Access the Great Minds Digital Platform
to review *Eureka Math²* assessments, digital interactives, context videos, and more.

GREAT MINDS™

EUREKA MATH²®

Getting Started Guide

Mathematics I Module 1

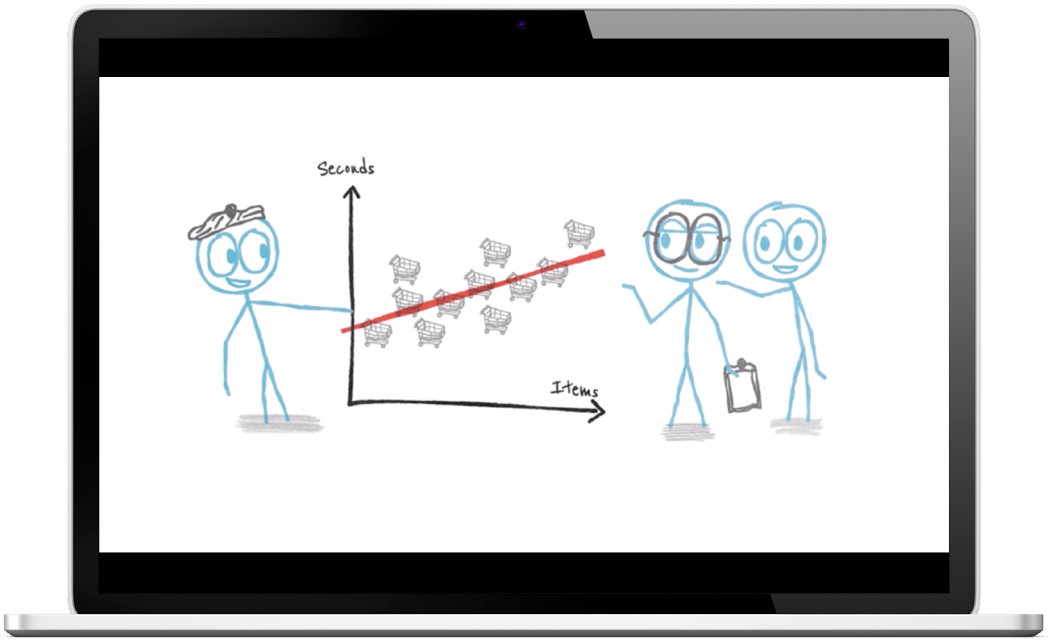
Getting *Started*

This Getting Started Guide provides contextual information as you review *Eureka Math*$^{2®}$. Follow along as we explore the contents of the *Teach*, *Learn*, and *Apply* books. The guide also highlights some **key components of the digital experience** that are seamlessly integrated into *Eureka Math*^{2}.

Exponentially *More*

Eureka Math® revolutionized math teaching in the United States. The curriculum has helped students understand the why behind the math, not just the how. It has become the most widely used K–5 math curriculum in the country—so why would we change it? Because we listened to feedback from our dedicated team of *Eureka Math* teachers throughout the country and studied the findings of current educational research. Armed with this knowledge, we decided to expand the accessibility and efficacy of our materials so that even more students can achieve greatness in math.

Eureka Math^2 is exponentially more efficient. Exponentially more engaging. Exponentially more accessible. And this adds up to exponentially more knowledge and joy for students and teachers alike.



Teachability^2 + *Engagement*^{2} + *Accessibility*^{2} = *Joy*^{2}

Thinking and Talking *About Math*

The teacher–writers who crafted *Eureka Math²* realize the value of student discourse. Starting in kindergarten, *Eureka Math²* students engage with the teacher and with one another to make their thinking visible. Students work in pairs and in groups as they engage in a variety of instructional routines and participate in whole class discussions to explore mathematical ideas. The Talking Tool, detailed on the inside cover of every *Learn* book, provides sentence frames and sentence starters to help guide student discourse.

Similar to the Talking Tool, the Thinking Tool, on the inside back cover of the *Learn* book, is a scaffold to support students in developing and applying metacognitive skills. It provides a set of questions students can ask themselves before, during, and after engaging in a task.

Thinking and talking about math help students better understand the topics they learn. These activities are key factors in creating an equitable classroom culture and helping students find the joy in mathematics.

How Students *Build Knowledge*

Eureka Math² is organized into three coherent stories that build from year to year: *A Story of Units*® for Grade Levels K–5, *A Story of Ratios*® for Grade Levels 6–8, and *A Story of Functions*® for Grade Levels 9–12.

Each grade level is organized into six modules. Within each module, related lessons are organized into topics. Mathematics I is unique as it is the first course of an integrated math series that reimagines high school courses where algebraic, geometric, and statistical thinking are integrated together in a single course.

A close look at the module map reveals that the major work of the grade level is delivered earlier in the school year. This allows students to have ample opportunities to establish strong foundational knowledge. *Eureka Math²* reinforces this knowledge later in the year by connecting supporting content to major grade-level work and providing students with real-world context.

