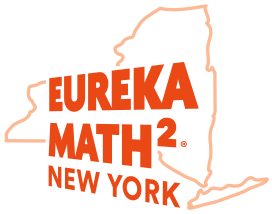


A Story of Units®

3–5

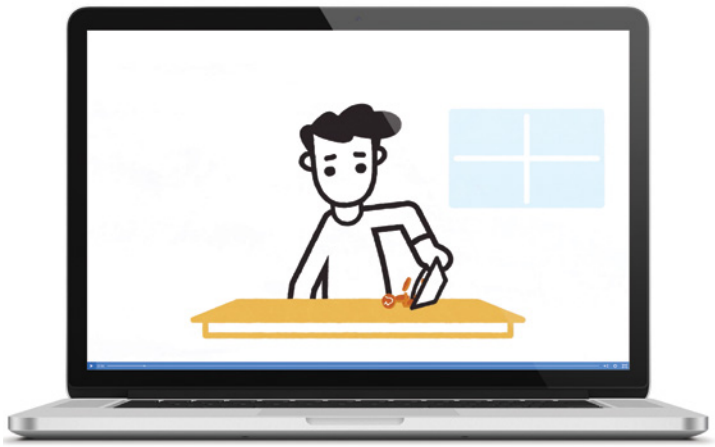
IMPLEMENTATION GUIDE

Contents

What's Included

Teach book

Great Minds® Digital Platform



Learn book

Apply book

Eureka Math²® New York Next Gen is a comprehensive math program built on the foundational idea that math is best understood as an unfolding story where students learn by connecting new learning to prior knowledge. Consistent math models, content that engages students in productive struggle, and coherence across lessons, modules, and grades provide entry points for all learners to access grade-level mathematics.

***Eureka Math²* *New York Next Gen* is designed with access and engagement in mind.** Peer discussion helps students solidify their understanding of math concepts, so every lesson includes opportunities for rich student discourse. The *Eureka Math²* *New York Next Gen* digital experience further supports discourse, giving all students opportunities to access learning and share their mathematical thinking while also providing teachers with windows into students' thinking. *Eureka Math²* *New York Next Gen* encourages students to think like mathematicians as they tackle tough problems and answer their own questions. In *Eureka Math²* *New York Next Gen* classrooms, students regularly share their mathematical knowledge through discussion and reasoning.

In addition, lessons follow Universal Design for Learning principles to accommodate various learning differences and increase access for multilingual learners and emergent readers. We've also increased our focus on student ownership of learning and belonging in the mathematics classroom. These elements are woven into our instructional design and instructional routines, and lesson-specific strategies help teachers address learner variance.

***Eureka Math²* *New York Next Gen* was also designed with teachability in mind.** Every classroom is unique, and we've designed the curriculum with that understanding. For example, we've intentionally built flexibility into the year-long pacing and created options for you to choose from within modules and lessons. This way you can spend your time where it's needed most—delivering instruction that meets the needs of your specific students.

So what should you expect from this guide? Think of it as a user's manual for the curriculum. This guide orients you to the structure and design of *Eureka Math*^{2} *New York Next Gen*, and to what is available in the digital experience and in print. You'll find answers to questions both big and small:

- How does *Eureka Math*^{2} *New York Next Gen* enrich my content and pedagogical knowledge?
- What is the lesson structure?
- What is included in my *Teach* book? What about the digital platform?
- How do students engage with the digital platform?
- What is included in the *Learn* and *Apply* books?
- What assessments are available?

We are so excited to launch this curriculum together with you. We hope this Implementation Guide is an empowering resource as you begin to teach *Eureka Math*^{2} *New York Next Gen.* At Great Minds® we believe that every child is capable of greatness. We are confident that, as your students notice and wonder, as you foster their interest in the mathematics, and as their minds are opened to new connections, greatness will be brought to life in your classroom each day.

Inside *Teach*

Each of your six *Teach* books includes one module. Within a module, small groups of related lessons are organized into topics.

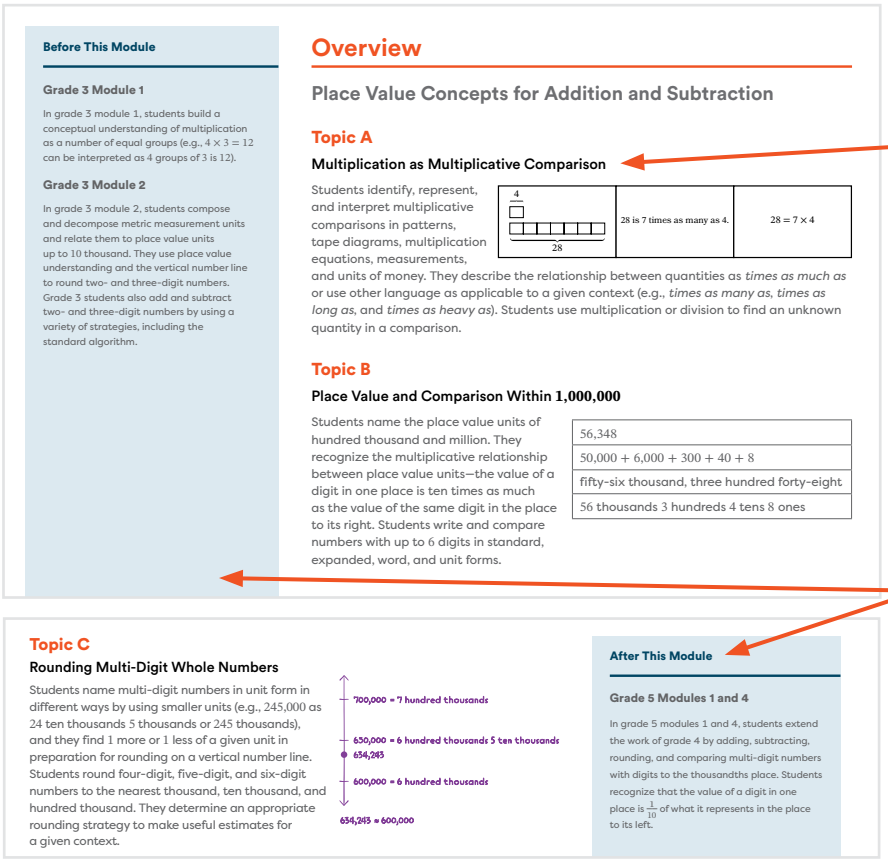
Module-Level Components

Cover Art

Each *Teach* book opens with a stunning work of fine art that has a connection to the math learned within the module. The cover art is discussed or analyzed in specific lessons within the module.

Overview

Your *Teach* book begins with the Overview, a topic-by-topic summary that shows the development of learning throughout the module. It also provides connections to work done before and after the module, helping you understand the module's place in the overall development of learning in and across the grade levels.



Before This Module

Grade 3 Module 1

In grade 3 module 1, students build a conceptual understanding of multiplication as a number of equal groups (e.g., $4 \times 3 = 12$ can be interpreted as 4 groups of 3 is 12).

Grade 3 Module 2

In grade 3 module 2, students compose and decompose metric measurement units and relate them to place value units up to 10 thousand. They use place value understanding and the vertical number line to round two- and three-digit numbers. Grade 3 students also add and subtract two- and three-digit numbers by using a variety of strategies, including the standard algorithm.

Overview

Place Value Concepts for Addition and Subtraction

Topic A

Multiplication as Multiplicative Comparison

Students identify, represent, and interpret multiplicative comparisons in patterns, tape diagrams, multiplication equations, measurements, and units of money. They describe the relationship between quantities as *times as much as* or use other language as applicable to a given context (e.g., *times as many as*, *times as long as*, and *times as heavy as*). Students use multiplication or division to find an unknown quantity in a comparison.

Topic B

Place Value and Comparison Within 1,000,000

Students name the place value units of hundred thousand and million. They recognize the multiplicative relationship between place value units—the value of a digit in one place is ten times as much as the value of the same digit in the place to its right. Students write and compare numbers with up to 6 digits in standard, expanded, word, and unit forms.

56,348
50,000 + 6,000 + 300 + 40 + 8
fifty-six thousand, three hundred forty-eight
56 thousands 3 hundreds 4 tens 8 ones

Topic C

Rounding Multi-Digit Whole Numbers

Students name multi-digit numbers in unit form in different ways by using smaller units (e.g., 245,000 as 24 ten thousands 5 thousands or 245 thousands), and they find 1 more or 1 less of a given unit in preparation for rounding on a vertical number line. Students round four-digit, five-digit, and six-digit numbers to the nearest thousand, ten thousand, and hundred thousand. They determine an appropriate rounding strategy to make useful estimates for a given context.

After This Module

Grade 5 Modules 1 and 4

In grade 5 modules 1 and 4, students extend the work of grade 4 by adding, subtracting, rounding, and comparing multi-digit numbers with digits to the thousandths place. Students recognize that the value of a digit in one place is $\frac{1}{10}$ of what it represents in the place to its left.

The **Overview** describes, topic by topic, the story of learning in the module.

Before This Module and **After This Module** look back and forward to reveal coherence across modules and grade levels.

Contents

Lesson objectives reveal the story of each topic at a glance.

Contents

Place Value Concepts for Addition and Subtraction

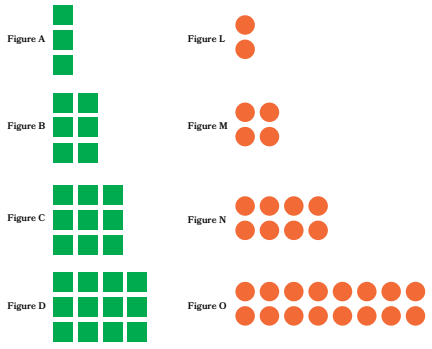
The Why section gives insight into the decisions made during the writing of the module. This insight helps you understand the underlying structure of the module, flow of the content, and coherence of the different parts of the curriculum.

Why

Place Value Concepts for Addition and Subtraction

Why does the place value module begin with a topic on multiplicative comparisons?

Beginning with multiplicative comparison enables students to build on their prior knowledge of multiplication from grade 3 and provides a foundation upon which students can explore the relationships between numbers and place value units. This placement also activates grade 3 knowledge of multiplication and division facts within 100 and provides students with opportunities to continue building fluency with the facts in preparation for multiplication and division in modules 2 and 3.



Students are familiar with additive comparison—relating numbers in terms of *how many more* or *how many less*. Multiplicative comparison—relating numbers as *times as many*—is a new way to compare numbers. Students use multiplicative comparison throughout the year to relate measurement units, whole numbers, and fractions. This important relationship between factors, where one factor tells how much larger the product is compared to the other factor, is foundational to ratios and proportional relationships in later grades. Taking time to develop this understanding across the grade 4 modules sets students up for success with interpreting multiplication as scaling in grade 5 and applying or finding a scale factor in scale drawings, dilations, and similar figures.

Achievement Descriptors: Overview

The Achievement Descriptors: Overview section is a helpful guide that describes what Achievement Descriptors (ADs) are and briefly explains how to use them. It identifies specific ADs for the module, with more guidance provided in the Achievement Descriptors: Proficiency Indicators resource at the end of each *Teach* book.

Topic-Level Components

Topic Overview

Each topic begins with a Topic Overview that is a summary of the development of learning in that topic. It typically includes information about how learning connects to previous or upcoming content.

Progression of Lessons

The Progression of Lessons is a list of lessons in the topic that shows sample content from each lesson along with a student-friendly statement of the major learning.

Progression of Lessons

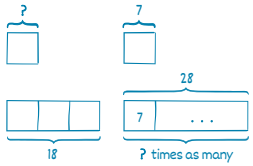
Lesson 1

Interpret multiplication as multiplicative comparison.

I notice that some shape and number patterns have rules that use addition and some have rules that use multiplication. I can describe the multiplication patterns by using times as many. *For example, I can read a multiplication equation such as* $16 = 2 \times 8$ *as* 16 *is* 2 *times as many as* 8.

Lesson 2

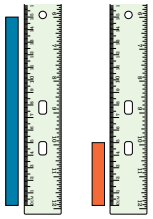
Solve multiplicative comparison problems with unknowns in various positions.



I can use the relationship between multiplication and division to help me solve a multiplicative comparison problem where the factor or product is unknown. I can draw a tape diagram to identify the known and unknown information and then use multiplication or division to find the unknown.

Lesson 3

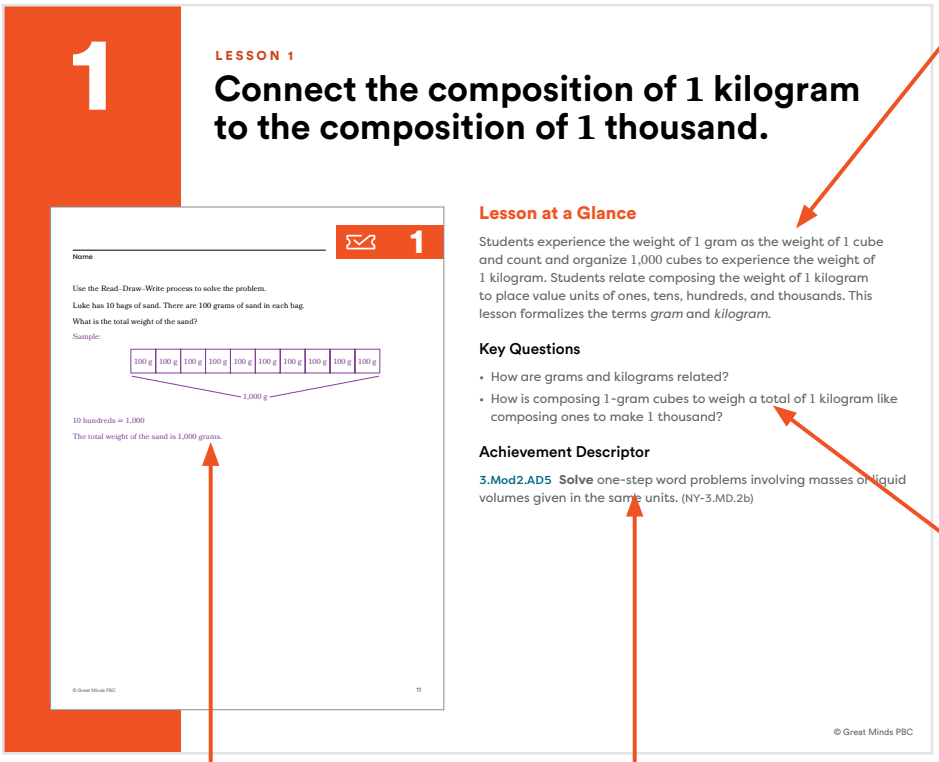
Describe relationships between measurements by using multiplicative comparison.



