

JUNE 2017

Achievement Network



Kindra Clineff courtesy of Boston Collegiate Charter School

LDOE's Eureka Remediation Tools
Session for Teacher Leaders



ACHIEVEMENT NETWORK **Learning. Together.**

Warm Up

Objectives

- Use the vertical coherence of the standards to provide targeted, just-in-time support for below grade-level students.
- Align interventions to the rigor of the standards and plan to avoid common remediation pitfalls.
- Use the LDOE Eureka Remediation tools to collect and analyze student data and plan how and when to address identified gaps.

Agenda

- The Math Shifts
- Strong Eureka Planning Practices
- Lunch
- Collaborative Problem Solving
- Important Mindsets for Supporting Struggling Students
- Using the tools
- Closing

Introduction: The Shifts

“

The standards were created to ensure that all students graduate from high school with the skills and knowledge necessary to succeed in college, career, and life, regardless of where they live.

”

- WWW.CORESTANDARDS.ORG

The 3 Math Shifts



1. **Focus:** *Focus* strongly where the Standards focus.



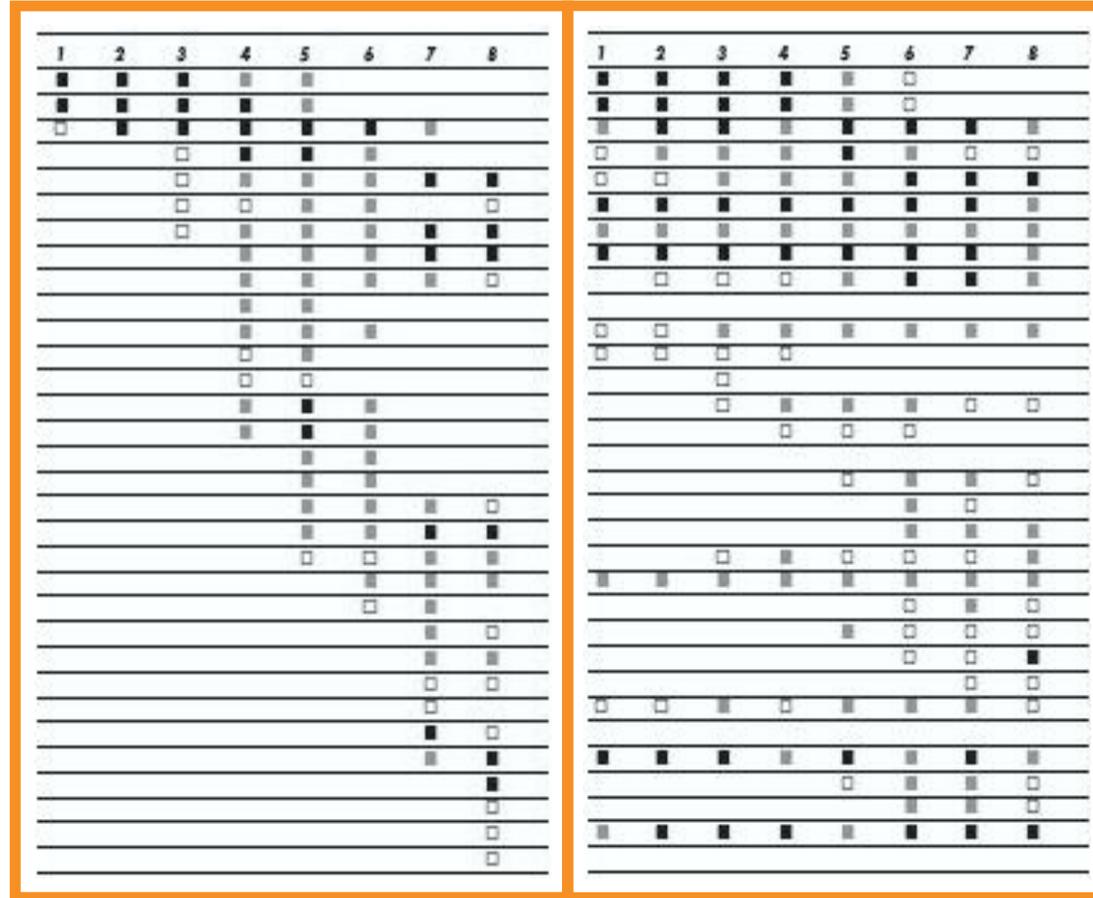
2. **Coherence:** *Think* across grades, and *link* to major topics within grades.