Implement with Fidelity and *Confidence*

The same team of teacher–writers who crafted *Eureka Math²* also developed an Implementation Guide to help educators bring the curriculum into their classrooms. The guide provides a detailed map of the resources built into the curriculum and offers advice on preparing to teach each module. **Access the full Grade Level 6–Algebra I/Mathematics I Implementation Guide**.

Below we'll highlight some of the information covered in the Implementation Guide to help you explore *Eureka Math²* Mathematics I Module 1.

An Intentional and Meaningful Integration *of Digital Learning*

The *Eureka Math²* writers strategically integrated digital components within Grade Level 6–Algebra I/Mathematics I lessons so that technology enhances instruction and facilitates powerful mathematical conversations. The curriculum's digital platform includes teacher facilitation slides that display lesson visuals such as mathematical representations, images, videos, or digital interactives. Context videos that show an application of the module's math in real-life scenarios are integrated into the curriculum.

In addition to the wordless context videos and animations, Mathematics I incorporates dynamic digital lessons with the *Learn* content about once per topic. These lessons allow students to explore further on their own devices by building mathematical models, documenting their thinking, and sharing within the mathematical community. Digital lessons are semi-synchronous so students can experiment and reflect on their own and with peers before discussing as a class. As students document their thinking on the presentation slides, teachers can preview student responses on their devices. Teachers can then display chosen student screens to help facilitate class discussion.

Eureka Math² Equip™, a companion product to *Eureka Math²*, is a digital diagnostic tool that offers a Pre-Module Assessment for every student. It identifies learning gaps and provides teachers with tailored content to address them so all students can access grade-level content. Benchmark assessments are also available and provide a summative measure of the most essential content taught in the course up to a specific point in the program.

Access the Great Minds Digital Platform to review *Eureka Math²* assessments, digital interactives, context videos, and more.

Bringing Fine Art *into Math*

Among all math curricula, *Eureka Math²* is unique in its integration of fine art. The cover of each module features an impressive work of fine art that is visually or conceptually connected to the math. Mathematics I features the painting *Logarithms* by cartoonist Crockett Johnson, 1966, and a note on the inside cover helps students understand how the artwork is connected to the math they will learn.

A Map to the *Learning*

Every *Teach* book begins with an Overview. In Mathematics I Module 1, the Overview begins on page 2. The Overview pages note any previous knowledge students use and build upon in the module, summarize the student learning taking place in each topic in the module, and show where in the curriculum students will next access the module's learning to build new layers of understanding and more complex knowledge.

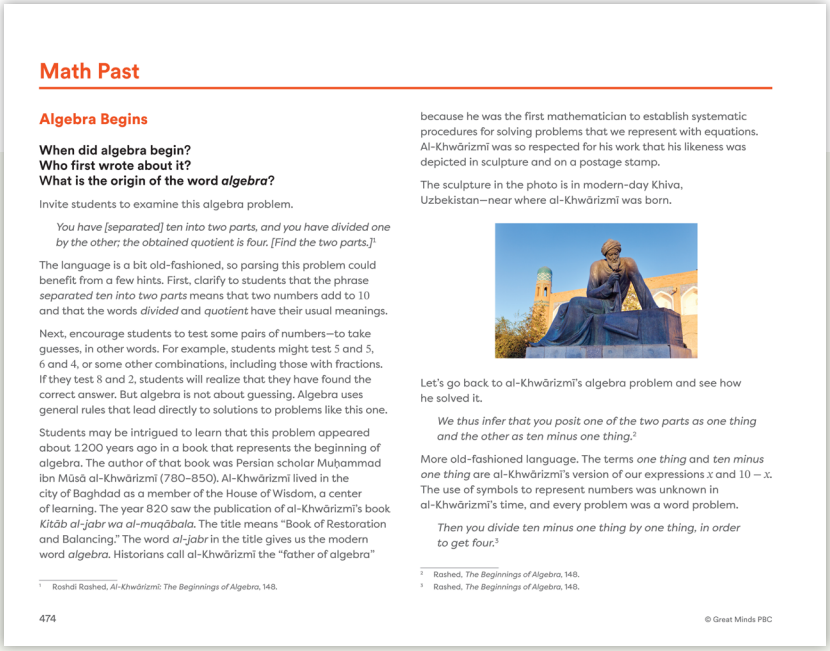
Following the Overview is the Why section. The Why section gives insight into the decisions made during the writing of the module, helping you understand the underlying structure of the module, the flow of the content, and the coherence of the different parts of the curriculum.

What Does Understanding *Look Like?*

Beginning on page 10, the *Teach* book highlights the Achievement Descriptors addressed in the module. Achievement Descriptors are clear, concise, standards-aligned descriptions that detail what students should know and be able to do based on the instruction. The first page of each lesson identifies the Achievement Descriptors aligned with that lesson. Proficiency Indicators for each Achievement Descriptor support teachers in interpreting student work in the module. The Proficiency Indicators begin on page 456 in the Mathematics I Module 1 *Teach* book.

History *of the Math*

Math Past is another way that *Eureka Math*^{2} helps students build knowledge—by telling the history of some of the big ideas that shape the mathematics in the module. Math Past frames mathematics as a human endeavor by telling the story of the discipline through artifacts, discoveries, and other contributions from cultures around the world. Math Past provides material that can inform your teaching and offers lesson-specific ideas about engaging students in the history of mathematics. The Math Past summary for Mathematics I Module 1 begins on page 474 of the *Teach* book.