I can use language such as times as long as *and* times as heavy as *to describe how measurements are related. Tape diagrams and pictures of objects with measurement tools such as scales, rulers, and beakers can show the relationships between different measurements. I can describe the relationships by using words and equations.*

Lesson Overview

Each lesson begins with two pages of information to help you prepare to teach the lesson.



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. It includes information about the tools, representations, and terminology used in the lesson.

Key Questions help focus your instruction and classroom discourse. They encapsulate the key learning of the lesson and may help develop coherence and connections to other concepts or a deeper understanding of a strategy or model. Students discuss these questions as part of the Debrief to synthesize learning during the Land section of the lesson.

The **Exit Ticket** is a formative assessment that is given at the end of the lesson. Use it to monitor student progress toward proficiency on the Achievement Descriptors and to make instructional choices for upcoming lessons.

Achievement Descriptors (ADs) are standards-aligned descriptions that detail what students should know and be able to do based on instruction. The number of ADs addressed in each lesson varies depending on the content. Turn to the Resources section at the end of the *Teach* book to see the proficiency indicators for each AD. Proficiency indicators help you assess your students' level of proficiency.

Agenda

Fluency 10 min

Launch 5 min

Learn 35 min

- Compose 1,000 Grams Concretely
- Pictorial Representation
- Problem Set

Land 10 min

Materials

Teacher

- Classroom objects (6)
- Interlocking cubes, 1 cm (1,264)
- Digital compact scale
- Chart paper
- Resealable bags, sandwich-size (12)
- Resealable bag, gallon-size
- Computer or device*
- Projection device*
- *Teach* book*

Students

- Dry-erase marker*
- *Learn* book*
- Pencil*
- Personal whiteboard*
- Personal whiteboard eraser*

**These materials are only listed in lesson 1. Ready these materials for every lesson in this module.*

Lesson Preparation

- Gather six classroom objects of various weights such as a paper clip, dry-erase marker, stapler, dictionary, pair of scissors, and coffee mug.
- Draw a 4-column place value chart without column headings on a piece of chart paper.
- Consider saving the bags of cubes made in this lesson for use in lesson 2.

The **Agenda** shows the sequence and recommended time length of the sections of the lesson.

Materials lists the items that you and your students need for the lesson. If not otherwise indicated, each student needs one of each listed material.

Lesson Preparation provides guidance about materials that need to be created, assembled, or placed in advance.

Lesson Structure

Each lesson is structured in four sections: Fluency, Launch, Learn, and Land. Lessons are designed for one instructional period, with total length determined by the grade level as listed here.

- Kindergarten: 50 minutes
- Grades 1–5: 60 minutes
- Grades 6–12: 45 minutes

Fluency

Fluency provides distributed practice with previously learned material. It is designed to prepare students for new learning by activating prior knowledge and bridging small learning gaps.

Launch

Launch creates an accessible entry point to the day's learning through activities that build context and often create productive struggle that leads to a need for the learning that follows. Every Launch ends with a transition statement that sets the goal for the day's learning.

Learn

Learn presents new learning related to the lesson objective, usually through a series of instructional segments. This lesson component takes most of the instructional time. Suggested facilitation styles vary and may include direct instruction, guided instruction, group work, partner activities, interactive video, and digital elements. The Problem Set, an opportunity for independent practice, is included in Learn.

Land

Land helps you facilitate a brief discussion to close the lesson and provides students with an opportunity to complete the Exit Ticket. In the Debrief portion of Land, suggested questions, including key questions related to the objective, help students synthesize the day's learning. The Exit Ticket provides a window into what students understand so that you can make instructional decisions.

Margin Notes

There are six types of instructional guidance that appear in the margins. These notes provide information about facilitation, differentiation, and coherence.

Teacher Notes communicate information that helps with implementing the lesson. Teacher Notes may enhance mathematical understanding, explain pedagogical choices, give background information, or help you identify common misconceptions.

Universal Design for Learning (UDL) suggestions offer strategies and scaffolds that address learner variance. These suggestions promote flexibility with engagement, representation, and action and expression, the three UDL principles described by CAST. These strategies and scaffolds are additional suggestions to complement the curriculum's overall alignment with the UDL Guidelines.

Language Support provides ideas to support students with receiving (reading and listening) and producing (speaking and writing) English in mathematical contexts. Suggestions may include ways to promote student-to-student discourse, support new and familiar content-specific terminology or academic language, or support students with multiple-meaning words.

Differentiation suggestions provide targeted ways to help meet the needs of specific learners based on your observations or other assessments. There are two types of suggestions: support and challenge. Use these to support students in the moment or to advance learning for students who are ready for more of a challenge.

Promoting the Standards for Mathematical Practice highlights places in the lesson where students are engaging in or building experience with the Standards for Mathematical Practice (MPs). Although most lessons offer opportunities for students to engage with more than one Standard for Mathematical Practice, this guidance identifies a focus MP within each lesson. The notes also provide lesson-specific information, ideas, and questions that you can use to deepen students' engagement with the focus MP. Often, the suggested questions for a particular MP repeat. This intentional repetition supports students in understanding the MPs in different contexts.

Math Past provides guidance about how to use the module's Math Past resource in the lesson. (See Resources in this document.)

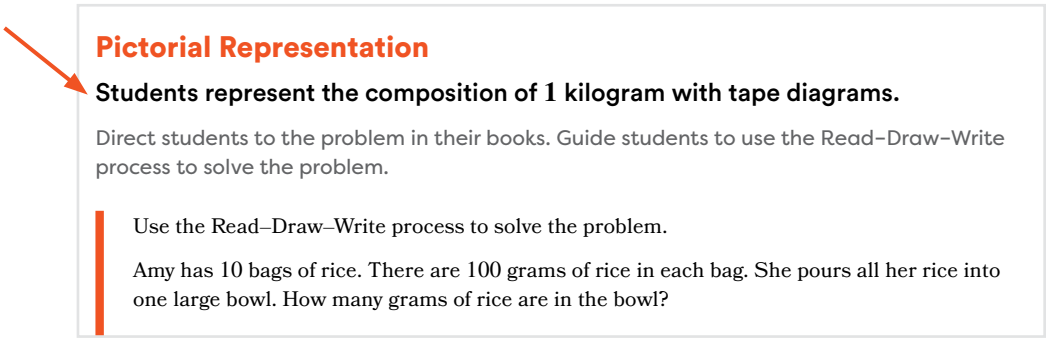
Lesson-Level Sample Solutions

Sample Solutions are examples of solutions to problems students will engage with during the lesson, including those in the Problem Set. Although specific solution paths are provided in the sample solutions, they are only samples. Accept accurate responses, reasonable explanations, and equivalent answers for student work even if they differ from the sample.

Visual Design

In the *Teach* book, color coding and other types of text formatting are used to highlight facilitation recommendations and possible statements, questions, and student responses. These are always suggestions and not a script.

- Each section includes a bold line of text that gives the purpose for that section. These purpose statements, taken together, support the overall objective of the lesson.



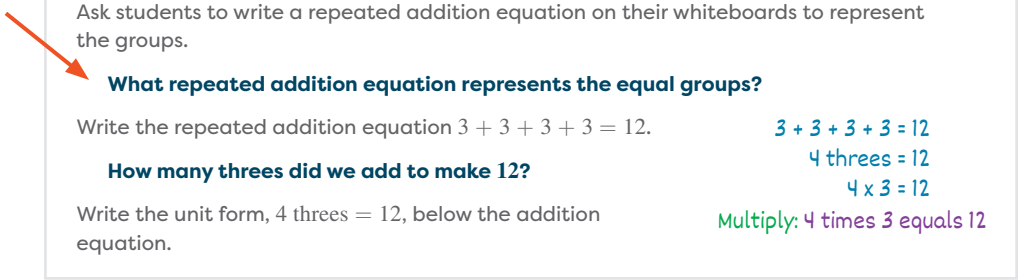
Pictorial Representation

Students represent the composition of 1 kilogram with tape diagrams.

Direct students to the problem in their books. Guide students to use the Read–Draw–Write process to solve the problem.

> Use the Read–Draw–Write process to solve the problem.
>
> Amy has 10 bags of rice. There are 100 grams of rice in each bag. She pours all her rice into one large bowl. How many grams of rice are in the bowl?

- Dark blue text shows suggested language for questions and statements that are essential to the lesson.



Ask students to write a repeated addition equation on their whiteboards to represent the groups.

What repeated addition equation represents the equal groups?

Write the repeated addition equation $3 + 3 + 3 + 3 = 12$.

$3 + 3 + 3 + 3 = 12$
4 threes = 12
4 x 3 = 12
Multiply: 4 times 3 equals 12

How many threes did we add to make 12?

Write the unit form, $4 \text{ threes} = 12$, below the addition equation.

- Light blue text shows sample student responses.

Model putting together the 4 five-sticks to form a 4 by 5 array and ask students if it still shows 4 fives. Ask them what changed.

4 x 5 = 20
The product is 20.

Does $4 \times 5 = 20$ still represent the array? Why?

Yes, because the array did not change. We just put the five-sticks together to remove the spaces between the rows.

Invite students to turn and talk about how equal groups are represented in an array.

- Text that resembles handwriting indicates what you might write on the board. Different colors signal that you will add to the recording at different times during the discussion.

Ask students to write a repeated addition equation on their whiteboards to represent the groups.

What repeated addition equation represents the equal groups?

Write the repeated addition equation $3 + 3 + 3 + 3 = 12$.

3 + 3 + 3 + 3 = 12
4 threes = 12
4 x 3 = 12
Multiply: 4 times 3 equals 12

How many threes did we add to make 12?

Write the unit form, 4 threes $= 12$, below the addition equation.

- Bulleted lists provide suggested advancing and assessing questions to guide learning as needed.

So if there are about 200 birds in the first picture, about 100 birds in the second picture, and about 300 birds in the third picture, about how many birds are in all three pictures?

About 600 birds

Rounding and then adding is another way to estimate.

Facilitate a brief discussion to draw out the distinction between these two types of estimating. Consider asking questions such as the following:

- When we estimated the number of birds in the picture, what information did we start with?
- When we estimated the total number of birds in all three pictures, what information did we start with?
- What strategy did we use to estimate when we were given the number of birds in each picture?
- How did we use benchmark numbers for the different ways we estimated?

Consider summarizing the two ways to estimate with the following statement.

We estimated in two different ways. First, we estimated visually because we weren't given any numbers to start with. In the next problem, we estimated by using rounding because we knew exactly how many birds were in each picture.

- Text in purple shows possible student responses. These responses only appear in *Teach*.

Direct students to problem 1 in their books. Ask students to draw an array to show 3 rows of 5, using circles to represent the cubes.

1. Draw an array to show 3 rows of 5.

$3 \times 5 = 15$

Resources

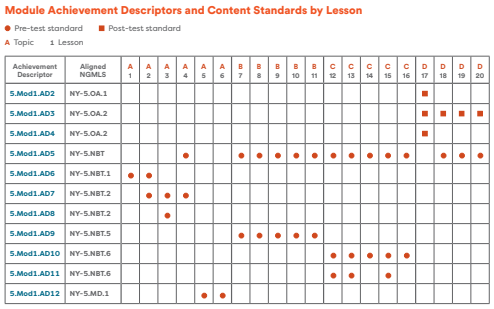
Near the end of your *Teach* book, you will find resources for assessment, lesson planning, and further study.

Standards

Standards lists the content standards that are addressed in the module. This resource also lists the Standards for Mathematical Practice.

Module Achievement Descriptors and Content Standards by Lesson

These charts highlight the location and frequency of the Achievement Descriptors (ADs) and standards for each lesson in a module. Each standard is also identified as a pre-test or post-test standard. Guidance is included to give insight about why an identified post-test standard is taught pre-test.



Achievement Descriptors: Proficiency Indicators

Achievement Descriptors (ADs) are standards-aligned descriptions that detail what students should know and be able to do based on instruction they receive. The number of ADs addressed in each lesson varies depending on the content.

This resource includes proficiency indicators for each AD. Proficiency indicators are descriptions of work that is partially proficient, proficient, or highly proficient. Proficiency indicators help you assess your students' level of proficiency.

Supplemental Instructional Guidance

This document contains guidance for instructional decisions specific to New York State, including whether to omit, replace, or add activities based on the New York State Next Generation Mathematics Learning Standards (NGMLS). All suggested resources are located within the Resources section of each indicated lesson in the digital platform.

Terminology

Terminology is a list of new and familiar terms used in the module. New terminology includes definitions as they appear within the module.

