint and yellow paint for each shade of green.

- How can you describe a specific shade of green?
- Why do you think different amounts of blue paint result in different shades of green?
- What would you need to do to make a lot of paint that is a specific shade of green?

Introduce the term *ratio*, *part-to-part*, and *part-to-whole* in the debrief. Show bar diagrams to represent the part-to-part and part-to-whole ratios. Say:

- For this shade of green, the ratio of blue paint to yellow paint is [1] to [2]. This bar diagram shows that relationship. What is the ratio of blue paint to yellow paint for this shade of green? These are both part-to-part ratios. That is, both blue paint and yellow paint are parts of the green paint.
- For this shade of green, the ratio of blue paint to green paint is [1] to [3]. This bar diagram shows that relationship. What is the ratio of blue paint to green paint for this shade of green? These are both part-to-whole ratios. That is, the blue paint is part of the green paint.

Activity-Based Exploration

Student Screen

Activity-Based printable available for this lesson. Download and print for students.

Multilingual Learner Scaffolds

Entering/Emerging Support students in understanding the meaning of bar diagrams. Show a picture of bar graphs, both horizontal and vertical and ask students to point to the bars in the graph. Then have them point to the bars in the bar diagrams.

Developing/Expanding Check that students understand the meaning of bar diagrams. Show them some bar diagrams, both horizontal and vertical and ask them to describe the graphs. Encourage them to use bars in their descriptions.

Bridging/Reaching Check students' understanding of bar diagrams. Ask them about other mathematical representations or models that have bars in them (bar graph) and to explain how the bars in the bar diagram are similar to those in the bar graph.

Guided Exploration

Pedro's Paint Mixture

Students explore the concept of ratios through a paint mixing situation. Introduce the problem situation. Have students consider why many hardware stores carry only white paint and create the exact color that a customer wants on the spot.

Pose Purposeful Questions

- Why might it be advantageous for a hardware store to carry only white paint and create specific color mixes that customers request?
- How would the hardware store be able to know that a color mixture matches the customer request?

Collaborate and Connect

For each of the different combinations of pieces of wood, have students work with a partner to determine whether the three pieces of wood can make a triangle. Ask:

- How do the three pieces of wood relate?

Collect and Display

As students discuss the questions, listen and write on the board any key words they use. Display the words and phrases for student reference. Use the student-generated expressions to help make connections between student language and math vocabulary. Update the collection with new understandings as the lesson progresses.

Use and Connect Mathematical Representations

- How does the blue paint relate to the green paint?
- What tools or models do you know that can represent this relationship?
- What do you think the bar diagram might look like? Draw the bar diagram.
- How are the different ways to write ratios related?

Students should notice that the terms are always in the same order.

Facilitate Meaningful Mathematical Discourse

- How can we represent a ratio?
- How can we describe a ratio?
- Explain why the blue paint to green paint is a part-to-whole ratio.
- How is the blue to yellow paint relationship different from the blue to green paint relationship?

Let's Explore More

Students work in partners or small groups to complete the questions. Check that students understand the difference between the blue to green and yellow to green ratio. Both are part-to-whole ratios, but use different parts.

Pedro's Paint Mixture

Pedro mixes the cans of paint shown to make green paint. How can you describe the relationship between blue paint and green paint? Between the blue paint and the yellow paint?

This is a **part-to-whole** relationship or ratio. 2 to 5 or 2:5 or $\frac{2}{5}$

This is a **part-to-part** relationship or ratio. 2 to 3 or 2:3 or $\frac{2}{3}$

Problemas uses 2 cans of blue paint to make 5 cans of green paint. The ratio of blue paint to green paint is 2 to 5.

Problemas uses 3 cans of yellow paint to make 5 cans of green paint. The ratio of yellow paint to green paint is 3 to 5.

Let's Explore More

1. What is the ratio of yellow paint to green paint? Write it in three different ways. 3 to 5, 3:5, $\frac{3}{5}$

2. What kind of ratio is the yellow paint to green paint relationship? **part-to-whole; The yellow paint is one part of the green paint (the whole). The other part is blue paint.**

3. Pedro changed the ratio of blue to yellow paint to be 3:2. Describe the relationship with words. **For every 3 parts yellow there are 2 parts blue.**

Student Edition, p. 7

Multilingual Learner Scaffolds

Entering/Emerging Support students in understanding the meaning of bar diagrams. Show a picture of bar graphs, both horizontal and vertical and ask students to point to the bars in the graph. Then have them point to the bars in the bar diagrams.