Math Past

Algebra Begins

When did algebra begin?
Who first wrote about it?
What is the origin of the word *algebra*?

Invite students to examine this algebra problem.

> *You have [separated] ten into two parts, and you have divided one by the other; the obtained quotient is four. [Find the two parts.]*[1]

The language is a bit old-fashioned, so parsing this problem could benefit from a few hints. First, clarify to students that the phrase *separated ten into two parts* means that two numbers add to 10 and that the words *divided* and *quotient* have their usual meanings.

Next, encourage students to test some pairs of numbers—to take guesses, in other words. For example, students might test 5 and 5, 6 and 4, or some other combinations, including those with fractions. If they test 8 and 2, students will realize that they have found the correct answer. But algebra is not about guessing. Algebra uses general rules that lead directly to solutions to problems like this one.

Students may be intrigued to learn that this problem appeared about 1200 years ago in a book that represents the beginning of algebra. The author of that book was Persian scholar Muḥammad ibn Mūsā al-Khwārizmī (780–850). Al-Khwārizmī lived in the city of Baghdad as a member of the House of Wisdom, a center of learning. The year 820 saw the publication of al-Khwārizmī's book *Kitāb al-jabr wa al-muqābala*. The title means "Book of Restoration and Balancing." The word *al-jabr* in the title gives us the modern word *algebra*. Historians call al-Khwārizmī the "father of algebra" because he was the first mathematician to establish systematic procedures for solving problems that we represent with equations. Al-Khwārizmī was so respected for his work that his likeness was depicted in sculpture and on a postage stamp.

The sculpture in the photo is in modern-day Khiva, Uzbekistan—near where al-Khwārizmī was born.

Let's go back to al-Khwārizmī's algebra problem and see how he solved it.

> *We thus infer that you posit one of the two parts as one thing and the other as ten minus one thing.*[2]

More old-fashioned language. The terms *one thing* and *ten minus one thing* are al-Khwārizmī's version of our expressions x and $10 - x$. The use of symbols to represent numbers was unknown in al-Khwārizmī's time, and every problem was a word problem.

> *Then you divide ten minus one thing by one thing, in order to get four.*[3]

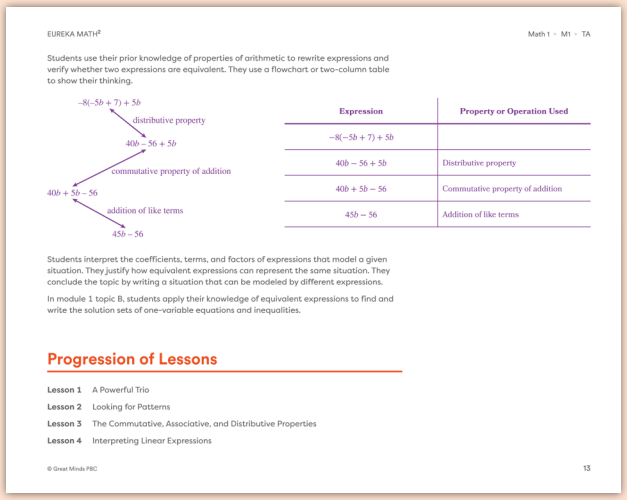
[1] Roshdi Rashed, *Al-Khwārizmī: The Beginnings of Algebra*, 148.
[2] Rashed, *The Beginnings of Algebra*, 148.
[3] Rashed, *The Beginnings of Algebra*, 148.

474

Dive into a *Topic*

It's time to dive into a topic to better understand the *Eureka Math²* learning design. On page 12 in the Mathematics I Module 1 *Teach* book, we begin with Topic A: The Structure of Expressions. Every topic begins with an overview summarizing the expected development as students engage with the upcoming content. In the Topic A overview, the teacher can see that students solve a real-world problem using a solution path that they determine, describe patterns using words or algebraic expressions, and generate different expressions to represent a given situation. There is also a brief Progression of Lessons list on page 13 in the *Teach* book to help teachers better understand the sequencing of the lessons within Topic A.

Students begin each new topic in the *Learn* book with a Topic Opener, an illustration created in collaboration with Ben Orlin, the author and illustrator of Math with Bad Drawings. The Topic Opener is designed to build anticipation for math by piquing curiosity in a humorous context. In Mathematics I Module 1 Topic A, this feature starts on page 5 of the *Learn* book.



EUREKA MATH² Math I • M1 • TA

Students use their prior knowledge of properties of arithmetic to rewrite expressions and verify whether two expressions are equivalent. They use a flowchart or two-column table to show their thinking.