3. **Rigor:** In major topics, pursue conceptual *understanding*, procedural skill and *fluency*, and *application*.

Problem #1: The old standards were a “mile wide and an inch deep.”

Mathematics topics intended at each grade by at least two-thirds of A+ countries



Mathematics topics intended at each grade in many U.S. state standards.

¹ Schmidt, Houang, & Cogan, “A Coherent Curriculum: The Case of Mathematics.” (2002).

Solution #1: Focus

- Significantly narrow the scope of content
- Focus deeply on what is emphasized in the standards

Teach less

Learn more



Key areas of focus in Mathematics

GRADE	FOCUS AREA
K-2	
3-5	
6	
7	
8	

Eureka supports focus

GRADE	FOCUS AREA
6	Ratios and proportional reasoning; early expressions and equations

Grade 6	
20 days	M1: Ratios and Unit Rates (35 days)
20 days	
20 days	M2: Arithmetic Operations Including Dividing by a Fraction (25 days)
20 days	M3: Rational Numbers (25 days)
20 days	M4: Expressions and Equations (45 days)
20 days	
20 days	
20 days	M5: Area, Surface Area, and Volume Problems (25 days)
20 days	M6: Statistics (25 days)

Problem #2: Math doesn't make sense when skills are fragmented, taught in isolation, or as a checklist.

- Multiplication
- Fractions
- Area/Perimeter
- Equations
- Probability

Solution #2: Coherence

5.NBT.A.1: Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and $\frac{1}{10}$ of what it represents in the place to its left.

5.NBT.B.5: Fluently multiply multi-digit whole numbers using the standard algorithm.



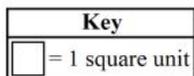
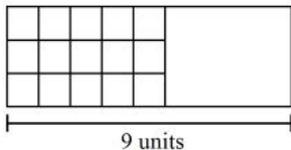
5.NBT.B.7: Add, subtract, multiply, and divide decimals to hundredths, using...strategies based on place value...and explain the reasoning used.

Solution #2: Coherence

- How does the 7th grade **item** build on skills/concepts from earlier grades?
- How do you see these **standards** building on each other toward the 7th-grade understanding?

3rd Grade

Which expression represents the total area, in square units, of the rectangular figure below?



- A. $3 \times 4 \times 5$
- B. $3 \times 5 \times 9$
- C. $(3 \times 5) + (3 \times 4)$
- D. $(3 \times 5) \times (3 \times 4)$

3.MD.C.7c: Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the **distributive property** in mathematical reasoning.

6th Grade

Use the drop-down menus below to make an equivalent expression.

$$6x + 15y = \text{3} (\text{2} x + \text{5} y)$$

6.EE.A.3: Apply the **properties of operations** to generate equivalent expressions. [...]

7th Grade

Which expressions are equivalent to the expression below?

$$m(n + p + 6)$$

Select **all** that apply.

- A. $mn + p + 6$
- B. $-m(n - p - 6)$
- C. $mn + m(p + 6)$
- D. $mn + mp + 6m$
- E. $m + (n + p + 6)$
- F. $-m(-n - p) + 6m$

7.EE.A.1: Apply **properties of operations** as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

Across grade coherence

4.NBT.B.4:

Add and subtract whole numbers with the standard algorithm.



5.NBT.B.7:

Add, subtract, multiply, and divide decimals to hundredths, using...strategies based on place value...and explain the reasoning used.