Developing/Expanding Check that students understand the meaning of bar diagrams. Show them some bar diagrams, both horizontal and vertical and ask them to describe the graphs. Encourage them to use bars in their descriptions.

Bridging/Reaching Check students' understanding of bar diagrams. Ask them about other mathematical representations or models that have bars in them (bar graph) and to explain how the bars in the bar diagram are similar to those in the bar graph.

Embedded within both instructional options are:

ETP Effective Teaching Practices

MLR Math Language Routines

MPP Math Practices and Processes

MLL Multilingual Learner Scaffolds


Practice & Reflect


Practice & Reflect provides students with the ability to engage in concepts independently to further understanding with questions that address all elements of rigor.

On My Own

Name _____

How many? Fill in the blanks.

1.  _____ equal groups of _____

2.  _____ equal groups of _____

How can you represent the equal groups?

3. 2 equal groups of 7


4. 4 equal groups of 5


How many objects?

5. 4 equal groups of 4 pencils
 $4 \times 4 =$ _____ pencils


6. 3 equal groups of 2 mittens
 $3 \times 2 =$ _____ mittens

What equation represents the equal groups?

7.  _____

8.  _____

9. **STEM Connection** Finn has 3 construction sites. He assigns 8 workers to each site. How many workers does he assign? Explain how you know.



K–5 Practice Page

Practice pages can be completed in the print Student Edition or eBook.

For exercises 5 and 6, use a graph, table, or equation to represent the proportional relationships. Then answer the questions.

5. A bagger at a grocery store earns \$48.75 for working 5 hours. How much would she earn for working 1 hour? 12 hours?

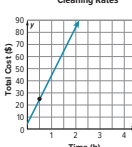
6. At the farmer's market, Hani paid \$3.99 for 3 pounds of bananas. How much would he pay for 5 pounds of bananas?

For exercises 7 and 8, answer the questions.

7. The equation $y = 2.54x$ represents the relationship between centimeters and inches. What is the constant of proportionality and how could you use it to find the number of centimeters in 50 inches?

8. **Error Analysis** The graph shows the fee scale for a cleaning service. A sales representative says that the service charges \$25 per hour for cleaning. What feedback would you give the sales representative?

Cleaning Rates



Reflect

Explain to a classmate how to determine if a relationship is proportional.

150 Unit 3 • Proportional Relationships

6–8 Practice Page


Additional practice is available online with algorithmic question functionality, which changes question values after each attempt and includes embedded learning aids.

Question 4 of 1

Question 4

Choose the correct answer.

Look at the visual models.



Which multiplication equation represents the equal groups?

☐ A) $2 \times 7 = 14$


☐ B) $3 \times 6 = 18$

☐ C) $3 \times 4 = 12$

☐ D) $4 \times 7 = 28$

☐ Need help with this question?

GO ONLINE



Math Replay videos provide a one- to two-minute explanation of the lesson concept for students to reference as they complete independent work.

Assessments to Monitor Student Understanding Throughout the Year

Reveal Math® offers a comprehensive set of assessment types that include diagnostic, formative, and summative tools.

Type	Assessment	When	Description
Diagnostic	Course Diagnostic	Beginning of Course	Diagnoses students' strengths and weaknesses with prerequisite concepts and skills for the upcoming year
	Unit Readiness Diagnostic	Start of the Unit	Evaluates students' knowledge of prerequisite concepts and skills for the upcoming unit
K–5 Formative	Work Together	During a Lesson	Assesses students' understanding of the concepts and skills presented in the Learn phase
	Exit Ticket	End of Each Lesson	Assesses students' conceptual understanding and procedural fluency with lesson concepts and skills
	Math Probe	During a Unit	Identifies common misconceptions
6–8 Formative	Exit Ticket	During a Lesson	Assesses students' understanding of the concepts and skills following the Explore phase
	Lesson Quiz	After a Lesson	Assesses students' conceptual understanding with lesson concepts and skills
	Math Probe	During a Unit	Identifies common misconceptions
Summative	Unit Assessment: Forms A and B	End of Unit	Evaluates students' understanding of concepts and skills learned in the unit
	Unit Performance Task	End of Unit	Measures students' ability to apply concepts and skills learned in the unit
	Benchmark Assessments	After Multiple Units	Assesses students' understanding of concepts and skills covering multiple units throughout the year
	Summative Assessment	End of Year	Evaluates students' mastery of course concepts and skills during the academic year