Expression	Property or Operation Used
$-8(-5b + 7) + 5b$	
$40b - 56 + 5b$	Distributive property
$40b + 5b - 56$	Commutative property of addition
$45b - 56$	Addition of like terms

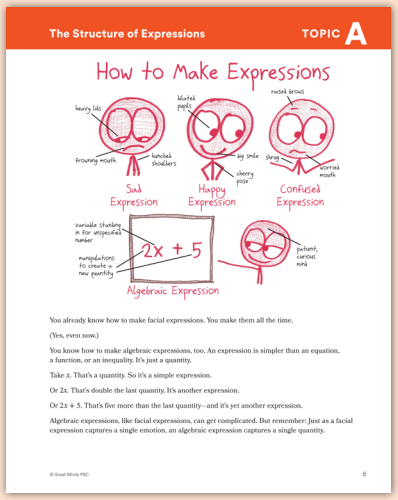
Students interpret the coefficients, terms, and factors of expressions that model a given situation. They justify how equivalent expressions can represent the same situation. They conclude the topic by writing a situation that can be modeled by different expressions.

In module 1 topic B, students apply their knowledge of equivalent expressions to find and write the solution sets of one-variable equations and inequalities.

Progression of Lessons

Lesson 1 A Powerful Trio
Lesson 2 Looking for Patterns
Lesson 3 The Commutative, Associative, and Distributive Properties
Lesson 4 Interpreting Linear Expressions

 13



The Structure of Expressions TOPIC A

How to Make Expressions

You already know how to make facial expressions. You make them all the time.

(Yes, even now.)

You know how to make algebraic expressions, too. An expression is simpler than an equation, a function, or an inequality. It's just a quantity.

Take x. That's a quantity. So it's a simple expression.

Or $2x$. That's double the last quantity. It's another expression.

Or $2x + 5$. That's five more than the last quantity—and it's yet another expression.

Algebraic expressions, like facial expressions, can get complicated. But remember: Just as a facial expression captures a single emotion, an algebraic expression captures a single quantity.

 5

Lesson Structure *and Support*

Every lesson in Grade Level 6–Algebra I/Mathematics I is organized into four sections, providing the teacher with a clear lesson plan for the day's learning.

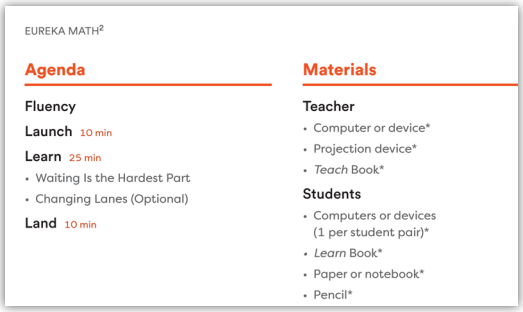
- **Fluency** opens each lesson and provides distributed practice with previously learned material. This practice prepares students for new learning by activating prior knowledge and bridging small learning gaps.
- **Launch** creates an accessible entry point to the day's learning with activities that build context and create productive struggle, which helps build new knowledge.
- **Learn** presents new math concepts related to the lesson objective, usually through a series of instructional segments.
- **Land** provides time for teachers to facilitate a brief closing discussion and for students to complete the Exit Ticket.

Throughout the lesson, margin notes provide information about facilitation, differentiation, and coherence. The curriculum has six types of margin notes: Teacher Notes, Universal Design for Learning, Language Support, Differentiation, Promoting the Standards for Mathematical Practice, and Math Past.

Dive into a *Lesson*

The lesson overview on page 14 helps teachers prepare to teach Mathematics I Module 1 Lesson 1.

- The **Lesson at a Glance** is a snapshot of the lesson framed through what students should know, understand, and do while engaging with the lesson.
- The **Key Question** helps focus instruction and classroom discourse.
- The **Achievement Descriptors** appear again, this time mapping what students should know and be able to do based on the instruction of the specific lesson to the standards covered.
- An image of the **Exit Ticket** from the end of the lesson shows what this formative assessment includes.


EUREKA MATH²

Agenda

Fluency

Launch 10 min

Learn 25 min

- Waiting Is the Hardest Part
- Changing Lanes (Optional)

Land 10 min

Materials

Teacher

- Computer or device*
- Projection device*
- *Teach* Book*

Students

- Computers or devices (1 per student pair)*
- *Learn* Book*
- Paper or notebook*
- Pencil*

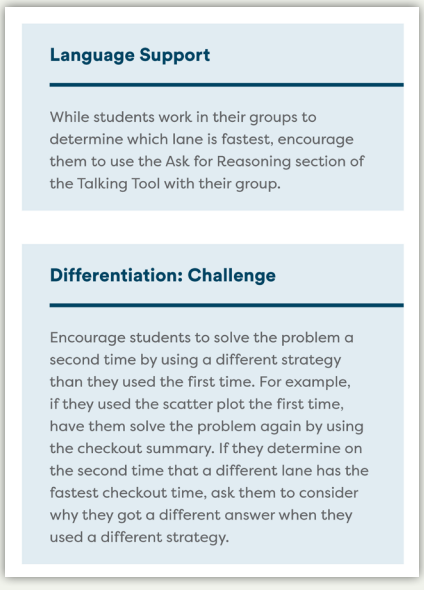
Page 15 lays out the learning agenda, the materials list, and lesson preparation notes. These are all shared up front to help teachers feel organized and ready for the lesson.