New

capacity
Capacity is the maximum amount a container can hold. It is measured using units of liquid volume such as liters and milliliters. (Lesson 4)

Capacity is about the container. Liquid volume is about the liquid, regardless of what container it is in.

New terminology is described in student-friendly language, and the lesson in which the terms are introduced is listed.

standard algorithm (for addition and subtraction)
The standard algorithm is the process of adding (or subtracting) like units in a systematic way. Like units are added (or subtracted) one place value at a time. Units are regrouped during (or before) the process, as necessary. (Lesson 23)

ten thousand
Ten thousand is a unit composed of 10 thousands. It also names a place in the place value system. (Lesson 8)

≈
A symbol used when two expressions are about equal to each other. For example, 286 is about 290, so we can write 286 ≈ 290. (Lesson 13)

Familiar

about
addend
bar graph
benchmark
centimeters
comparative language: more than, less than, about the same
compose
decompose
divide
estimate (noun)
estimate (verb)
exchange, bundle, unbundle, rename
halfway
heavier, lighter
horizontal
interval
measure
mental math
meters
multiply
number line
place value units
plot
simplifying strategy
temperature
tick mark
vertical
weight

Academic Verbs

determine
examine
locate

A small number of strategically selected **academic verbs** are introduced in each grade level. These verbs first appear in this module.

Familiar terms were introduced or used in earlier grades or modules.

Math Past

Math Past tells the history of some big ideas that shape the mathematics in the module. It 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 information to inform your teaching and lesson-specific ideas about how to engage students in the history of mathematics.

Math Past

Egyptian Multiplication

How did ancient Egyptians multiply numbers?
Was it different from the way students learn to multiply today?
Is the Egyptian method still used?

How would your students calculate 5×20? There are lots of ways to approach it.

Some students might write 20 five times and then add.

$$20 + 20 + 20 + 20 + 20$$

Some might notice that the problem is the same as 20×5 because multiplication is commutative. They might write 5 twenty times and then add.

$$5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5$$

Others might see 20 as $10 + 10$. They might use the break apart and distribute strategy.

$$5 \times (10 + 10) = (5 \times 10) + (5 \times 10)$$

These students probably know how much $50 + 50$ is, so they know the answer to 5×20 is the same.

Maybe some students will see 20 as 2×10. They might think of the associative property and write this:

$$5 \times (2 \times 10) = (5 \times 2) \times 10$$

These students probably know how much 10×10 is, so they know the answer to 5×20 is the same.

Did everyone get 100?

This same problem, 5×20, appeared on an ancient Egyptian papyrus nearly 4,000 years ago.

How was 5×20 found back then? Was the Egyptian method similar to how we multiply in *Eureka Math²™*? Or was it very different?

The Egyptians figured out that they could multiply numbers by doubling and adding. Doubling just means to add a number to itself. The Egyptian method reduced multiplication to the most basic operations.

Materials

The Materials resource lists items that you and your students need for the module.

Works Cited

A robust knowledge base underpins the structure and content framework of *Eureka Math² New York Next Gen*. A listing of the key research appears in the Works Cited for each module.

Inside *Learn*

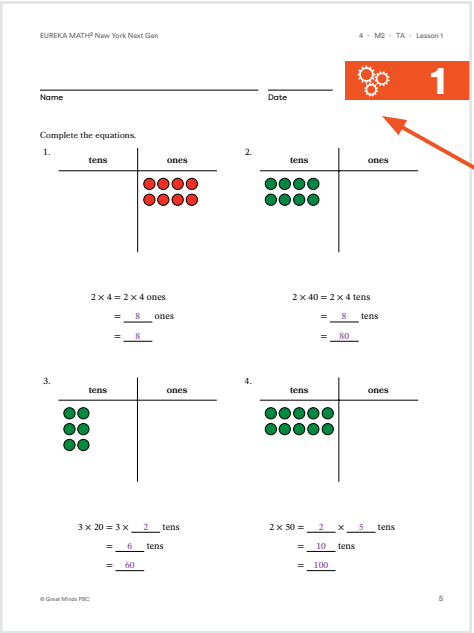
Learn is students' companion text to the instruction in *Teach*. It contains all the pages your students need as you implement each lesson.

Cover Art

Each *Learn* book includes the same work of fine art included on the cover of the *Teach* book. The art has a connection to the math learned within the grade.

Components

The components that go with each lesson are indicated by icons in the student book.


EUREKA MATH² New York Next Gen

4 › M2 › TA › Lesson 1

Name

Date

1

Complete the equations.

1.

tens	ones

2 × 4 = 2 × 4 ones

= 8 ones

= 8

2.

tens	ones

2 × 40 = 2 × 4 tens

= 8 tens

= 80

3.

tens	ones

3 × 20 = 3 × 2 tens

= 6 tens

= 60

4.

tens	ones

2 × 50 = 2 × 5 tens

= 10 tens

= 100

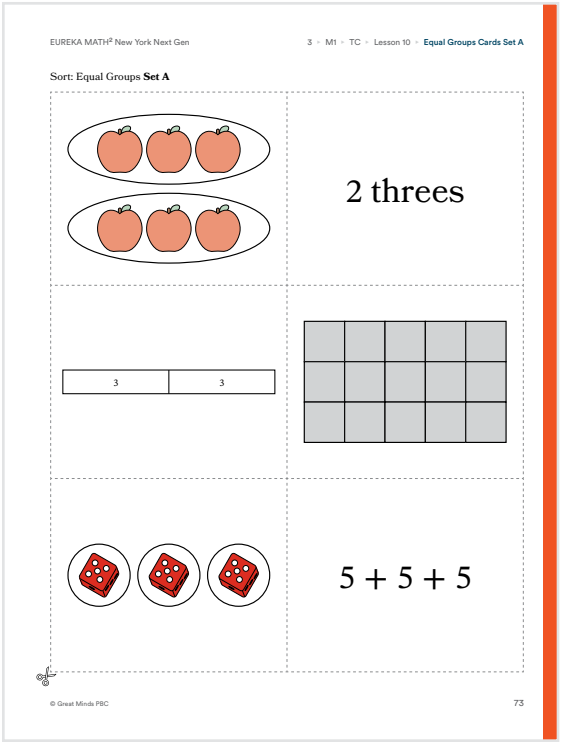
© Great Minds PBC

5

The magnifying glass icon indicates a **lesson page** that students use during the guided or directed portion of the lesson.

The gears icon indicates the **Problem Set**. This is a carefully crafted set of problems or activities meant for independent practice during the lesson. They are organized from simple to complex. Items from the Problem Set may be debriefed in Land, or you may use the items as formative assessment or for deeper discussion about a specific aspect of the instruction.

The checked ticket icon indicates the **Exit Ticket**. The Exit Ticket is a brief, formative assessment of key learning in the lesson.


EUREKA MATH² New York Next Gen 3 ▸ M1 ▸ TC ▸ Lesson 10 ▸ Equal Groups Cards Set A

Sort: Equal Groups **Set A**

2 threes

3 3

5 + 5 + 5

© Great Minds PBC 73

An **orange bar** on the side of a page indicates a removable, a student page that should be removed from the *Learn* book. A removable may be used inside a personal whiteboard so students can practice skills several times in different ways, or it may be cut, assembled, or rearranged for an activity during a lesson or across multiple lessons.

Student Resources

Two other resources are available in the *Learn* book.

Talking Tool

The Talking Tool is a scaffold to support students in producing language to engage in discourse about mathematics with other students. It provides a set of general sentence frames and sentence starters that can be applied to a wide variety of situations.

Language Support margin boxes within the lessons may refer to specific sections of the Talking Tool. Model the use of the sentence frames and sentence starters. This can be done at any time in any lesson but is specifically useful during times of extended student-to-student discourse, such as cooperative activities.


Talking Tool

Share Your Thinking	I know . . . . I did it this way because . . . . The answer is ____ because . . . . My drawing shows . . . .
Agree or Disagree	I agree because . . . . That is true because . . . . I disagree because . . . . That is not true because . . . . Do you agree or disagree with ____? Why?
Ask for Reasoning	Why did you . . . ? Can you explain . . . ? What can we do first? How is ____ related to ____?
Say It Again	I heard you say . . . . ____ said . . . . Another way to say that is . . . . What does that mean?

Thinking Tool

The Thinking Tool 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.

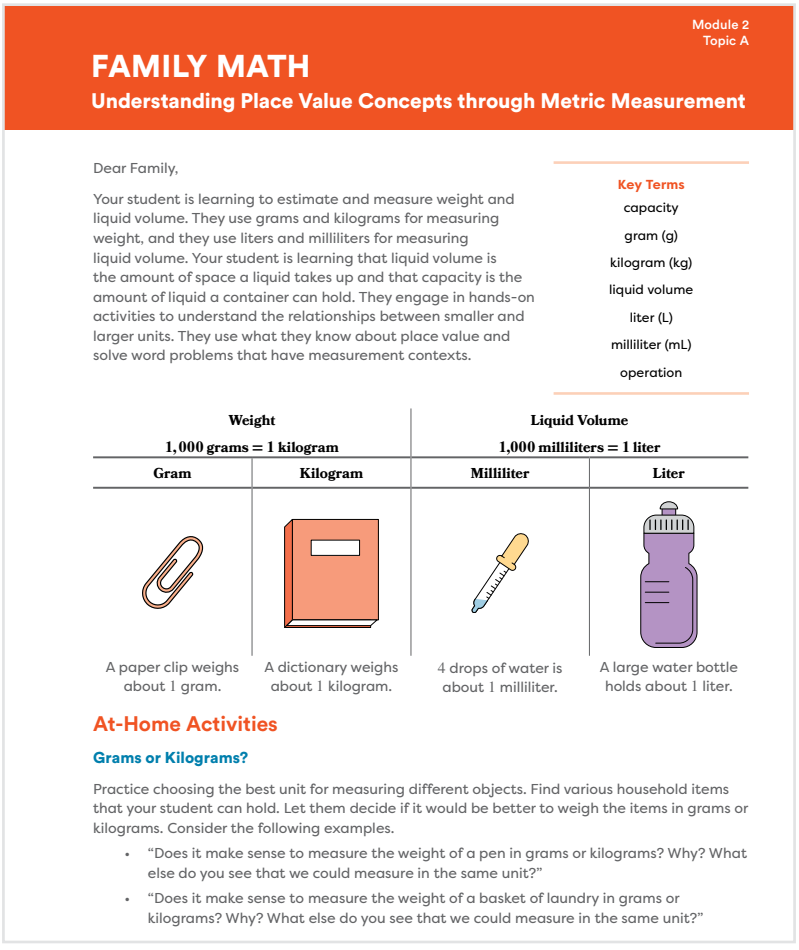
Refer to the Thinking Tool as you model self-talk and self-questioning as part of a think-aloud. You can suggest using the Thinking Tool at any time during individual or group work to prompt students to strategically reflect on their own performance.

Inside *Apply*

Apply gives students more practice with the concepts learned in class. There are three components in *Apply* that support students in deepening their understanding of the concepts covered in the daily lesson: Family Math, Practice, and Practice Partners.

Family Math

Family Math is a letter to families that describes the major concepts in the current topic. Each letter uses words and phrases that should be familiar to the student from the lessons in the topic. It includes visual supports that students can use to explain the concepts or strategies to their family, or that can help adults at home understand or unpack a concept. Family Math also includes simple and practical at-home activities to extend learning and help students see mathematics in their world.



Module 2
Topic A

FAMILY MATH

Understanding Place Value Concepts through Metric Measurement

Dear Family,

Your student is learning to estimate and measure weight and liquid volume. They use grams and kilograms for measuring weight, and they use liters and milliliters for measuring liquid volume. Your student is learning that liquid volume is the amount of space a liquid takes up and that capacity is the amount of liquid a container can hold. They engage in hands-on activities to understand the relationships between smaller and larger units. They use what they know about place value and solve word problems that have measurement contexts.

Key Terms

capacity
gram (g)
kilogram (kg)
liquid volume
liter (L)
milliliter (mL)
operation

Weight		Liquid Volume	
1,000 grams = 1 kilogram		1,000 milliliters = 1 liter	
Gram	Kilogram	Milliliter	Liter
A paper clip weighs about 1 gram.	A dictionary weighs about 1 kilogram.	4 drops of water is about 1 milliliter.	A large water bottle holds about 1 liter.

At-Home Activities

Grams or Kilograms?

Practice choosing the best unit for measuring different objects. Find various household items that your student can hold. Let them decide if it would be better to weigh the items in grams or kilograms. Consider the following examples.

- "Does it make sense to measure the weight of a pen in grams or kilograms? Why? What else do you see that we could measure in the same unit?"
- "Does it make sense to measure the weight of a basket of laundry in grams or kilograms? Why? What else do you see that we could measure in the same unit?"

Practice

Practice problems interleave and distribute practice. Interleaving practice means mixing different types of problems together in the same set. The mixture requires learners to discern and recall which knowledge, concepts, and strategies are appropriate. Distributing practice spaces out practice with a given concept or skill over time. This periodic practice helps students solidify their conceptual understanding and procedural skills, transfer knowledge to new applications, and build fluency.

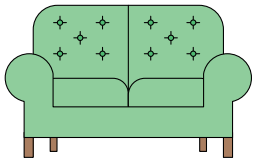
Each Practice is structured as two pages. The front page includes problems that represent learning from class that day. These problems are organized similarly to those in the Problem Set, with the final problem being no more complex than those on the Exit Ticket.

Circle the correct weight for each object.

1. 