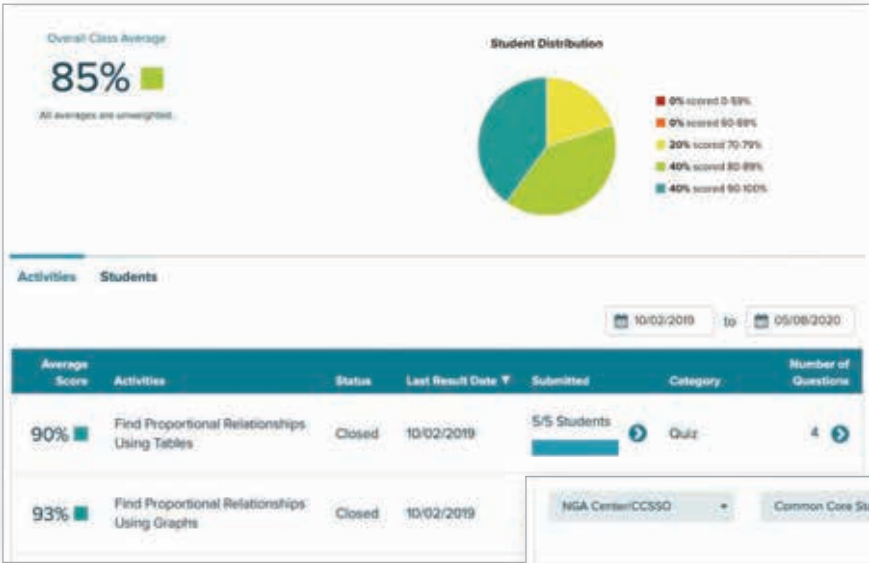
Print and Digital Formats

All assessments are available for either print or digital administration. Print assessments can be found in the **Assessment Resource Book** or as downloadable PDFs in the Digital Teacher Center. All digital assessment items, except for open response questions, are autoscored. Teachers can customize existing or create new assessments using additional item banks and item authoring tools.

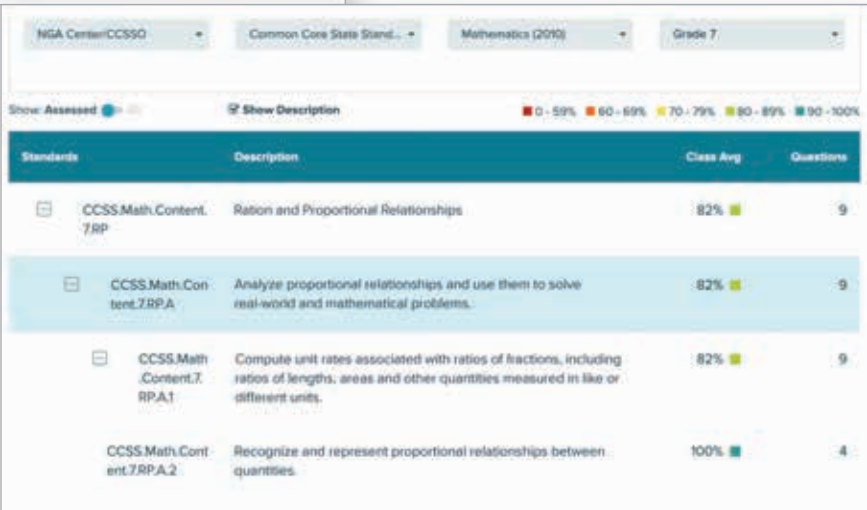
Actionable Reports

Performance reports found in the Digital Teacher Center provide immediate feedback to teachers, allowing them to make data-driven instructional decisions.

- **Activity Performance Report:** Teachers can review useful data points for class activities, including item analysis by student and class, as well as overall performance.
- **Standards Performance Report:** Teachers can access information on class performance by standard, including a cumulative score by class and student, as well as the number of questions answered.