During the Lesson 1 Fluency exercise on page 15, students determine rates from different representations to prepare for solving a problem by using a combination of tools.

In Launch, students watch a wordless context video on the Great Minds® Digital Platform to identify what elements might affect how fast checkout lines move at a grocery store. Each video in our *Eureka Math²* digital experience has been crafted with special care to ensure the representation of students from different backgrounds and abilities. These videos do not include spoken words because we want to make them accessible to multilingual learners and striving readers and keep the focus on the math story instead of the dialogue.

In Learn, students work in groups to decide which lane has the fastest time by using given data and a combination of tools used for statistics, geometry, and algebra. After groups share their responses and compare solution paths, students watch the video's conclusion to recognize several ways to apply statistical, geometric, and algebraic thinking to solve various problems.

As students get more confident, they're invited to try different strategies. Before students begin this work, teachers should note that the teacher margin note provided on page 24 offers differentiation ideas for students who need additional challenge or enrichment.


Language Support

While students work in their groups to determine which lane is fastest, encourage them to use the Ask for Reasoning section of the Talking Tool with their group.

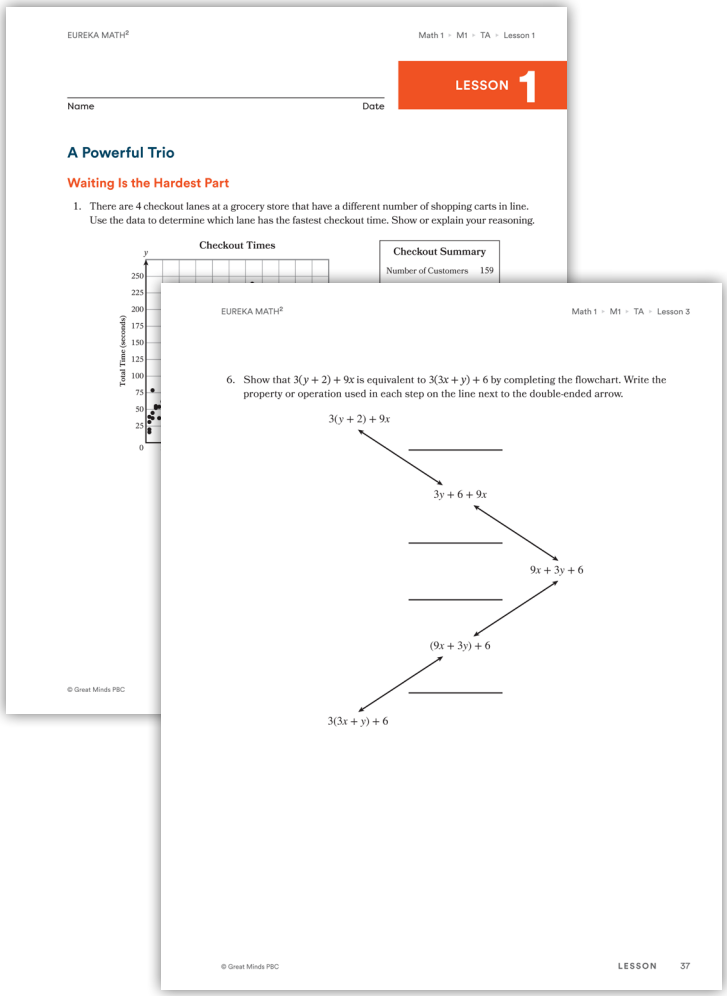
Differentiation: Challenge

Encourage students to solve the problem a second time by using a different strategy than they used the first time. For example, if they used the scatter plot the first time, have them solve the problem again by using the checkout summary. If they determine on the second time that a different lane has the fastest checkout time, ask them to consider why they got a different answer when they used a different strategy.

The Student Experience:
Learn

On page 7 of the *Learn* book, students begin the Launch portion of the lesson. Notice the Lesson 1 heading in the top corner of the page that indicates the beginning of a lesson.

Let's look at readability. You will notice that the student materials are intentionally designed to be readable while maintaining the rigor that you've come to expect from Great Minds curricula. We have reduced wordiness— eliminating unnecessary wording entirely—and we have been intentional in our language choices and sentence length.



EUREKA MATH²

Math 1 › M1 › TA › Lesson 1

LESSON 1

Name Date

A Powerful Trio

Waiting Is the Hardest Part

1. There are 4 checkout lanes at a grocery store that have a different number of shopping carts in line. Use the data to determine which lane has the fastest checkout time. Show or explain your reasoning.

Checkout Times

Checkout Summary

Number of Customers 159

Total Time (seconds)

© Great Minds PBC

EUREKA MATH²

Math 1 › M1 › TA › Lesson 3

6. Show that $3(y + 2) + 9x$ is equivalent to $3(3x + y) + 6$ by completing the flowchart. Write the property or operation used in each step on the line next to the double-ended arrow.