(127 grams)

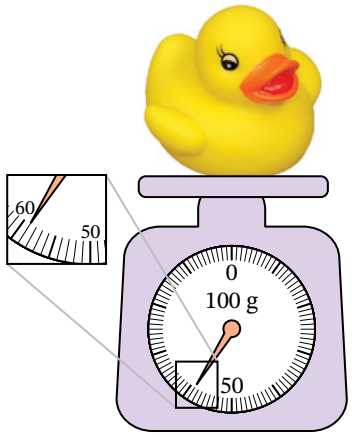
127 kilograms

2. 

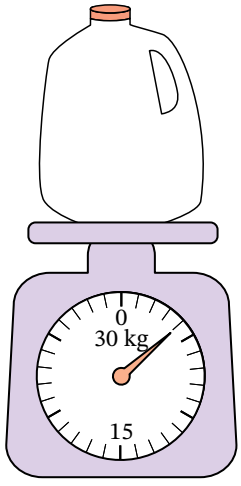
102 grams

(102 kilograms)

Read and write the weights. Write kg or g with each measurement.

3. 

59 g

4. 

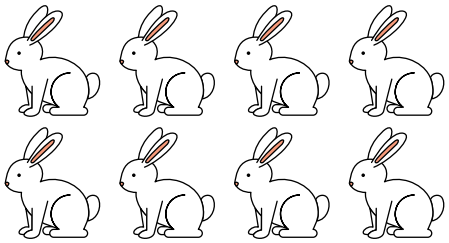
4 kg

The second page includes Remember problems. These problems help students recall previously learned concepts and skills. While Practice problems related to the day's lesson help solidify new learning, Remember problems keep students sharp with familiar concepts.

If there is no Problem Set in the day's lesson, the Practice only includes Remember problems. The Remember problems match the complexity of the proficiency indicators of the relevant Achievement Descriptors.

REMEMBER

5. Explain why the array represents 2×4 and 4×2.



Sample: The array shows that 2 rows of 4 is 8. The array also shows that 4 columns of 2 is 8. Changing the order of the factors doesn't change the product.

Practice Partners

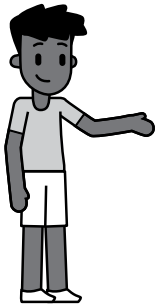
Practice Partners provide a unique kind of support. They take students through the thinking of a "partner" who is solving problems like those in the Practice. The partner represents the thinking required to approach and unpack the problem, using steps that are like those named and described in the lesson. If a term is formally introduced in a lesson, it appears on the Practice Partner in the partner's thinking.

Circle the correct weight for the object.

1.

115 grams

115 kilograms



I think about the weight of 1 gram and the weight of 1 kilogram.

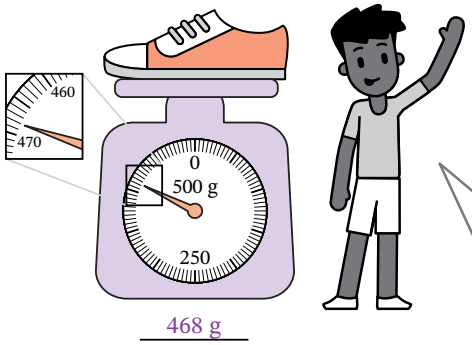
1 cube weighs 1 gram.

This large bag holds 1,000 cubes and weighs 1 kilogram.

I ask myself about the weight of the watch. Is it more like the weight of 115 cubes or the weight of 115 large bags of cubes?

Read and write the weight. Write kg or g.

2.



468 g

The g on the scale shows me that this scale weighs objects in grams.

I look at the interval from 460 to 470 in the zoomed-in section.

I point to the tick marks and count by ones from 460 to 470. I know each tick mark represents 1 gram.

I count by ones from 460 to the tick mark where the pointer is.

The shoe weighs 468 grams.

Inside the Digital Platform

The Great Minds Digital Platform is organized into five key curriculum spaces: Teach, Assign, Assess, Analyze, and Manage. On the digital platform, lessons include the same features as in the *Teach* book, as well as a few more elements that are unique to the digital space. For example, on the digital platform, the side navigation panel previews digital presentation tools, such as slides, that accompany lessons.

Each space within the digital platform supports you to maximize the features that *Eureka Math*^{2} *New York Next Gen* offers.

Teach

Teach contains all the information in the print version, as well as digital curriculum components such as assessments, digital interactives, and slides to project for students. Use this space to access the curriculum components you need for daily instruction.

Assign

Create assignments for your students by using any artifact in the *Eureka Math*^{2} *New York Next Gen* resource library in this space, such as Exit Tickets, Module Assessments, Classwork, removables, or problems for practice. You can launch assessments, view and monitor progress on assigned assessments, and score and analyze completed assessments.

Assess

From this space, you can access the Great Minds Library of digital assessments, where you can duplicate and adjust assessments. You can also assign several assessments at once from this space.

Analyze

Generate reports and view data about students' progress toward proficiency. Assessment reports provide insights, summaries of class performance, and student proficiency by item.

Manage

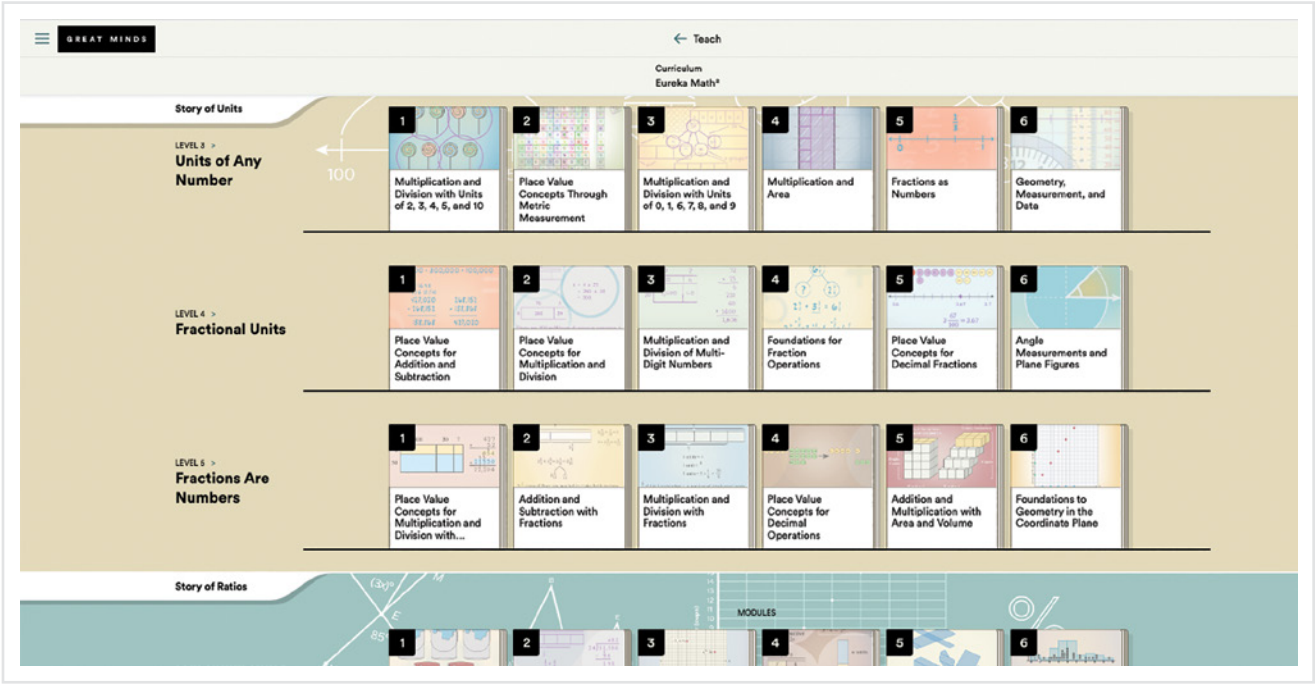
This Manage space allows administrators and teachers to view rostering data for their schools or classes. It is also where you can set or reset a student's password.

This section discusses Teach in detail. Visit the Help Center to read more about Teach as well as Assign, Assess, Analyze, and Manage.

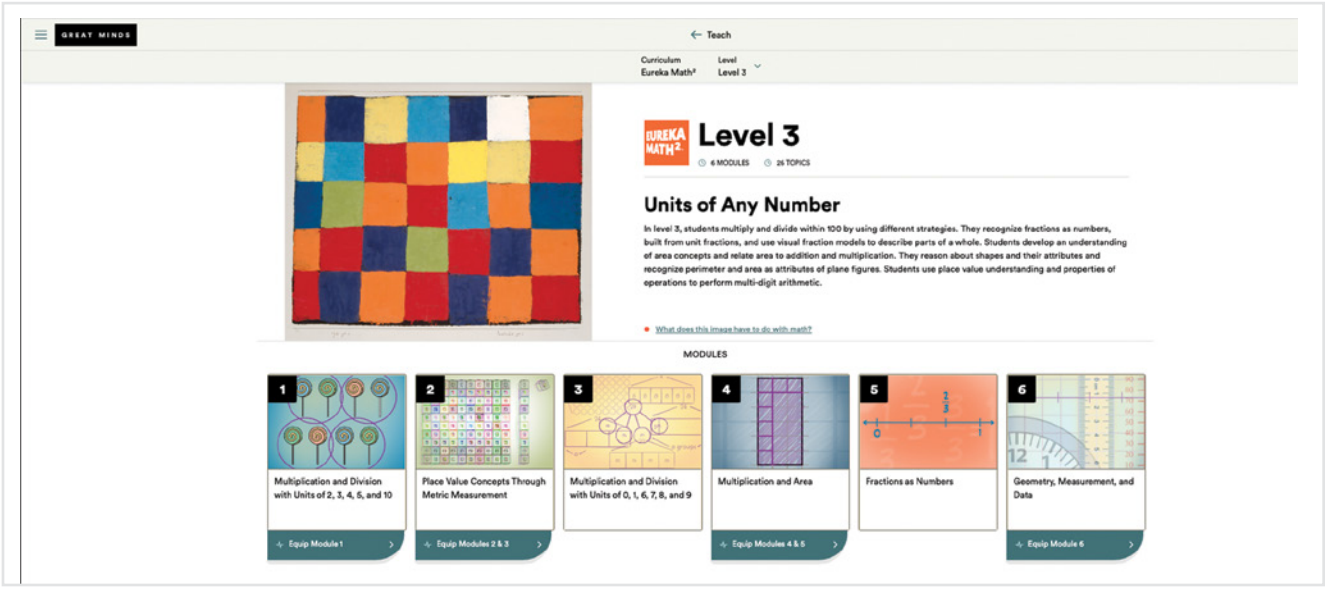
Teach

On the digital platform, use Teach to navigate to the curriculum, level, and module landing pages for easy access to different components.

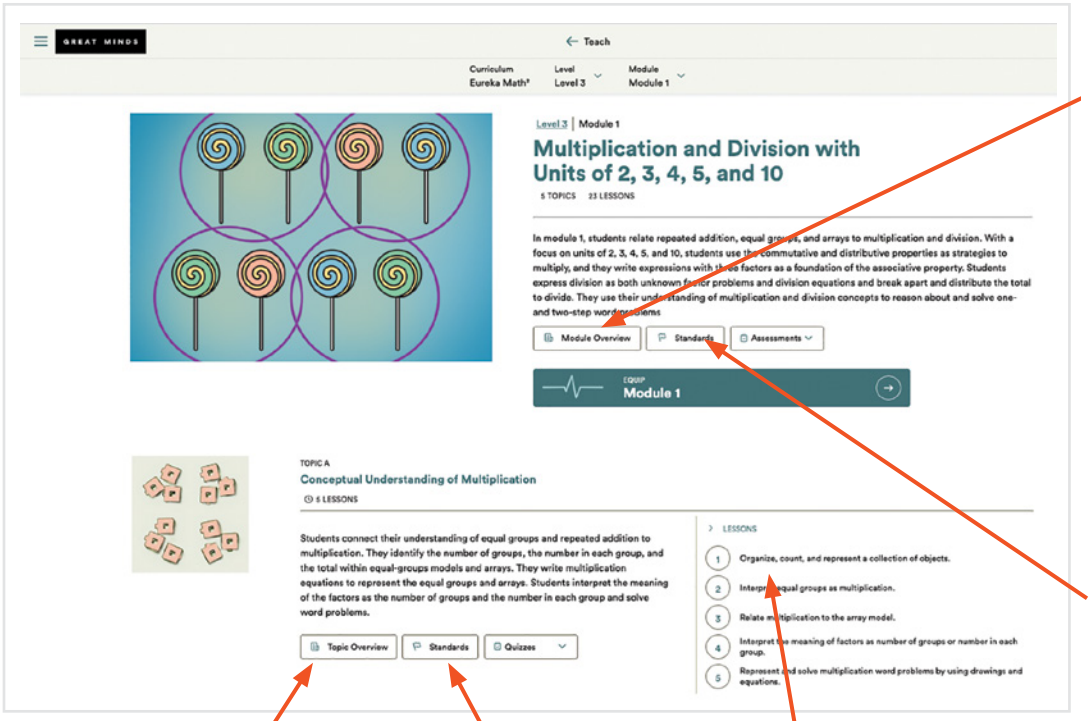
The curriculum landing page, or the bookshelf, gives easy access to the entire curriculum.



The grade-level landing pages provide a brief description of the year-long learning. Use the drop-down arrows in the top navigation panel to view different grade levels.



The module-level landing page houses all the module-, topic-, and lesson-level resources needed to teach each module.