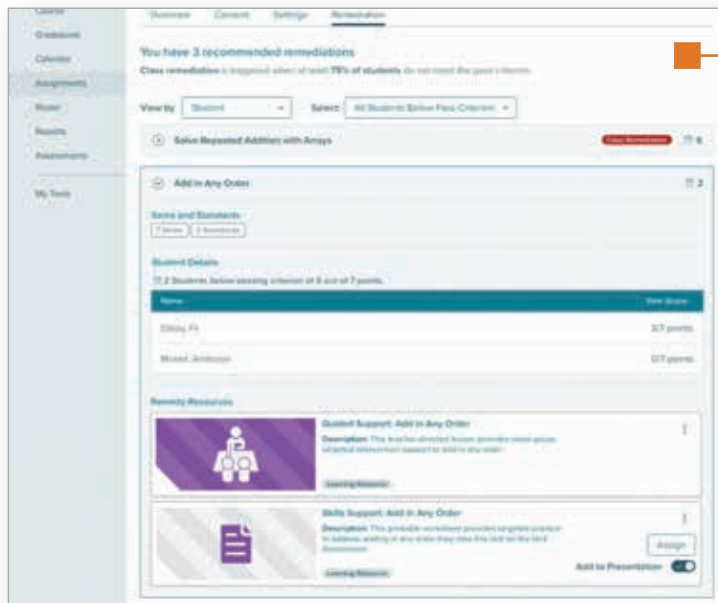
Activity Performance Report



Standards Performance Report

Auto-Recommended Intervention

The Readiness Diagnostic accesses and aligns with prerequisite skills that are critical to understanding the upcoming unit's content.



Data-informed remediations:

- Identify which student(s) need extra support on specific skills.
- Provide skill-based remedy resources with which to intervene.

Skills Support practice sheets provide targeted practice for previously taught items.

Equal Groups Word Problems (Equations)

Key Concept
Equal groups can help you solve multiplication and division word problems.

Rachel has 4 bowls. She puts 3 strawberries into each bowl.
How many strawberries altogether?

4 × 3 = ?

number of groups (bowls) number of items in each group (strawberries in each bowl) total number of items (total strawberries)

Rachel has 12 strawberries altogether.

Try It
There are 18 jars of peanut butter at the store. Each shelf holds 9 jars.
How many shelves are needed?

1 How many total jars of peanut butter are there? 18

2 How many jars can each shelf hold? 9

Guided Support

Materials

- Two-color counters (20 per student)
- Construction paper (5 pieces per student)

Begin the Activity

Tell students that they will be making groups of objects. Distribute the counters and construction paper.

Write the following: 4 groups of 3 equal 12. Display the multiplication equation: $4 \times 3 = 12$. Explain to students that the numbers being multiplied are called factors. The answer to the multiplication problem is called the product. Write these labels below the correct numbers in the equation. **What is the product in this example?** (12)

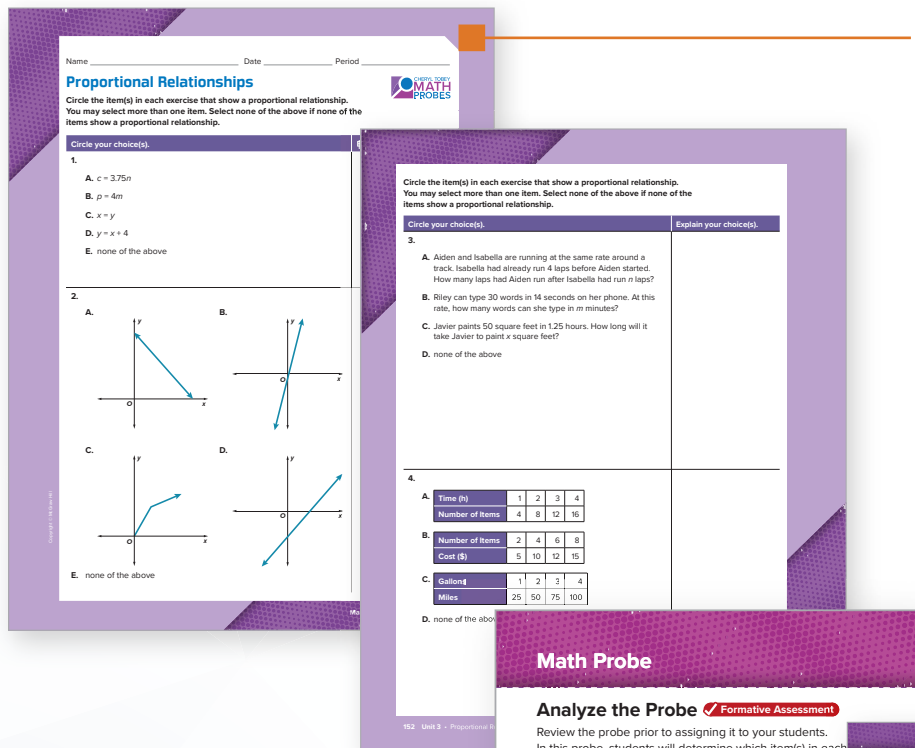
Underline 4 groups and 4 in the multiplication equation. Ask students to use 4 pieces of construction paper to represent 4 groups. Have them lay out the 4 pages.