6.NS.B.3:

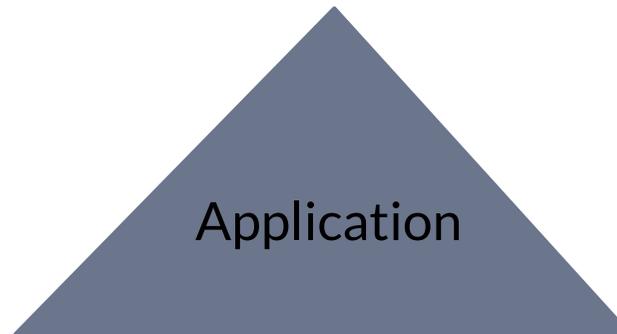
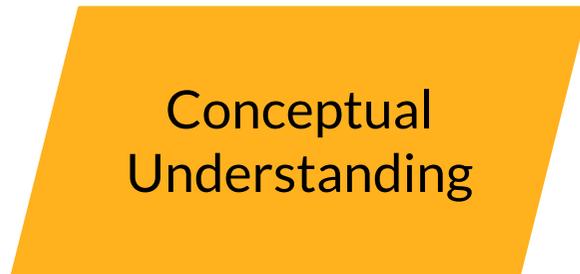
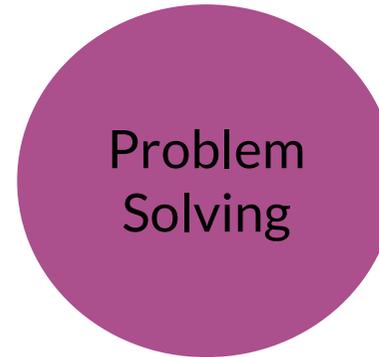
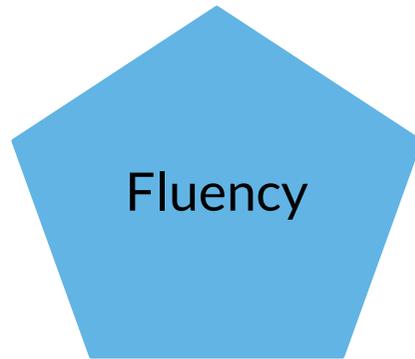
Compute with decimals.

Eureka supports coherence

	Grade 6
20 days	M1: Ratios and Unit Rates (35 days)
20 days	
20 days	M2: Arithmetic Operations Including Dividing by a Fraction (25 days)
20 days	M3: Rational Numbers (25 days)

20 days	M4: Expressions and Equations (45 days)
20 days	
20 days	
20 days	M5: Area, Surface Area, and Volume Problems (25 days)
20 days	M6: Statistics (25 days)
20 days	

Problem #3: Many math programs emphasized only *one* of these



Solution #3: Rigor



Stool analogy courtesy of Student Achievement Partners.

Eureka supports rigor

$$23 \times 32$$

$$\begin{array}{r} 30 \\ + \\ 1 \end{array}$$

Suggested Lesson Structure

Fluency Practice	(10 minutes)
Concept Development	(25 minutes)
Application Problem	(15 minutes)
Student Debrief	(10 minutes)
Total Time	(60 minutes)



Above is the suggested lesson structure for Grade 2 Module 1 Lesson 5.

Eureka supports the math shifts



1. **Focus:** *Focus* strongly where the Standards focus.



2. **Coherence:** *Think* across grades, and *link* to major topics within grades.



3. **Rigor:** In major topics, pursue conceptual *understanding*, procedural skill and *fluency*, and *application*.

The “what” of vertical coherence

Teachers **understand** that math is made up of progressions--that foundational concepts get extended across grade levels. They **recognize** that the content of their grade-level connects to the content of the previous and upcoming grades.

3.MD.C.7a

Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.

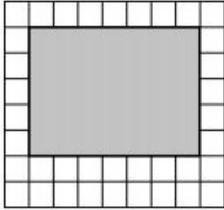
5.NF.B.4b

Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths...

The “so what” of vertical coherence

Teachers use these connections to scaffold instruction. They frame new skills as extensions of established knowledge.

In the figure below, each square represents one unit.



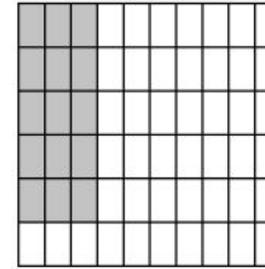
Which expression can be used to find the area of the shaded rectangle, in square units?

- A. 5×7
- B. $5 + 7$
- C. 6×8
- D. $10 + 14$

3.MD.C.7a

Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.

Which equation could be used to find the area, in square yards, of the shaded part of the figure below?