The Module Overview includes resources from the *Teach* book, including Why, Terminology, Math Past, Module Assessments, Scoring Guides, and additional module-level resources.

Access the Achievement Descriptors and standards for the entire module.

Lessons are visible at a glance.

The Topic Overview includes the Progression of Lessons, Topic Quizzes, Scoring Guides, and topic-level resources.

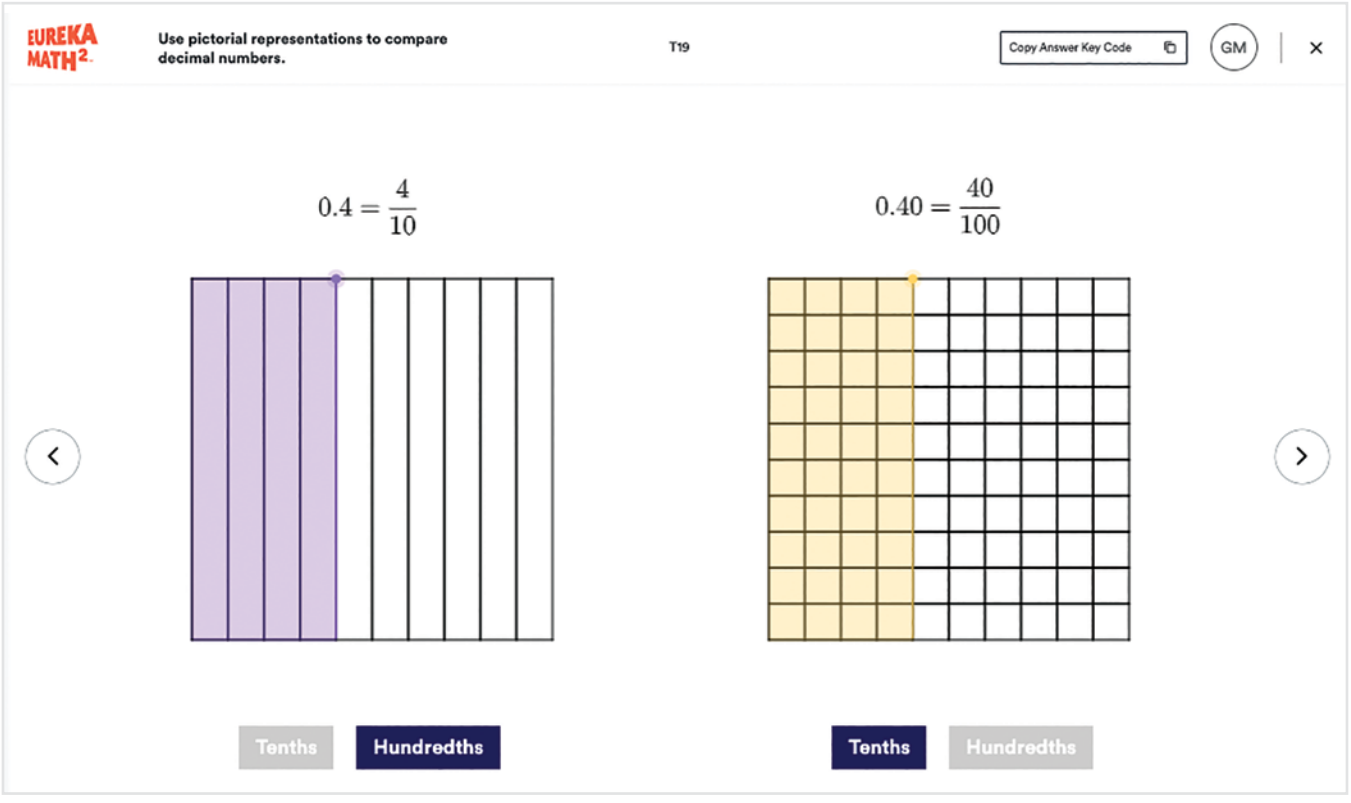
Access the Achievement Descriptors and standards for the topic.

Slides

Each *Eureka Math²* *New York Next Gen* lesson provides projectable slides that have media and content required to facilitate the lesson, including the following:

- Fluency activities
- Digital experiences such as videos, teacher-led interactives, and demonstrations
- Images and text from *Teach* or *Learn* cued for display by prompts such as *display*, *show*, *present*, or *draw students' attention to*
- Pages from *Learn* including Classwork, removables, Problem Sets, and Exit Tickets

Some slides contain interactive components such as buttons or demonstrations.



Teacher View

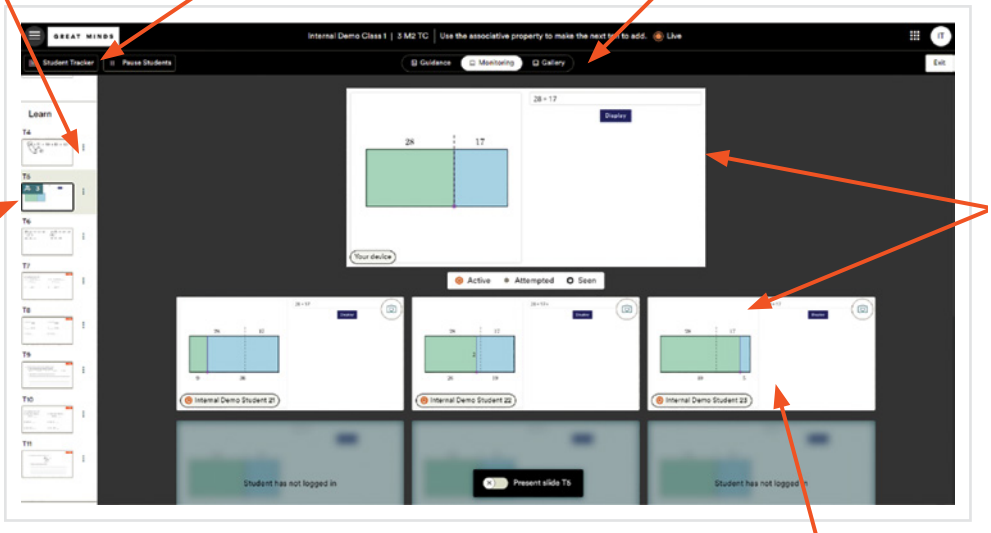
Lessons that include digital interactives are authored so that while you demonstrate the digital interactive, students engage with the demonstrations as a class. *Eureka Math² New York Next Gen* digital interactives help students see and experience mathematical concepts interactively. You can send slides to student devices in classroom settings where it feels appropriate to do so.

Use Teacher View to present, send slides to students, monitor student progress, and create student discussions. If you send interactive slides to students from this view, you can choose to view all students' screens at once or view each student's activity individually.

You can send interactive slides to students.

You can track the pace of the class and pause students as needed.

Toggle among Guidance, Monitoring, and Gallery modes to present, monitor student progress, and create student discussion points.



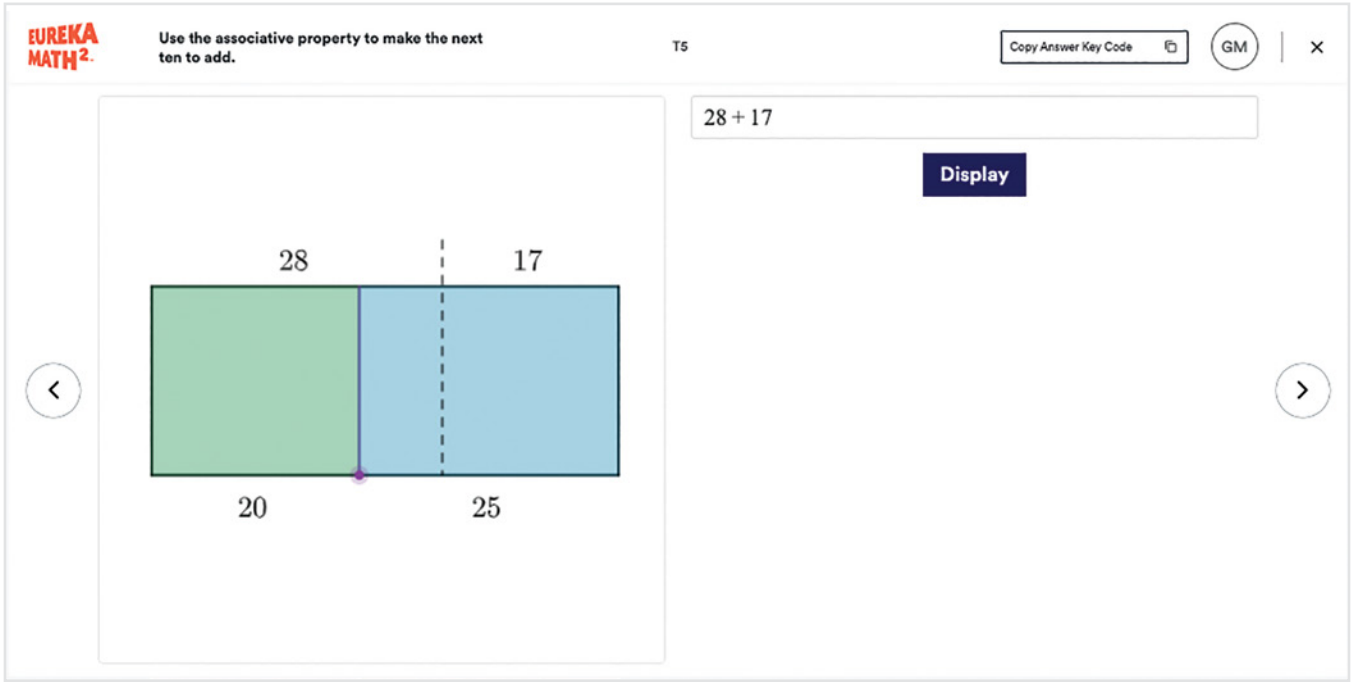
You can see the number of students active on each slide.

You can see your own display and students' work as they move through the interactive.

Add student work to the Gallery to create specific examples to analyze and critique.

Student View

Teacher demonstration slides contain interactives that you can send to student devices. Students use the interactives to engage directly with the mathematical concepts and receive immediate feedback.



Pacing

Year at a Glance

There are approximately 140 lessons for each grade level. Small groups of related lessons are organized into topics. Topics are organized into modules. The following table shows modules by title and gives the total number of lessons per year.

Module	K: Part–Part–Total	1: Units of Ten	2: Ten Tens
1	Counting and Cardinality	Counting, Comparison, and Addition	Place Value Concepts Through Metric Measurement and Data • Place Value, Counting, and Comparing Within 1,000
2	Two- and Three-Dimensional Shapes	Addition and Subtraction Relationships	Addition and Subtraction Within 200
3	Comparison	Properties of Operations to Make Easier Problems	Shapes and Time with Fraction Concepts
4	Composition and Decomposition	Comparison and Composition of Length Measurements	Addition and Subtraction Within 1,000
5	Addition and Subtraction	Place Value Concepts to Compare, Add, and Subtract	Money, Data, and Customary Measurement
6	Place Value Foundations	Attributes of Shapes • Advancing Place Value, Addition, and Subtraction	Multiplication and Division Foundations
Total	142 lessons	146 lessons	142 lessons

Instructional Days

Plan to teach one lesson per day of instruction. Each lesson is designed for an instructional period that lasts 60 minutes. Grade levels have fewer lessons than the typical number of instructional days in a school year. This provides some flexibility in the schedule for assessment and responsive teaching, and it allows for unexpected circumstances.

3: Units of Any Number	4: Fractional Units	5: Fractions Are Numbers
Multiplication and Division with Units of 2, 3, 4, 5, and 10	Place Value Concepts for Addition and Subtraction	Place Value Concepts for Multiplication and Division with Whole Numbers
Place Value Concepts Through Metric Measurement	Place Value Concepts for Multiplication and Division	Addition and Subtraction with Fractions
Multiplication and Division with Units of 0, 1, 6, 7, 8, and 9	Multiplication and Division of Multi-Digit Numbers	Multiplication and Division with Fractions
Multiplication and Area	Foundations for Fraction Operations	Place Value Concepts for Decimal Operations
Fractions as Numbers	Angle Measurements and Plane Figures	Addition and Multiplication with Area and Volume
Geometry, Measurement, and Data	Place Value Concepts for Decimal Fractions	Foundations to Geometry in the Coordinate Plane
148 lessons	142 lessons	138 lessons

Optional Lessons

Some lessons in each grade level are optional. Optional lessons are clearly designated in the instructional sequence, and they are included in the total number of lessons per grade level. Assessments do not include new learning from optional lessons.