Underline 3 and 3 in the equation. Explain that each group should have 3 objects. **How can you use counters to make groups of 3?** (Sample answer: I can put 3 counters on each piece of paper.)

Guided Support details a teacher-facilitated small group mini-lesson that uses concrete modeling and discussion to build conceptual understanding.

Recognize Misconceptions in the Moment

Math Probes written by Cheryl Tobey, M.Ed., a leading expert in formative assessment, are designed to uncover students' mathematical misconceptions within every unit. These probes, placed at point-of-use, allow teachers to make sound instructional choices while teaching students that mistakes are an opportunity for growth.



Short, Formative Assessment

Each Math Probe has three to four items that assess students' conceptual understanding. Each item consists of two parts:

- Part One assesses students' grasp of concepts.
- Part Two asks students to share their thought process and ideas.

Designed to ACT

The teacher support materials that accompany the Math Probes are designed around an **ACT cycle**—Analyze the Probe, Collect and Assess Student Work, and Take Action. Authentic student sample responses help identify the misconception. Provided remedies help teachers correct misconceptions quickly and efficiently.

Math Probe

Analyze the Probe ✓ Formative Assessment

Review the probe prior to assigning it to your students. In this probe, students will determine which item(s) in each proportional relationship and explain their choices.

Targeted Concept Understand proportional relationships equations, tables, and verbal descriptions in which there is ratio between two quantities.

Targeted Misconceptions

- Students may not recognize a proportional relationship given a form other than $y = mx + 0$.
- Students may incorrectly assume that any graph that is a straight line is proportional.

Authentic Student Work

Below are examples of correct student work and explanations.

Correct Example A

Time (h)	1	2	3	4
Number of Items	4	8	12	16

Number of Items	2	4	6	8
Cost (\$)	5	10	12	15

Gallons	1	2	3	4
Miles	25	50	75	100

Correct Example B

1. $c = 3.75n$	
2. $p = 4m$	
3. $x = y$	
4. $y = x + 4$	
5. none of the above	

Collect and Assess Student Work

If the student selects...	Check the student's reasoning.	Sample Misconceptions
1. a, b, and/or c	Does not understand that for a relationship to be proportional, y must equal 0 when $x = 0$, or may not recognize a proportional relationship when given a form other than $y = mx + 0$.	In this case, the student includes linear relationships shown in a and d.
2. a and/or d	Assumes that all linear relationships are proportional.	In this case, the student assumes a constant rate for square feet per minute.
3. a and/or c	Assumes that a constant rate of change automatically implies a proportional relationship.	In this case, the student assumes a constant rate for square feet per minute.
4. b or d; Does not select a and/or c	Does not understand that for a relationship to be proportional, each ratio has the same unit rate.	

Take Action

- Choose from the following resources or suggestions.
- Provide opportunities for students to see the same proportional context in a variety of representations in order to make connections between the various components of each representation in Lesson 3.
- Have students compare and contrast proportional relationships with non-proportional relationships to help them generalize the characteristics of a proportional relationship. Focus on the key features of the proportional relationships in Lesson 3.
- To help solidify concepts, have students create, represent, algebraically solve, and share their own problems involving contexts of proportionality in Lessons 4 and 5. This gives students the opportunity to observe key features in others' representations.

- Technology can enhance learning opportunities and allow students to concentrate on the connections between the various representations. Students will begin to see that key features of a graph look different based on the form of the written equation in Lesson 3.
- Revisit the Probe:** After additional instruction, have students review their initial answers to the probe. Use these questions for discussion.
 - What answers, if any, would you like to change? Why might you want to change them?
 - What questions do you still have about any of the items in this probe?

Fluency Supports

Fluency is not just about memorization; it's about having a working understanding and mastery of operations, relationships, and concepts. *Reveal Math*® provides teachers with tools to speak to all the elements of fluency throughout each unit.

Build Fluency Objective Students build fluency with decimals. As students work to develop fluency with adding, subtracting, multiplying, and dividing decimals, have them reflect on and share with classmates the strategies they find the most useful.