$3(y + 2) + 9x$

$3y + 6 + 9x$

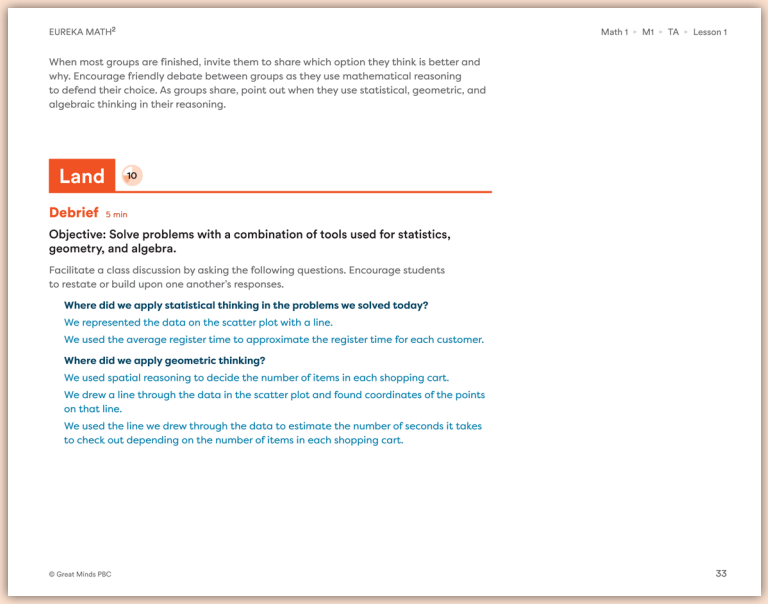
$9x + 3y + 6$

$(9x + 3y) + 6$

$3(3x + y) + 6$

© Great Minds PBC

LESSON 37



EUREKA MATH²

Math 1 › M1 › TA › Lesson 1

When most groups are finished, invite them to share which option they think is better and why. Encourage friendly debate between groups as they use mathematical reasoning to defend their choice. As groups share, point out when they use statistical, geometric, and algebraic thinking in their reasoning.

Land 10

Debrief 5 min

Objective: Solve problems with a combination of tools used for statistics, geometry, and algebra.

Facilitate a class discussion by asking the following questions. Encourage students to restate or build upon one another's responses.

Where did we apply statistical thinking in the problems we solved today?

We represented the data on the scatter plot with a line.

We used the average register time to approximate the register time for each customer.

Where did we apply geometric thinking?

We used spatial reasoning to decide the number of items in each shopping cart.

We drew a line through the data in the scatter plot and found coordinates of the points on that line.

We used the line we drew through the data to estimate the number of seconds it takes to check out depending on the number of items in each shopping cart.