Lessons may be optional for the following reasons:

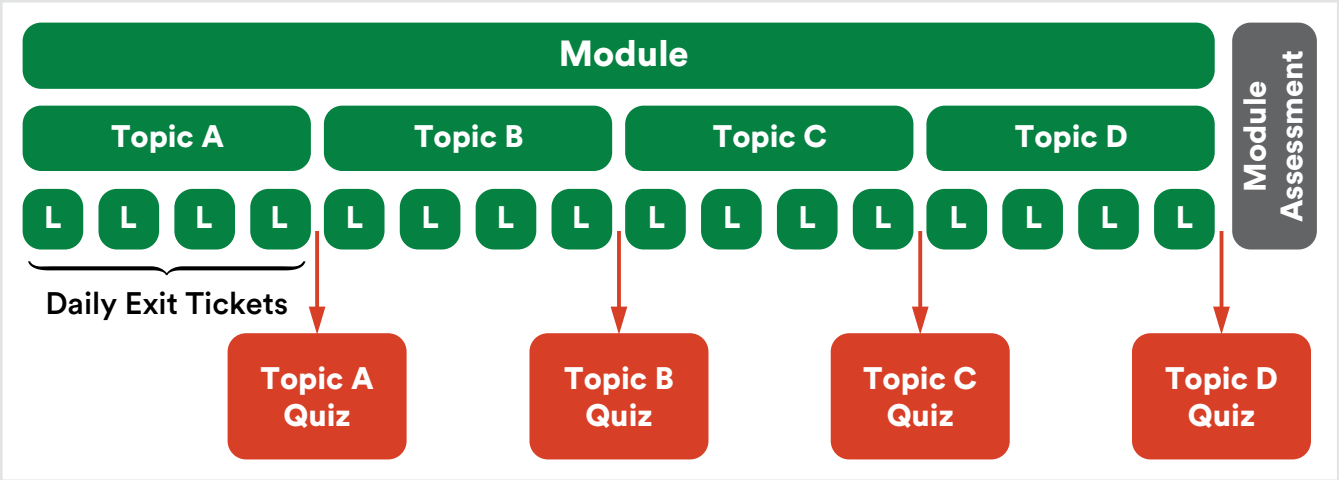
- The lesson is primarily for enrichment.
- The lesson offers more practice with skills, concepts, or applications.
- The lesson bridges gaps between standards.
- The lesson can be used more than once or anywhere within the instructional sequence.

Assessment Days

In addition to the lessons referenced in the previous table, *Eureka Math²* *New York Next Gen* provides assessments that can be given throughout the year at times you choose. Overall pacing, including assessment delivery, is flexible by design. There are about 30 total days in the year-long pacing for assessment and responsive teaching.

The following image shows the various assessments that are included in the *Eureka Math²* *New York Next Gen* core curriculum.[1] As the image suggests, Exit Tickets are designed for use at the end of each lesson. A Topic Quiz is available at the end of each topic. Make intentional choices about when to give Topic Quizzes. You might give them right after teaching the lessons in the topic or wait a day or two as students internalize their recent learning. The Module Assessment is typically given when module instruction is complete. The Module Assessment may be given immediately after finishing the lessons, or several days or even a week after closing the module. Choose when to administer the Module Assessment based on your students' needs and your school's calendar.

[1] See the Assessment section for a complete picture of Core Assessment and Premium Assessment pacing together.



Pacing Your Instruction

The total lesson count at each grade level and many of the elements in the lesson structure provide flexibility. As needed, use that flexibility to adjust pacing so that it meets the needs of your students or your school's schedule.

Focus on the major work of the grade.

College- and career-readiness standards are typically organized into the following clusters: major, supporting, and additional. At every grade level, the curriculum prioritizes standards in the major cluster by devoting more time to those standards overall and by sequencing modules to teach the major work as close to the start of the school year as possible. Standards in the major cluster appear early and are revisited over the course of the year so that students have ample opportunity to work with them. Whenever possible, the major work of the grade is naturally embedded in lessons even when the lesson objective targets supporting or additional work.

Use Fluency and Practice to reinforce skills and concepts as needed.

Interleaved practice presents different skills and concepts in a single session so that learners discern and recall which knowledge and strategies are appropriate. Distributed practice presents a single skill or concept in a single session and systematically spaces out practice sessions over time. The interleaved and distributed practice embedded in Fluency and Practice maximizes students' readiness for the grade-level content in the lessons you teach.

Distributed practice will also help you maintain pacing even when your students have unfinished learning. Rather than reteaching the same lesson to address unfinished learning, allow the distributed practice to provide natural opportunities to continue teaching. Help students access the current lesson or upcoming lessons by using Fluency activities to practice previously taught content.

Use observational assessment data to make decisions.

Use student performance during lessons and on Exit Tickets to make strategic decisions. Look at upcoming content, and based on your observations, choose the pathway that best advances student understanding and allows students to demonstrate what they know. For example, lessons may provide access to a concept by teaching the concept in more than one way, but students may not need to achieve proficiency with every strategy or method taught.

Think flexibly about how and when to use components.

Some Fluency activities can be used at other times of day, or they can be completed by students independently. Read the statement that describes the purpose of the Fluency activity. The purpose statement will help you determine whether your students will most benefit from engaging in the activity immediately before the lesson or at a different time.

You can also adjust the Problem Set that is provided in the *Learn* book. For example, depending on the needs of your students, consider decreasing the amount of time they spend on the task. Or specify which problems students should complete independently during class and save the other problems for another time.

There may be times when you decide not to administer every available assessment for a module. For example, you may decide not to give the final Topic Quiz if you plan to give the Module Assessment immediately after finishing the module's lessons. You may also find that after administering an assessment you have additional class time. Use this additional time as an

opportunity for responsive teaching. The following list offers some suggested resources or activities to use for reteaching, preteaching, extending, or enriching learning.

- Unused practice problems (e.g., from Problem Sets)
- Fluency activities
- Word problems
- Instructional routines, such as Math Chat or Which One Doesn't Belong
- Counting collections
- Games from lessons
- Supporting activities from *Eureka Math² Equip™: New York Next Gen* (Premium Assessment)

Expect students to develop proficiency over time.

Students achieve proficiency with the standards over time. Keep moving through lessons even when your students demonstrate only partial proficiency in the moment. Modules and lessons build student knowledge steadily so that students meet grade-level expectations by the end of the school year, and the curriculum's assessments are designed accordingly. Distributed practice of each concept and skill is built into the curriculum to help students achieve and maintain proficiency. Set a goal to have 80% of students demonstrate proficient performance on ongoing assessments. Use small group work or short exercises to support students who need more time or different instruction to understand the concepts.

Lesson Facilitation

Eureka Math^2 *New York Next Gen* lessons are designed to let students drive the learning through sharing their thinking and work. Varied activities and suggested styles of facilitation blend guided discovery with direct instruction. The result allows teachers to systematically develop concepts, skills, models, and discipline-specific language while maximizing student engagement.

Effective Delivery

No matter what style of facilitation lessons suggest, effective delivery prioritizes student engagement; promotes student-to-student discussion; fosters students' ownership of and sense of belonging in the mathematics community; and helps students make connections within mathematics and across disciplines. The following are some of the ways that the curriculum supports these elements of your instruction.

Lessons prioritize **student engagement** by

- maximizing the number of students actively participating at any given time,
- creating space for students to share, discuss, and self-reflect,
- inviting students' curiosity by posing questions or scenarios that spur them to notice and wonder, and
- presenting intriguing artifacts or questions that create a need for new knowledge.

Lessons promote **student-to-student discussion** by

- employing routines that encourage student-to-student dialogue,
- using open-ended questions and scenarios to generate opportunities for authentic class discussion, and
- suggesting when students might use the leveled sentence starters provided in the Talking Tool to participate in discussions.

Lessons foster **student ownership and belonging** by

- including guided discovery so that students generate, test, share, critique, and refine their ideas,
- incorporating the Standards for Mathematical Practice by design so that opportunities to engage with them arise naturally,
- adjusting for age-appropriateness and reading proficiency in student materials to maximize students' independence, and
- providing tools to support students with their processing and verbal expression.

Lessons help **students make connections** by

- building content and language sequentially so that it's easier to relate new learning with prior knowledge,
- incorporating Math Past, a component that contextualizes current learning within the history of mathematics, and
- using artwork to convey broad artistic and mathematical principles.

Sample Dialogue

Lessons include sample dialogue that represents how the teacher and students in a classroom might explore concepts and problems. Sample dialogue gives a sense of how instruction might look and feel. It is not a script and should not be used that way. Instead, use the sample dialogue as if you are observing a class taught by a trusted colleague. For example, the sample dialogue can help you

- identify lines of questioning that advance students toward the objective(s),
- determine when and how to use precise terminology, or
- navigate content that might be new to you or challenging to teach or learn.

Sample dialogue often includes possible student responses or reasoning. However, sometimes the lesson advances without relying on a certain kind of response, or sometimes responses are expected to vary so much that possible student responses are not provided. For example, sample student responses are not usually included with a question that's meant to be used as a simple turn and talk. When they are present, the provided responses serve as examples of the kind of thinking you might expect to hear. As you listen to your own students, consider using the sample responses to help you identify teachable moments.

Classroom Culture

Consider the following ideas to help set norms that support a collaborative culture:

- We value and respect each other's contributions. Everyone has knowledge that is worth listening to and building on.
- We are all expected to explain and discuss our thinking.
- We will solve problems in many different ways.
- We embrace a growth mindset. Making mistakes is part of learning. We will analyze and learn from the mistakes we make.

As the culture of your mathematics classroom becomes established, you may feel the need to shift your instruction. For example, students will begin to share, compare, and critique with confidence. Respond by challenging yourself to maximize student action and conversation over teacher action and speech. Leverage the structures and questions within lessons to increase guided discovery and connection-making so that students generate ideas. Your primary roles then evolve to navigating and developing their emerging mathematical thinking.

Instructional Routines

Eureka Math² New York Next Gen uses instructional routines, or predictable patterns of classroom interaction, to allow students and teachers to focus on mathematical content. Routines intentionally support engagement, discussion, and building content knowledge. Directions for a routine are included in a lesson every time the routine is used. That way, the specific facilitation guidance is immediately available to you as you work through the lesson. Many of the same routines appear across grade levels from kindergarten to Algebra I, using age-appropriate variations.

Fluency

Fluency uses routines that promote engagement, require participation from every student, and develop automaticity with counting and calculating. Students become familiar with fluency routines because the routines are used consistently across modules and grade levels, allowing for efficient teaching and learning. Some of the primary fluency routines are choral response, Whiteboard Exchange, count by, and Sprint.

Launch, Learn, Land

The Launch, Learn, and Land lesson components intentionally include routines that

- promote student engagement in the Standards for Mathematical Practice,
- promote student-to-student dialogue and integrate reading, writing, and listening,
- align to Social Emotional Learning (SEL) core competencies, and
- align to Stanford Language Design Principles.

Although lessons embed many routines, the following routines consistently appear by name within lessons across grade levels. This helps students recognize them and develop ownership over the routines.

Math Chat	Creates open-ended space for sharing mental math strategies and developing number sense, flexibility, efficiency, and accuracy.
Always Sometimes Never	Promotes sense-making and mathematical discussion as students support a claim with examples and nonexamples.
Which One Doesn't Belong?	Promotes metacognition and mathematical discourse as students use precise language to compare different examples.
Co-Construction	Provides structure for contextualizing and decontextualizing problems, which helps students build abstract reasoning.
Critique a Flawed Response	Promotes effective communication techniques for critiquing others' work, correcting errors, and clarifying meaning.
Take a Stand	Supports students in making arguments and critiquing the reasoning of others.
Five Framing Questions	Supports students in analyzing a work sample or solution strategy by guiding them through stages of discovery.
Stronger, Clearer Each Time	Provides a structured, interactive opportunity for students to revise and refine their written language through rehearsal.
Numbered Heads	Helps groups build consensus and holds each student accountable for the material.

Problem Solving Routines

Problem solving routines give students a systematic way to approach a wide range of situations. Many entry points to the routines provide access for students working at different proficiency levels.

Students in grades 1–5 use the Read–Draw–Write (RDW) process as a way to make sense of problems, choose and apply mathematics, and solve.

Read the problem all the way through. Then reread a chunk at a time. As you reread, ask yourself, "Can I draw something?" Then ask, "What can I draw?"

Draw to represent the problem as you reread. Add to or revise your drawing as you uncover new information or discover what is unknown. As you draw, label what is known and what is unknown. When you finish rereading and drawing, ask yourself, "What does my drawing show me?" Let your drawing help you find a way to solve.

Write number sentences or equations to represent your thinking. Solve. Then use your solution to write a statement that answers the original question.

The RDW process links to the following Read–Represent–Solve–Summarize (RRSS) process used in grades 6–8.

Read the problem all the way through. Ask yourself, "What is this problem asking me to find?" Then reread a chunk at a time. As you reread, ask yourself, "What do I know?" Model the situation, possibly with tables, graphs, diagrams, or equations.

Represent the problem with your chosen model. Ask yourself, "What labels do I use on the table, graph, or diagram?" and "How should I define the variables?" As you work, ask yourself, "Are the known and the unknown clear in the model?" Add to or revise your model as necessary.

Solve the problem to determine whether your result answers the question(s). Ask yourself, "Does my answer make sense? Does it answer the question?" If not, revise or create another model. Then ask yourself these questions again using your new result.

Summarize your result and be ready to justify your reasoning.

Universal Design for Learning

Universal Design for Learning (UDL) is a framework based on current research from cognitive neuroscience that recognizes learner variance as the norm rather than the exception. The guiding principles of the UDL framework are based on the three primary networks of the brain. Although the concept of UDL has roots in special education, UDL is for all students. When instruction is designed to meet the needs of the widest range of learners, all students benefit. *Eureka Math² New York Next Gen* lessons are designed with these principles in mind. Lessons throughout the curriculum provide additional suggestions for Engagement, Representation, and Action & Expression. Learn more about UDL in *Eureka Math² New York Next Gen* here.

Multilingual Learner Support

Multilingual learners, or learners who speak a language other than English at home, require specific learning supports for gaining proficiency with the English needed to access the mathematics. Research suggests that best practices for these learners include opportunities and supports for student discourse and for using precise terminology. In addition to precise domain-specific terminology, high-impact academic terminology that supports learners across learning domains is explicitly introduced and used repeatedly in various contexts to build familiarity and fluency across the grade levels. *Eureka Math² New York Next Gen* is designed to promote student discourse through classroom discussions, partner or group talk, and rich questions in every lesson. Learn more about supporting multilingual learners in *Eureka Math² New York Next Gen* here.