Fluency Progression

Unit	Skill	Standards
1	Division with Multi-Digit Decimals	6.NS.B.2
2	Fraction Multiplication and Division (no negative rational numbers)	6.NS.A.1
3	Apply Operations with Multi-Digit Decimals	6.NS.B.3
4	Finding Unit Rates Including Terms with Fractions	7.RP.A.1
5	Percent Increase and Percent Decrease	7.RP.A.3
6	Equations in Proportional Relationships	7.RP.A.2.C
7	Adding and Subtracting Positive and Negative Rational Numbers	7.NS.A.1
8	Multiplying and Dividing Positive and Negative Rational Numbers	7.NS.A.2
9	Two-Step Equations ($px + q = r$)	7.EE.B.4.A
10	Solving $p(x + q) = r$	7.EE.B.4.A

The **Fluency Objective and Progression** at the close of each unit helps teachers evaluate student progress.



Spiral Review and Digital Games provide ample practice of previously learned content to develop proficiency and fluency throughout the year.

Name _____ Date _____ Period _____

Fluency Practice

Fluency Strategy

Add or subtract decimals.	Multiply decimals.	Divide decimals.
Align the decimal points. Annex zeros, if needed. Add or subtract as with whole numbers.	Multiply. To place the decimal point, find the sum of the number of decimal places in each factor. The product has the same number of decimal places.	Multiply both the divisor and dividend by a power of 10 so that the divisor is a whole number. Divide. Place the decimal in the quotient directly above the decimal in the dividend.
$\begin{array}{r} 1 \\ 4.560 \\ + 13.246 \\ \hline 17.806 \end{array}$	$\begin{array}{r} 3.4 \\ \times 0.56 \\ \hline 204 \\ + 1700 \\ \hline 1.904 \end{array}$	$\begin{array}{r} 3.4 \\ 12 \overline{) 40.8} \\ \underline{36} \\ 48 \\ \underline{48} \\ 0 \end{array}$

Fluency Check

Add, subtract, multiply, or divide.

- $51 + 8.2 =$
- $7.68 - 1.49 =$
- $2.3 \times 1.4 =$
- $55.9 \div 13 =$
- $2.74 + 3.029 =$
- $2.5 - 0.586 =$
- $0.85 \times 0.09 =$
- $3.6 \div 0.09 =$

Fluency Talk

How would you describe the differences between operations with whole numbers and operations with decimal numbers to a classmate?

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Fluency Practice • Proportional Relationships • 165

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Fluency Practice

Fluency Strategy

You can use partial sums to find a sum.

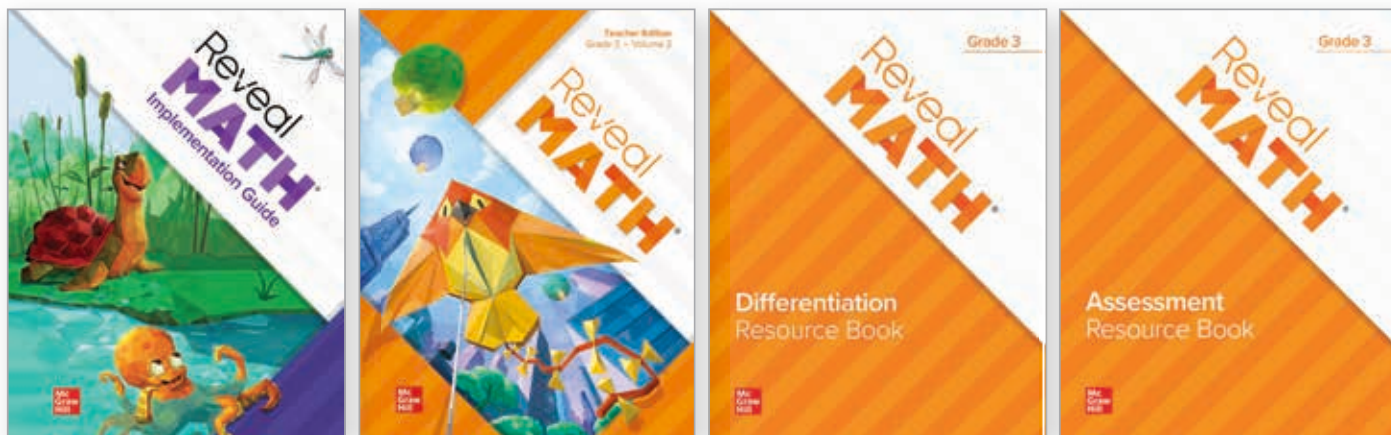
Partial Sums

$$\begin{array}{r} 253 \\ + 316 \\ \hline 569 \end{array}$$

$253 + 316 = 569$

Fluency Practice provides students with opportunities to build procedural fluency. Students will review the Fluency Strategy, complete the Fluency Check, then explain the mathematical strategy in the Fluency Talk.