© Great Minds PBC

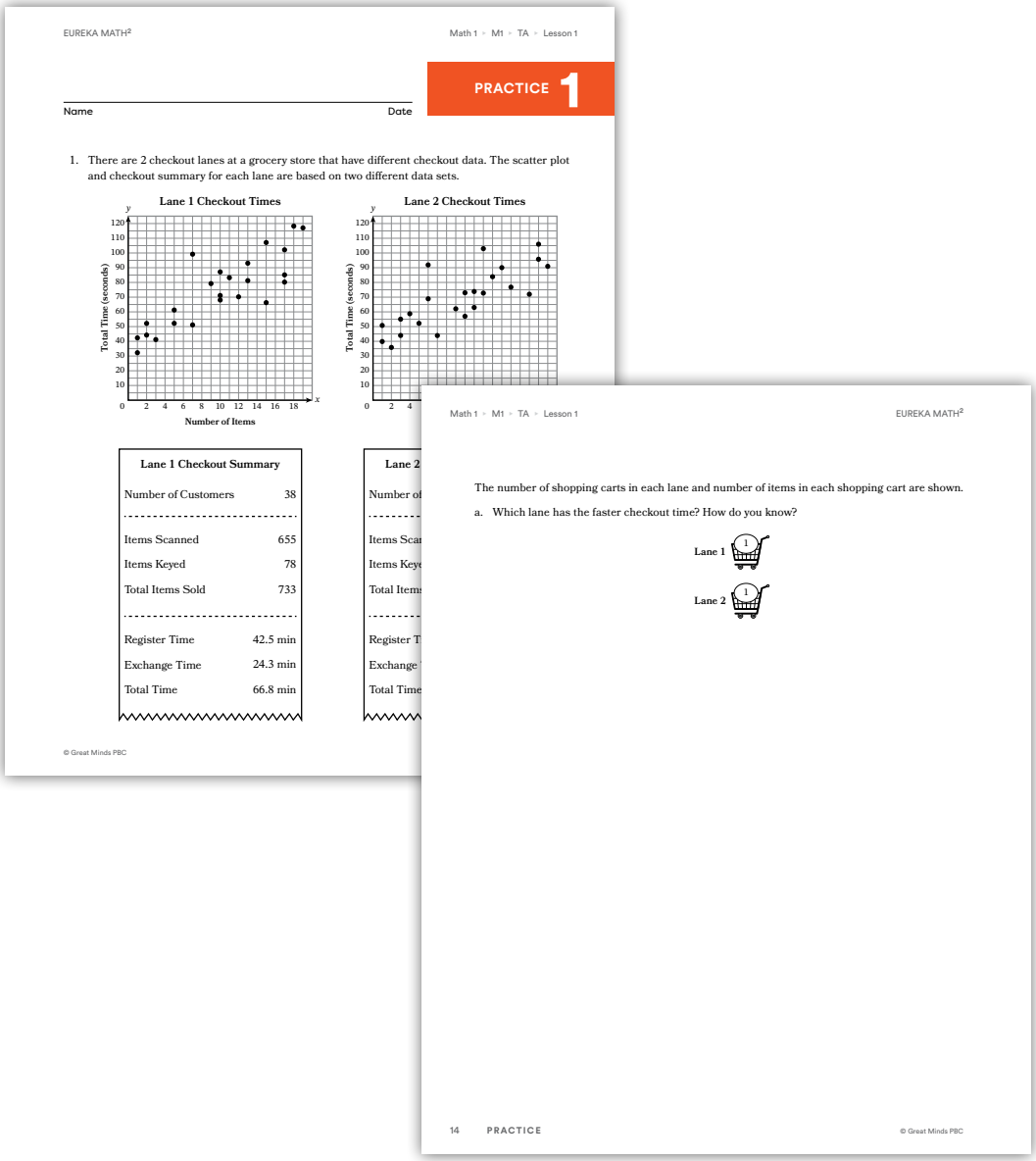
33

After students apply statistical, geometric, and algebraic thinking to solve problems, the class comes back together for the Land portion of the lesson. For Lesson 1, this section begins on page 33 of the *Teach* book. In this portion of the lesson, the teacher facilitates a discussion by using suggested questions related to the lesson's objectives and guides students to synthesize the day's learning. Following the discussion, students complete the Exit Ticket on page 11 of their *Learn* book. This gives teachers a sense of what students understand so they can help make instructional decisions for the next lesson.

Continued Practice *at Home*

Included at the end of each lesson in the *Learn* book is a lesson Recap and more Practice problems with the concepts learned in class.

- **Recaps** summarize the main learning in the lesson. Definitions of any terms introduced in the lesson are included. Each Recap also shows problems like those completed in class and examples of the thinking that helps students solve the problems. Recaps are useful for anyone supporting the student's learning outside of the classroom.
- **Practice** problems provide an additional set of problems organized from simple to complex. These problems interleave and distribute practice, providing students with opportunities to discern and recall which knowledge, concepts, and strategies are appropriate for solving different problems. Practice problems can be completed in the classroom or assigned outside of the classroom.



EUREKA MATH²

Math 1 • M1 • TA • Lesson 1

PRACTICE 1

Name Date

1. There are 2 checkout lanes at a grocery store that have different checkout data. The scatter plot and checkout summary for each lane are based on two different data sets.

Lane 1 Checkout Times

Lane 2 Checkout Times

Lane 1 Checkout Summary	
Number of Customers	38
Items Scanned	655
Items Keyed	78
Total Items Sold	733
Register Time	42.5 min
Exchange Time	24.3 min
Total Time	66.8 min

Math 1 • M1 • TA • Lesson 1 EUREKA MATH²

The number of shopping carts in each lane and number of items in each shopping cart are shown.

a. Which lane has the faster checkout time? How do you know?

Lane 1

Lane 2

Assessment with *Eureka Math²*

The assessment system for Grade Level 6–Algebra I/Mathematics I helps teachers understand student learning by generating data from many perspectives. The system includes three components.

- **Exit Tickets** are formative assessment opportunities that use at least one problem or question to assess whether a student has learned the basic skills and concepts needed for success in upcoming lessons. Items reflect the minimum that students must demonstrate to meet the lesson objective.

  Students complete Exit Tickets independently on paper, with directions or problems read aloud as necessary, and they are not graded. Most students with a basic understanding of the math can finish within 3–5 minutes. Generally, teachers should strictly observe this time frame because a student's inability to finish within 5 minutes can be valuable proficiency information.

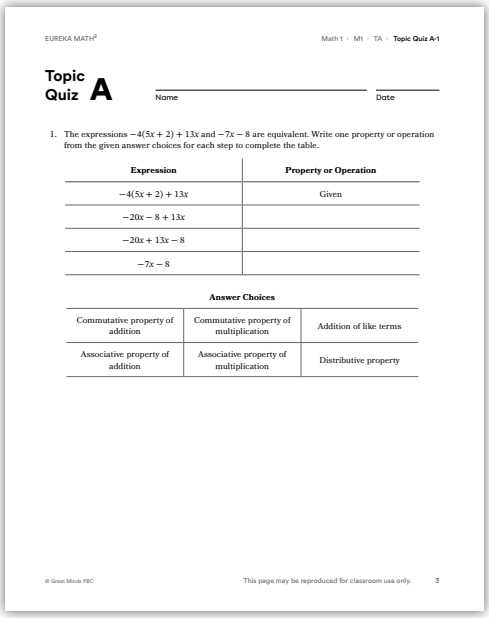
- **Topic Quizzes** are short sets of items that assess proficiency with the major concepts and skills from the topic. These include Depth of Knowledge (DOK) 1 and 2 items. Topic Quizzes are intended for digital administration, with a paper-based option.