Readability

A student's relationship with reading should not affect their relationship with math. All students should see themselves as mathematicians and have opportunities to independently engage with math text. Readability and accessibility tools empower students to embrace the mathematics in every problem. Lessons are designed to remove reading barriers for students while maintaining content rigor. Some ways that *Eureka Math² New York Next Gen* clears these barriers are by including wordless context videos, providing picture support for specific words, and limiting the use of new, non-content-related vocabulary, multisyllabic words, and unfamiliar phonetic patterns. Learn more about how *Eureka Math² New York Next Gen* supports readability here.

Assessment

The assessment system in grades 3 through 5 helps you understand student learning by generating data from many perspectives. The system is composed of the following Core Assessment and Premium Assessment components:

- Lesson-embedded Exit Tickets
- Topic Quizzes,
- Module Assessments
- Pre-Module Assessments in *Eureka Math²* *Equip: New York Next Gen*
- Benchmark Assessments

All *Eureka Math²* *New York Next Gen* assessments are considered formative because they are intended to inform instruction. The assessments may also be considered summative when you choose to use the data to produce a grade or report that becomes part of a student, school, or district record.

On its own, a single assessment does not show a complete picture of student progress. For example, a short assessment might use a single question to assess student understanding of part of a standard, thus producing a limited perspective. Use a combination of assessments and data to get a definitive picture of or to produce a grade for the subject.

Components

Exit Tickets

Exit Tickets are short, paper-based assessments that close lessons. These assessments use at least one problem, question, or writing prompt 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.

In a typical classroom, most students with basic understanding can finish within 3–5 minutes. In some settings, honoring the timeframe is more important than requiring students to finish. For example, a student's inability to finish within 5 minutes may be valuable information. In other settings, you may extend the time to allow all students to finish as appropriate.

Exit Tickets are not graded. They are paper based so that you can quickly review and sort them. Occasionally, an alternative assessment activity may substitute for an Exit Ticket at the end of a lesson.

Topic Quizzes

Typical Topic Quizzes consist of 4–6 items that assess proficiency with the major concepts from the topic. Topic Quizzes

- take 25–30 minutes to complete in a typical setting,
- include Depth of Knowledge (DOK) 1 and 2 items,
- are intended for digital administration, with a paper-based option, and
- are 100% machine scorable when given digitally.

You may find it useful to grade Topic Quizzes. There are three analogous versions of each Topic Quiz available digitally. Analogous versions target the same material at the same level of cognitive complexity. However, typical items on analogous versions are not clones of the original version. Use the analogous versions to give retakes, with reteaching or additional practice between takes, until students score proficient or above.

Module Assessments

Typical Module Assessments consist of 6–10 items that assess proficiency with 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. These assessments use a variety of question types, such as constructed response, multiple select, multiple choice, single answer, and multi-part. Module Assessments

- take up to one class period to complete in a typical setting,
- include DOK 1, 2, and 3 items,
- are intended for digital administration, with a paper-based option, and
- are 50–70% machine scorable when given digitally.

You may find it useful to grade Module Assessments. There are two analogous versions of each Module Assessment available digitally. Analogous versions target the same material at the same level of cognitive complexity. However, typical items on analogous versions are not clones of the original version. Use the analogous versions to give retakes, with reteaching or additional practice between takes, until students score proficient or above.

Reference Sheets

In grade 5, the curriculum provides a reference sheet that students may use when they take assessments. Reference sheets give information according to the following guidelines:

- When students are expected to apply a formula but are not explicitly expected to know the formula, the reference sheet includes that formula.
- When students are expected to know and apply a formula, the reference sheet does not include the formula.

Reference sheets look similar to those provided with state summative assessments. Periodic experience with reference sheets builds students' confidence with how to use them.

Premium Assessment Components

Pre-Module Assessments

Eureka Math² Equip: New York Next Gen empowers teachers to identify and support students' unfinished learning. There are three components of *Eureka Math² Equip: New York Next Gen.*

- Pre-Module Assessments focus on assessing foundational knowledge essential to the content of upcoming lessons.
- Associated reports make it easy to identify student-specific needs and to create flexible student groups.
- Supporting activities build foundational knowledge when data show that students need it. These activities are short bursts of just-in-time instruction.

All three components work together to reduce obstacles that may prevent students from accessing content so they can engage with the mathematics at their grade level.

Each *Eureka Math² Equip: New York Next Gen* Pre-Module Assessment targets foundational knowledge for the upcoming modules. Foundational knowledge refers to concepts and skills that come from previous grade levels or, occasionally, from earlier modules within the grade level. These assessments do not comprehensively assess all related knowledge from previous grade levels. They do assess students' understanding of foundational knowledge that is essential for accessing the material in the upcoming module(s).

Every grade level has four Pre-Module Assessments. Modules 1 and 6 each have their own assessment. There is one assessment for modules 2 and 3 and one assessment for modules 4 and 5. Consolidating two modules into a single assessment gives teachers time to implement supporting activities before the foundational knowledge they address is required. Consolidating also paces *Eureka Math² Equip: New York Next Gen* assessments so that they work well with the recommended schedule for Benchmark Assessment administration. Pre-Module Assessments can be given digitally or as a paper-based assessment.

Pre-Module Assessments are not graded.

Benchmark Assessments

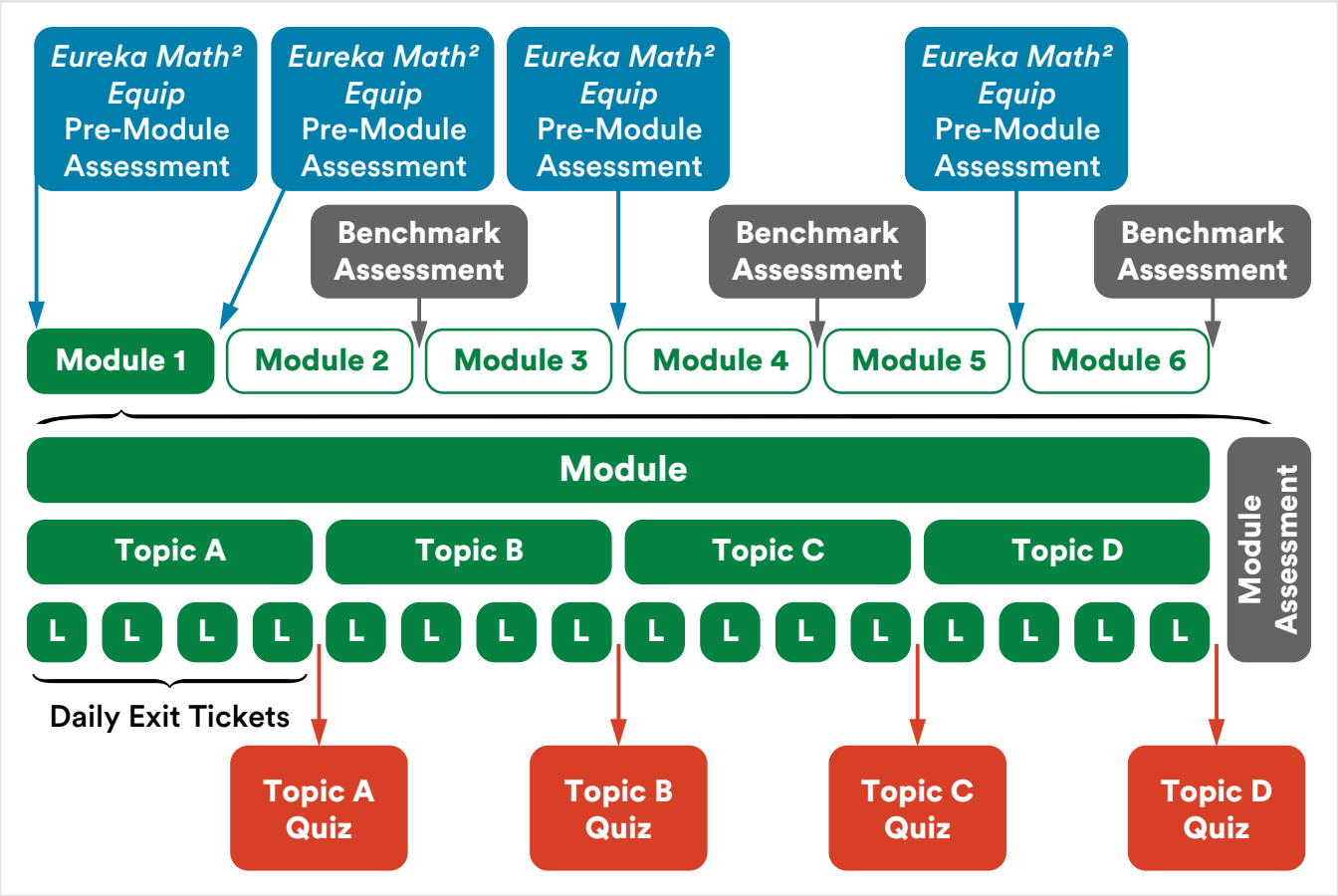
Benchmark Assessments provide a summative measure of the most important content taught in the grade level up to the point of administration. There are three Benchmark Assessments throughout the year, administered after modules 2, 4, and 6.

- Benchmark 1 assesses the key learnings from both modules 1 and 2.
- Benchmark 2 focuses on the key learnings from modules 3 and 4, but also reassesses a subset of key learnings from modules 1 and 2 (which are first assessed in Benchmark 1).
- Benchmark 3 primarily assesses key learnings from modules 5 and 6 and a subset of key learnings from modules 1–4.

In grades 3–5, Benchmark Assessments consist of two sessions and can be given over more than one day. Each session typically consists of 10–15 items. Benchmark Assessments are digitally administered and machine scored.

You may find it useful to grade Benchmark Assessments and use the data to report on student progress toward year-end expectations.

Eureka Math² New York Next Gen Core Assessment and Premium Assessment combine to offer the most complete picture of student learning across the school year. The following image shows how the two elements work together.



Achievement Descriptors

Achievement Descriptors, or ADs, are standards-aligned descriptions of what students should know and be able to do after having completed the lessons in a given module. ADs combine content from different standards to concisely communicate the work of the module. The ADs describe proficiency for the module, and every module has a unique set of ADs.

Proficiency Indicators

Each AD has its own set of proficiency indicators. Proficiency indicators are more detailed than ADs and help you analyze and evaluate what you see or hear in the classroom, as well as what you see in students' written work. Each AD has up to three indicators that align with a category of proficiency: Partially Proficient, Proficient, or Highly Proficient.

Assessment items target specific categories of proficiency according to the following guidelines:

- Items that target a Partially Proficient indicator assess the AD at a lower level of cognitive complexity than what proficiency for the grade requires.
- Items that target a Proficient indicator assess the AD at the full grade-level expectation.
- Items that target a Highly Proficient indicator assess the AD beyond what is explicitly called for in the standards. However, these items do not exceed the limitations of the grade.

Proficiency Levels

On each assessment, student performance aligns with one of five categories and letter grades: Not Yet Proficient (F), Partially Proficient (D), Inconsistently Proficient (C), Proficient (B), or Highly Proficient (A). A description for each category follows.

Not Yet Proficient

Performance shows that either the student is not progressing toward proficiency with grade-level expectations or there is insufficient evidence to determine the level of proficiency. At the module level, the student demonstrates

- little to no use of advanced strategies and limited use of lower-level strategies,
- little to no awareness of appropriate and familiar applications,
- little to no ability to construct viable arguments that support the student's reasoning, and
- little to no recognition and selection of any appropriate method.

Performance indicates that the student likely needs support to fully meet expectations.

Partially Proficient

Performance shows some progress toward proficiency with grade-level expectations. At the module level, the student demonstrates partial proficiency through

- the limited use of advanced strategies or the occasional use of lower-level strategies,
- an adequate awareness of appropriate and familiar applications,
- an ability to construct partially viable arguments (or a limited ability to construct viable arguments) that minimally support the student's reasoning, and
- a limited recognition and selection of efficient methods, or an occasional recognition and selection of less efficient methods.

Performance indicates that the student may need support to fully meet expectations.

Inconsistently Proficient

Performance shows inconsistent progress toward proficiency with grade-level expectations. At the module level, the student demonstrates many of the qualities described in Proficient but exhibits these qualities inconsistently.

Performance indicates that the student may need additional practice to achieve consistency and to fully meet expectations.

Proficient

Performance shows progress toward proficiency with grade-level expectations. At the module level, the student demonstrates proficiency through

- the occasional use of advanced strategies or the regular use of lower-level strategies,
- an awareness of a variety of new applications,
- an ability to construct viable arguments that adequately support the student's reasoning,
- an ability to moderately critique the reasoning of others, and
- an occasional recognition and selection of the most efficient methods or a consistent recognition and selection of less efficient methods.

Highly Proficient

Performance shows advanced progress toward proficiency with the content of the grade-level expectations. At the module level, the student demonstrates high proficiency through

- the regular use of advanced strategies,
- an awareness of—and ability to work within—a broad variety of new applications,
- an ability to clearly and concisely construct viable arguments that fully support the student's reasoning and to thoroughly critique the reasoning of others, and
- a consistent recognition and selection of the most efficient methods.

Proficiency Over Time

Because some standards are not completely covered over the course of a single module, Achievement Descriptors in several different modules may align with the same standard. Do not expect students to achieve full proficiency with the standard until you teach all of the modules that include related ADs.

Also, at some grade levels, students are expected to be fluent by the end of the year, although they may achieve fluency at different points during the year.

Scoring

Scoring Guides

You may find it useful to score Topic Quizzes and Module Assessments. When these assessments are administered digitally, most items are machine scorable. If you give the assessments in a paper and pencil format, score them by hand.