- A. $\frac{3}{15} \times \frac{5}{15} = ?$
- B. $\frac{3}{10} \times \frac{5}{6} = ?$
- C. $\frac{10}{15} \times \frac{6}{15} = ?$
- D. $\frac{7}{10} \times \frac{1}{6} = ?$

5.NF.B.4b

Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths...

Using vertical coherence to fill gaps

1. Solve the task.
2. What skills and knowledge are necessary for students to be successful on this task? Which previous grade level standards are connected to this concept?
3. What might you do to support students on this task?

<http://achievethecore.org/coherence-map/>

Solution

Reflect

What information from this introduction do you want to take back to the other teachers at your school?

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Strong Eureka Planning Practices

Planning Stages

- 1 Annual Curriculum Overview & Planning
- 2 Module Internalization
- 3 Daily Lesson Planning

Calendaring of the Modules can be supported by LDOE's Guide to Implementing Eureka

Calendar Pacing Exercise

- You're a 6th grade teacher.
- It's Sept. 23 and you just finished Module 1 (took way longer than planned).
- You're scheduled to give the first district-wide quarterly benchmark assessment on Oct. 4. It covers through Module 2, Topic A.
- The 2nd quarter benchmark is on Nov. 15 and covers the rest of Module 2 and all of Module 3.
- School's closed for Fall Break Oct. 13-14.

Use the LDOE Guide to Implementing Eureka to inform your decision making about which lessons/standards should be taught each week.

Planning Stages

1

Annual Curriculum
Overview & Planning

2

Module
Internalization

3

Daily Lesson
Planning

Module Internalization strategies:

- Research and study the standards
- “Take & tag” the End of Module Assessment

Module Internalization: Getting to Know Grade 7, Module 3

1. Research and study standard 7.EE.A.1 using the Louisiana Student Standards Companion Documents
2. Take and tag the excerpt of Grade 7, End of Module 3 Assessment (complete #1-2 and indicate which standard or part of a standard each item aligns to).

Planning Stages

1

Annual Curriculum
Overview & Planning

2

Module
Internalization

3

Daily Lesson
Planning

- Identify and dig into the targeted standard(s)
- Annotate the lesson, working every problem to get clear on desired understandings, potential modifications, and facilitation moves.
- Determine remediation needs and approaches to support students who miss the exit ticket items.

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Before we eat lunch...

Using a post it note, vote for the challenge you want to discuss after lunch.

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Collaborative Problem Solving

Collaborative Problem Solving

- Sit at a table with a challenge you'd like to discuss
- Try to sit with people you don't know

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Important Mindsets for Supporting Struggling Students

Discussion Questions

- A. When and how does math remediation/intervention happen at your school?
- B. What is working well and what is not?
- C. How is instruction for below-grade-level students different from instruction for students who are on or above grade-level?

Dangerous Mindset No. 1

My students are really far behind in math and there's no time to teach them the math conceptually. I have to show students the quickest, easiest way to get the right answer so that they can catch up.

Vertical Progression in the NBT Standards

Please look at this document.

- A. *What do you notice about how the standards progress across grades?*
- B. *What implications does this have for remediation/intervention?*

You are suggesting

Addition/Subtraction of Whole Numbers - Standards progression

KEY: Conceptual Standard Conceptual/Procedural Standard Procedural Standard

4			Fluently add multi-digit whole numbers using the standard algorithm. (4.NBT.B.4)	Fluently subtract multi-digit whole numbers using the standard algorithm. (4.NBT.B.4)
3			Fluently add within 1000 using strategies and algorithms based on place value, properties, and relationships. (3.NBT.A.2)	Fluently subtract within 1000 using strategies and algorithms based on place value, properties, and relationships. (3.NBT.A.2)
2	Fluently add within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. (2.NBT.B.5)	Fluently subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. (2.NBT.B.5)	Add w/in 1000 using concrete or visual models and other strategies (2.NBT.B.7)	Subtract w/in 1000 using concrete or visual models and other strategies (2.NBT.B.7)
			Explain why addition and subtraction strategies work, using place value and the properties of operation. (2.NBT.B.9)	Understand three-digit numbers are composed of hundreds, tens, and ones. (2.NBT.A.1)
1	Add within 100 using concrete or visual models properties, and relationships. (1.NBT.C.4)	Subtract multiples of 10 using concrete or visual models properties, and relationships. (1.NBT.C.6)		

Dangerous Mindset No. 1

My students are really far behind in math and there's no time to teach them the math conceptually. I have to show students the quickest, easiest way to get the right answer so that they can catch up.