K–5 Program Components: Teacher



Teacher Edition, Two Volumes



Workstation Kit

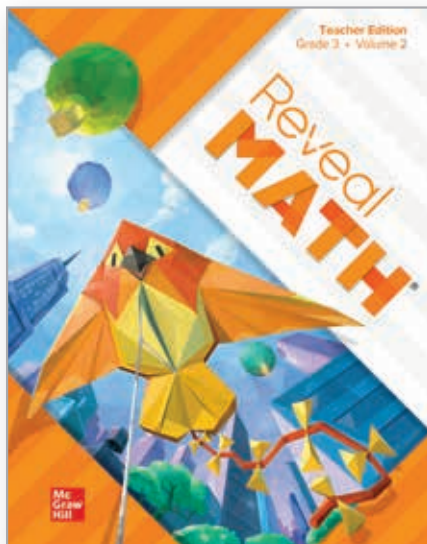
Application Station Cards

Teacher Digital Experience

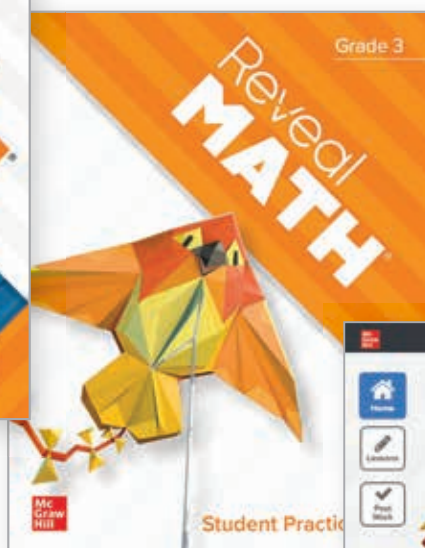
Teachers have access to an intuitive and easy-to-use platform for planning, teaching, and assessing student progress that includes:

- Interactive, prebuilt lesson presentations with embedded technology.
- Editable lesson presentations in PowerPoint.
- Engaging, rich differentiation resources.
- Digital practice and assessment item banks to build custom assignments.
- Teacher and administrator data and reporting.
- Professional development workshops and videos.
- Easily downloadable unit and lesson files.
- Classroom management and grouping tools.

K–5 Program Components: Student



Student Edition, Two Volumes



Student Practice Book

Student Digital Center

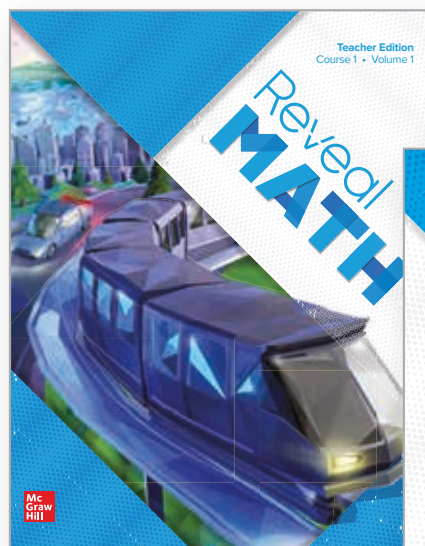


Student Digital Experience

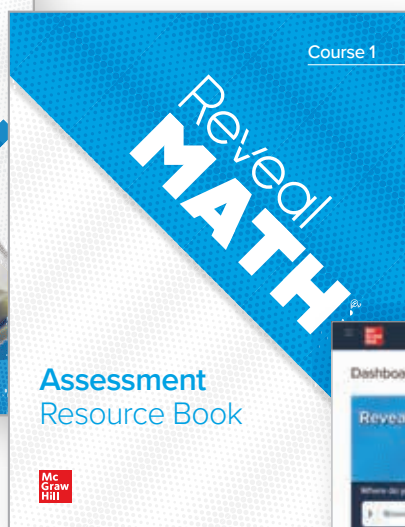
Students have access to a robust set of engaging digital tools and interactive learning aids, including:

- Interface designed for elementary students.
- An interactive Student Edition.
- Daily interactive practice with embedded learning aids.
- Online assessments with interactive item types.
- Digital games designed for purposeful practice.
- Instructional mini-lessons to reinforce understanding.
- Rich exploratory STEM Adventures.
- Visual and dynamic Web Sketchpad® activities.
- Animations, videos, and eTools.