  There are three analogous versions of each Topic Quiz available digitally. Analogous versions target the same material at the same level of cognitive complexity. Use the analogous versions as additional practice or retakes after targeted reteaching.

- **Module Assessments** consist of 6–10 items that assess proficiency in the major concepts, skills, and applications taught in the module. Module Assessments represent the most important content, but they may not assess all the strategies and standards taught in the module.

In addition to the assessments above, *Eureka Math² Equip*™ diagnostic and various benchmark summative assessments are available for print and digital administration.

Click to review the *Eureka Math²* assessments on the Great Minds Digital Platform.



EUREKA MATH² Math 1 • M1 • TA • Topic Quiz A-1

Topic Quiz A Name _____ Date _____

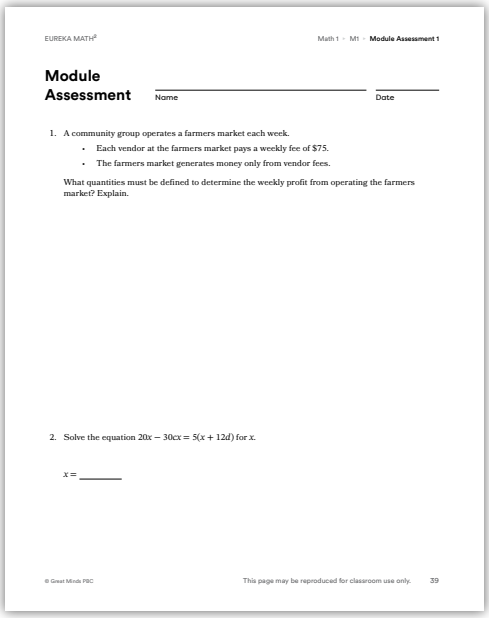
1. The expressions $-4(5x + 2) + 13x$ and $-7x - 8$ are equivalent. Write one property or operation from the given answer choices for each step to complete the table.

Expression	Property or Operation
$-4(5x + 2) + 13x$	Given
$-20x - 8 + 13x$	
$-20x + 13x - 8$	
$-7x - 8$	

Answer Choices

Commutative property of addition	Commutative property of multiplication	Addition of like terms
Associative property of addition	Associative property of multiplication	Distributive property

© Great Minds PBC This page may be reproduced for classroom use only. 3



EUREKA MATH² Math 1 • M1 • Module Assessment 1

Module Assessment Name _____ Date _____

1. A community group operates a farmers market each week.
   - Each vendor at the farmers market pays a weekly fee of $75.
   - The farmers market generates money only from vendor fees.

   What quantities must be defined to determine the weekly profit from operating the farmers market? Explain.

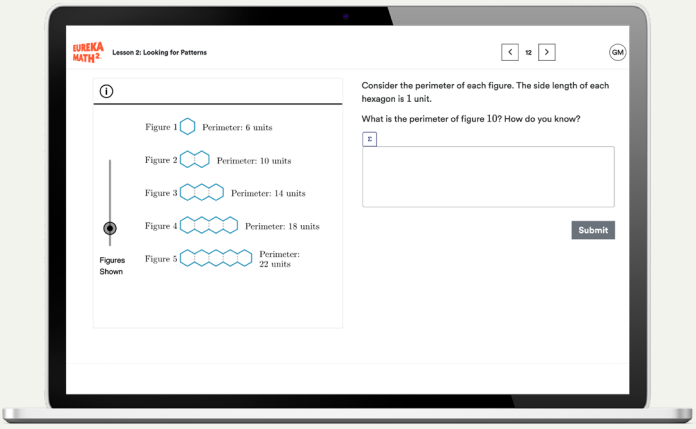
2. Solve the equation $20x - 30cx = 5(x + 12d)$ for x.

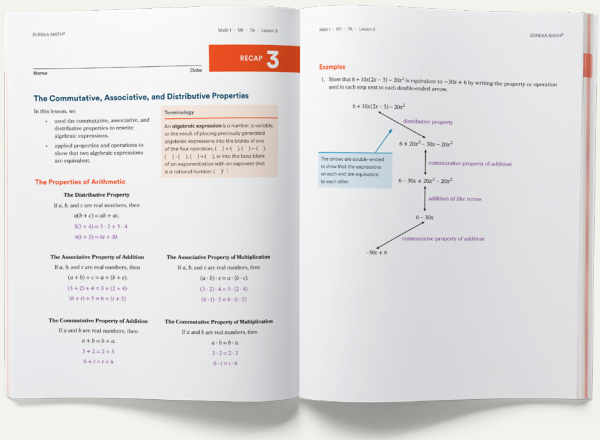
   $x =$ _____

© Great Minds PBC This page may be reproduced for classroom use only. 39

Raising the Bar to the *Second Power*

In the world of math curricula, *Eureka Math²* stands alone. Our curriculum invites student discourse, provides accessibility, and advances equity. Its combination of digital and print resources helps all students build a strong foundation of mathematical knowledge that they will build upon, module after module and year after year.





Access the Great Minds Digital Platform to review *Eureka Math²* assessments, digital interactives, context videos, and more.