What might you say to a colleague who displays this mindset?

Dangerous Mindset No. 2

My students don't know their math facts so they're not ready for on-grade-level standards. I have to get them caught up on the math facts first.

Agree or Disagree?

$$3 \times \frac{2}{7}$$

Students need to be solid with time tables before they can solve this problem

Note: This is a 4th grade problem.

Math Example: What We See in Classrooms

$$3 \times \frac{2}{7}$$

How would you solve this problem?

The Standard

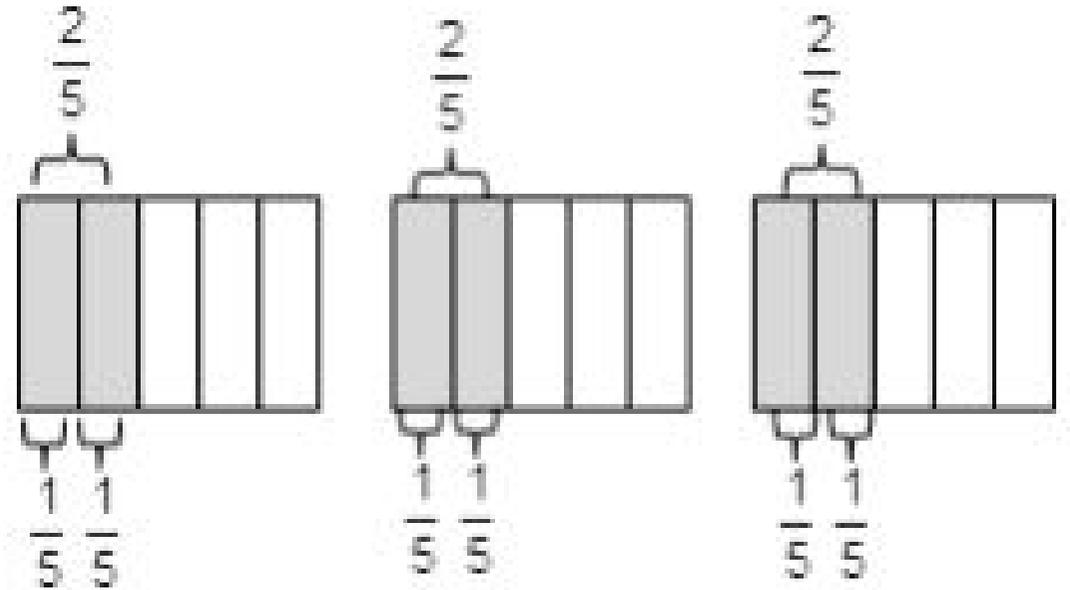
4.NF.B.4a— Understand Fractions as Multiples of Unit Fractions

Understand a fraction a/b as a multiple of $1/b$. For example, use a visual fraction model to represent $5/4$ as the product $5 \times (1/4)$, recording the conclusion by the equation $5/4 = 5 \times (1/4)$. (4.NF footnote: Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12 and 100.)

What It Should Look Like

Examples:

- $3 \times \frac{2}{5} = 6 \times \frac{1}{5} = \frac{6}{5}$



Dangerous Mindset No. 2

My students don't know their math facts so they're not ready for on-grade-level standards. I have to get them caught up on the math facts first.

What might you say to a colleague who displays this mindset?

The Core Actions from SAP

Please look at this document,
“Summary of Core Actions.”

- A. *Do you see these indicators more often in gifted, standard, or remedial classes?*
- B. *With which indicators do you see the biggest difference?*

MATH SUBJECT	K-8 GRADES	LESSON GUIDE TYPE
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SUMMARY OF CORE ACTIONS

Core Action 1

Ensure the work of the lesson reflects the Shifts required by the CCSS for Mathematics.