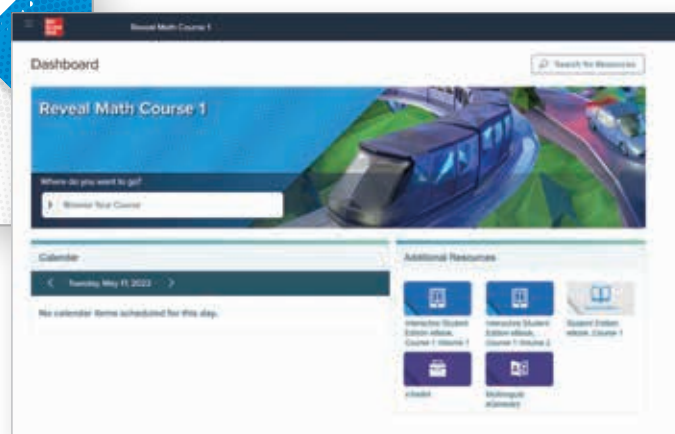
6–8 Program Components: Teacher



Teacher Edition, Two Volumes



Teacher Digital Center

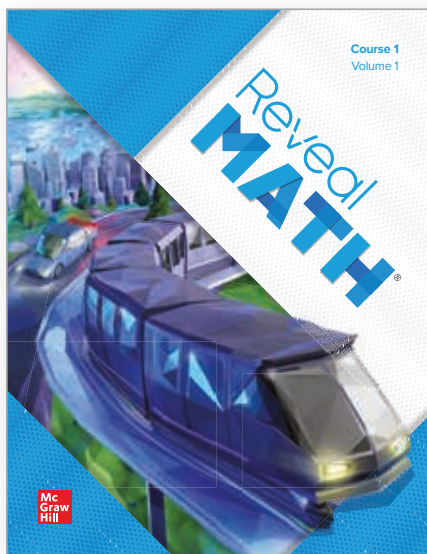


Teacher Digital Experience

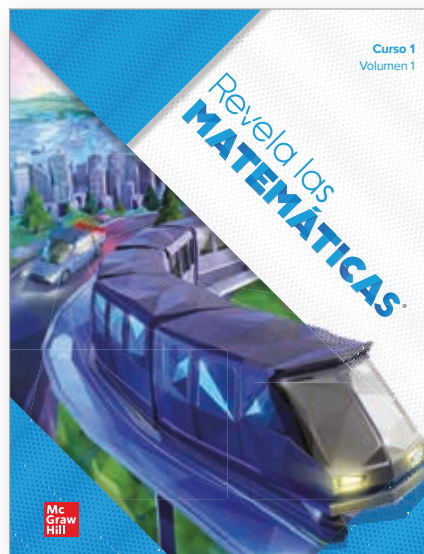
Teachers have access to an intuitive and easy-to-use platform for planning, teaching, and assessing student progress that includes:

- Interactive, prebuilt lesson presentations with embedded technology.
- Editable lesson presentations in PowerPoint.
- Professional development workshops and videos.
- Digital practice and assessment item banks to build custom assignments.
- Robust differentiation resources.
- Dynamic unit practice.
- Digital exploration activities powered by Web Sketchpad®.
- Anytime access to the eToolkit.
- Practice and assessment PDFs.
- Teacher and administrator data and reporting.
- Classroom management and grouping tools.
- A digital Implementation Guide.

6–8 Program Components: Student



Student Edition, Two Volumes



Spanish Student Edition, Two Volumes

Student Digital Experience

Students have access to a robust set of engaging digital tools and interactive learning aids, including:

- An interactive Student Edition.
- Daily interactive practice with embedded learning aids and dynamic (algorithmic) items.
- Dynamic, exploratory activities powered by Web Sketchpad®.
- Anytime access to a robust eToolkit (Virtual Manipulative Suite).
- Rich, exploratory STEM Adventures.
- Online assessments with interactive item types.
- Math Replay videos to review lesson content.
- Digital games designed for purposeful practice.

Notes

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page. In the bottom-left corner, there is a faint, light blue geometric pattern consisting of overlapping triangles and polygons. The rest of the page is plain white.

Notes

[illegible]

Notes

[illegible]

Reveal**MATH**[®]

Reveal a World of Possibilities
Learn more at **revealmath.com/K8**