Every assessment has a scoring guide that shows the alignment between each item and an Achievement Descriptor and a proficiency indicator. The scoring guide tells how many points are possible for each item or part of an item. It also tells whether the scoring for an item is dichotomous (i.e., all or nothing) or polytomous (i.e., each embedded correct response earns partial credit). This is the scoring guide for a grade 3 Topic Quiz.

Item Number	Achievement Descriptor	Proficiency Indicator	Raw Points	×	Scale Factor	=	Possible Points	Scoring Type	Notes
1	3.Mod1.AD1	P	1	×	2	=	2	Dichotomous	Both correct responses must be identified to earn 2 points.
2	3.Mod1.AD5	PP	1	×	3	=	3	Polytomous	Each correct response is worth 1 point.
3	3.Mod1.AD6	PP	1	×	3	=	3	Dichotomous	Both correct responses must be identified to earn 3 points.
4	3.Mod1.AD6	P	1	×	2	=	2	Polytomous	Each correct response is worth $\frac{2}{3}$ points.
5	3.Mod1.AD8	P	3	×	2	=	6	Polytomous	Each correct response is worth 2 points.

Target Proficiency Indicator	Scale Factor
Highly Proficient	1
Proficient	2
Partially Proficient	3

The scoring guide uses a scale factor to weight items differently. Items that target high proficiency carry less weight because it is likely that the least number of students will answer them correctly. Items that target partial proficiency carry more weight because it is likely that the greatest number of students will answer them correctly.

The following example shows sample students' scores on the grade 3 Topic Quiz referred to earlier. The quiz has a maximum scaled score of 16 points.

Item Number	Student 1	Student 2	Student 3	Student 4	Student 5
1	0	0	2	2	2
2	1	3	3	3	2
3	3	3	3	3	3
4	0	0	1.33	1.33	2
5	0	0	2	4	6
Overall	4	6	11.33	13.33	15
Total Possible	16	16	16	16	16

Scoring Notes

On Module Assessments, some items must be hand scored, whether they are given digitally or in a paper and pencil format. Scoring notes for these items are in the Module Assessment's answer key. These scoring notes include a sample student response and tell how many points are possible for the item or for its parts. Scoring notes detail how students earn points, and the notes classify the points in terms of reasoning or computation. The following are the scoring notes from a grade 4 module assessment.

Scoring Notes for Item 6

Points	Description
2	Student response includes the following components: • Reasoning: 1 point The student correctly explains the mistake Pablo made. • Computation: 1 point The student provides the correct product. Pablo decomposed 14 into 1 one and 4 ones. He should have decomposed 14 into 1 ten and 4 ones. The correct product is 112.
1	Student response includes 1 of the 2 components.
0	Student response is missing or entirely incorrect.

Scoring Multi-Part Items

- On a hand-scored multi-part item, students earn credit for a correct response to part of the item that is based on an incorrect response to an earlier part of the same item. For example, if part B of an item is answered correctly by using the incorrect response to part A, the response for part B is marked correct.
- On machine-scored multi-part items, correct responses are predefined and cannot be modified. As a result, an incorrect response to one part may result in an incorrect response on another part, and neither response earns points. For example, if a student answers part B of an item correctly by using an incorrect response to part A, the student earns no points on those parts.

Grading

Adjusting raw percentage scores allows for a student's proficiency level to determine their grade, rather than a student's grade determining their proficiency level. In a system in which a grade determines proficiency level, a raw percentage computation might convert a score of 5 points out of 10 into 50%. That 50% would result in a failing grade even though the student may be partially proficient. Raw percentage computations can also allow one very low score, such as 20% on one quiz, to result in a failing grade for the marking period. That grade for the marking period may not accurately communicate the student's proficiency. Using adjusted scoring makes it possible for students to recover from a single low score and builds scores to show partial proficiency more clearly.

Determine a student's proficiency level and give a letter grade by converting the student's raw percent into an adjusted score. Use the following process to compute an adjusted score:

- Divide a student's total earned points by the total possible points.
- Enter that result into the adjusted score converter on the digital platform.
- Use the value from the adjusted score converter to determine a grade.

Raw Percent Range		Adjusted Score Range		Proficiency Level	Letter Grade
0	35	0	59	Not Yet Proficient (NYP)	F
36	69	60	69	Partially Proficient (PP)	D
70	79	70	79	Inconsistently Proficient (IP)	C
80	92	80	92	Proficient (P)	B
93	100	93	100	Highly Proficient (HP)	A

This is one option for converting a raw percent into an adjusted score and letter grade. This approach is built from raw percent ranges, adjusted score ranges, and a piecewise-defined function. As needed, customize the ranges to meet the needs of your school or district.

The following example shows how the raw percent, adjusted score, letter grade, and proficiency level correlate based on the sample scores from the grade 3 Topic Quiz referred to earlier.

Item Number	Student 1	Student 2	Student 3	Student 4	Student 5
1	0	0	2	2	2
2	1	3	3	3	2
3	3	3	3	3	3
4	0	0	1.33	1.33	2
5	0	0	2	4	6
Overall	4	6	11.33	13.33	15
Total Possible	16	16	16	16	16
Raw Percent	25%	38%	71%	83%	94%
Adjusted Score	54%	61%	71%	83%	94%
Proficiency Level	NYP	PP	IP	P	HP
Letter Grade	F	D	C	B	A

Plan to Teach

Study a Module

Begin your planning process by familiarizing yourself with the module's story. Use the following guide to help you review the module as a whole.

Preview the Learning

Module Resource	Guiding Questions
Read the Overview to preview the learning.	• What big ideas does the module teach? • How do the topic titles relate to the module title? What does that tell me about how the concepts are organized? • Which strategies, models, and language will my students use?
Read the Before This Module and After This Module sections in the Overview to understand the coherence between modules.	• What concepts, skills, and language can I expect my students to bring to the new learning? • How does the work of this module support learning in future modules?

Investigate the Development of Learning

Module Resource	Guiding Questions
Review the Contents to see the module's structure.	• How do the lesson objectives relate to the topic titles? What does that tell me about the development of learning across the module? • How many lessons are in the module and in each topic? • How does my school's calendar work with the number of instructional days?
Read the Why section for insight into the module's instructional design and pedagogical choices.	• What does the Why section tell me about the module's design? • In what ways does this information change the way I'm thinking about the content, sequence, models, strategies, and language in this module?

Module Resource	Guiding Questions
Read the Achievement Descriptors: Overview section to get a quick sense of the major learning in the module.	• What are the Achievement Descriptors for this module? • How do the Achievement Descriptors relate to the content standards?
Preview the additional module resources: • Standards • Supplemental Instructional Guidance • Terminology • Math Past • Materials	• What standards are addressed in this module? If post-test standards are included, how do they support the learning of this module? • What changes will I make to my instruction based on the Supplemental Instructional Guidance? • What familiar terminology will I reinforce as I teach the module? What new terminology will I introduce as I teach the module? • How does the Math Past provide human and/or historical context for the learning of this module? • What materials do I need to gather for the lessons in this module? What do I need to prepare in advance?

Explore the Assessment

Module Resource	Guiding Questions
Read the Achievement Descriptors: Proficiency Indicators section to understand what proficiency looks like in this module.	• What does proficiency with the content of this module look like? • How will I use this information to evaluate student performance?
Complete the Module Assessment to understand how students will be assessed on their learning.	• How does the Module Assessment assess the learning in this module? • How do the models, strategies, and language of the module appear in this assessment? • What variety of strategies might students employ? • How do the assessment items add to my understanding of the mathematics this module develops?
Review the Module Assessment Sample Solutions.	• Do any of the sample solutions surprise me? • What insight can I gain from the rationale provided for multiple choice distractors?
Review the Module Assessment Scoring Guide.	• Which items assess proficiency? Partial proficiency?

Study a Topic

Within a module, small groups of related lessons are organized into topics. Plan by topic. Use the following guide to help you review the whole topic.

Preview the Learning

Topic Resource	Guiding Questions
Read the Topic Overview to understand the scope of the topic.	• What big ideas does the topic teach? • What strategies, models, and language will students use? • Are there any optional lessons? How do these lessons relate to the major learning of the topic or module? • What information is new to me? • In what ways does this information change the way I'm thinking about the content, sequence, models, strategies, and language in this topic?
Read the Family Math found in the student *Apply* book.	• How does this foreshadow learning for students and communicate big ideas to students and their families?

Investigate the Development of Learning

Topic Resource	Guiding Questions
Review the Progression of Lessons to get a sense of how the learning develops.	• What will students learn in each lesson? • How do the lessons relate to one another? • How do strategies and models evolve through the topic?
Complete the Exit Ticket for each lesson of the topic.	• How does each Exit Ticket assess the learning in its lesson? • How does the sequence of Exit Tickets align with the sequence of the topic?

Explore the Assessment

Topic Resource	Guiding Questions
Complete the Topic Quiz to understand how students will be assessed on their learning.	• How does the Topic Quiz assess the learning in this topic? • How do the models, strategies, and language of the module appear in this assessment? • How does the content on the Exit Tickets relate to content on the Topic Quiz? • What variety of strategies might students employ? • How do the assessment items add to my understanding of the mathematics this topic develops?
Review the Topic Quiz Sample Solutions.	• Do any of the sample solutions surprise me? • What insight can I gain from the rationale provided for multiple choice distractors?
Review the Topic Quiz Scoring Guide.	• Which items assess proficiency? Partial proficiency?

Study a Lesson

Read the lesson, considering the flow of the lesson components and the student experience. Do the math to gain insight into the complexities within a sequence of problems and consider the thought processes and tools that students will have available.

Preview the Learning

Lesson Resource	Guiding Questions
Read the Lesson Overview: • Lesson Objective • Lesson at a Glance • Key Question(s) • Achievement Descriptor(s) • Exit Ticket	• What will students do during the lesson? • What big ideas, understandings, or skills will students have by the end of the lesson? • How is this reflected in the Exit Ticket?

Investigate the Development of Learning

Lesson Resource	Guiding Questions
Read the lesson: Fluency.	• What is the purpose of the Fluency? • Does the Fluency offer distributed practice, or does it build toward the current lesson through language, models, and strategies? • Given my students' strengths and areas of need, what modifications might I make to support different populations? • Which activities will benefit students most when used directly before the rest of the lesson? Which activities might I use at another time of day?
Read the lesson: Launch.	• What is the purpose of the Launch? • How will I capitalize on the Launch to activate student thinking, pique student interest, and establish a purpose for today's learning?
Read the lesson: Learn.	• How do the Learn segments build? • What instructional routines or facilitation suggestions support student engagement? • Where are opportunities for students to share their thinking and for me to facilitate various forms of discussion? Where is dedicated time and space for making connections? • Which parts of the lesson might my students find difficult? How will I support students during these parts? • How will I challenge students who demonstrate proficiency? • Where do I anticipate intentionally engaging students in the Standards for Mathematical Practice? • Which questions, phrasing, or terminology will I use from the sample dialogue to support coherence or precision? • Which ideas from the notes in the margin do I expect to use? • Which facilitation suggestions will I customize to meet the needs of my students?

Lesson Resource	Guiding Questions
Read the lesson: Land.	• What takeaways do I plan to make clear during the Debrief? • What terminology do I expect students to use? How will I support them in using it? • How will I support a range of reading abilities in my class? • What misconceptions do I anticipate, and how will I guide students if those misconceptions arise? • How might I assess student learning during the Debrief?
Do the math: Fluency, Classwork, Problem Set, Exit Ticket, Practice.	• What are the ways I anticipate my students might complete the tasks and answer the questions? • What questions assess student thinking? What questions advance student thinking? • Which problems on the Problem Set will I ask students to complete? • How will I customize the Problem Set to ensure that all students experience a simple-to-complex progression? • What errors or misconceptions do I anticipate? • Will there be barriers as students interact with text? How might I reduce those barriers? • How will I provide all students an opportunity to demonstrate success on the Exit Ticket? • How much time do I want students to spend practicing outside of class? • Which problems will I assign to provide more practice with the day's lesson? • Which problems will I assign to maintain prior learning? • Does the Practice Partner provide sufficient support for the task I plan to assign? What other support might be necessary?
Explore: Slides	• What content is included on the slides? • Do the slides have interactive components? If so, how do they function? How will I plan on using them? • Are there any slides I should plan on pushing to student devices? • Do I plan to use all of these slides? Are there any slides I should hide?

Prepare for Instruction

Successful implementation requires you to stay keenly aware of your students as you honor the strategic guidance offered in the lessons as they are crafted. Difficulty with pacing at the lesson level tends to come about when teachers feel pressured to ask every question and engage with every problem presented in every lesson. Using the curriculum with fidelity means honoring the integrity of its structure and the intent of the guidance within lessons. The following recommendations will help you make strategic decisions as you prepare to teach with your students in mind.

Task	Guiding Questions
Anticipate, prioritize, and customize.	• Considering the suggestions provided in the margin boxes, the language of the lesson, and the needs of my students, how will I customize the lesson? • Considering both my allotted instructional time and the needs of my students, do I need to customize the lesson? • How much time will students spend on the Problem Set? Will students work independently or in pairs?
Prepare the environment.	• What tools or materials will I need for facilitating this lesson? Do I need to prepare sentence frames or an anchor chart in advance? • What tools or materials might my students need? How can I organize them to best facilitate engagement and learning? How will I encourage my students to appropriately select their own tools? • Do I need to make any adjustments to my room arrangement for this lesson either to capitalize on space in the room or to maximize student collaboration?