Indicators

- A. The lesson focuses on the depth of grade-level cluster(s), grade-level content standard(s) or part(s) thereof.
- B. The lesson intentionally relates new concepts to students' prior skills and knowledge.
- C. The lesson intentionally targets the aspect(s) of rigor (conceptual understanding, procedural skill and fluency, application) called for by the standard(s) being addressed.

Core Action 2

Employ instructional practices that allow all students to master the content of the lesson.

Indicators

- A. The teacher makes the mathematics of the lesson explicit by using explanations, representations, and/or examples.
- B. The teacher provides opportunities for students to work with and practice grade-level problems and exercises.
- C. The teacher strengthens all students' understanding of the content by sharing a variety of students' representations and solution methods.
- D. The teacher deliberately checks for understanding throughout the lesson and adapts the lesson according to student understanding.
- E. The teacher summarizes the mathematics with references to student work and discussion in order to reinforce the focus of the lesson.

Core Action 3

Provide all students with opportunities to exhibit mathematical practices in connection with the content of the lesson.

Indicators

- A. The teacher poses high-quality questions and problems that prompt students to share their developing thinking about the content of the lesson.

Students share their developing thinking about the content of the lesson.

Page 1 / 1

Dangerous Mindset No. 3

Having students discuss in small groups , struggle though challenging problems, or look at different solution methods is great for students who are on or above grade level. My students, who are below grade level, need more direct instruction and lots of repetition in their lessons.

Classroom Video

Which indicators of the Core Actions do you see in [this lesson](#)?

This is a 5th grade class with a large ELL population..

Dangerous Mindset No. 3

Having students discuss in small groups , struggle though challenging problems, or look at different solution methods is great for students who are on or above grade level. My students, who are below grade level, need more direct instruction and lots of repetition in their lessons.

What might you say to a colleague who displays this mindset?

1. Teaching procedures without building conceptual understanding flies in the face of the standards and does not help below-grade-level students.
2. Often, students do not need to master “math facts” before learning standards on their grade level. Closely analyzing the standards is the only way to find out.
3. All students are capable of and benefit from rigorous and engaging instruction, including students who are low in math.

Key Messages

Agenda

- The Math Shifts
- Strong Eureka Planning Practices
- Lunch
- Collaborative Problem Solving
- Important Mindsets for Supporting Struggling Students
- Using the tools
- Closing

Using the Tools

A New Resource from LDOE: Eureka Remediation Tools

- Available for prioritized topics in Grades 4-8 and Algebra I
- Include 3 diagnostic questions for prior grade level standards that are prerequisites for new content
- Point teachers to portions of prior grade level Eureka lessons that can be used to target the gaps that are revealed
- Can be used within core math class, intervention time, or a combination

Common Missteps in Math Remediation

Misstep	Recommendation
Halt instruction for a blanket review of all gaps	Prioritize upcoming content and what is most essential prerequisite knowledge, skills and understanding Provide 'just in time' support within each instructional unit or during intervention
Teach all standards in a procedural way	Consider the aspect of rigor when choosing tasks and strategies, especially when gaps are due to a lack of conceptual understanding
Disconnect intervention from core math content	Connect learning experiences and relate instruction to a relevant grade-level context

Recommended Approach

Diagnose



Understand



Take Action

- Embed diagnostic questions in instruction/assessment prior to starting the new module/topic
- Determine what gaps exist and whether they are for the whole class or a small group

- Study how the prerequisite standard relates to the new content
- Understand whether the gap can be addressed alongside upcoming material or if it must come before

- Whole class needs: plan to build needed scaffolds into upcoming lessons. If needed, adjust pacing calendar to add in additional lessons
- Small group needs: plan differentiated instruction or coordinate to address gaps within intervention periods

Practice - Use Within RTI

Analyzing Student Work from Diagnostic Questions

Read the “Diagnostic Assessment” section on page 2 of the Grade 5, Module 1 - Topic A Remediation Guide.

Review the sample student work to determine where gaps exist (which standards?).

Understand the Standard & How it Connects to Upcoming Material

For 4.NBT.A.1:

- What component of rigor is addressed by this standard?
- How does that knowledge/skill connect to the 5th grade content in Module 1 - Topic A - Lesson 2?

Take Action

- Identify which prior grade lessons should be used and with which students

Practice - Whole Class

Diagnose & Understand

- The Math team at a school in Chicago worked alongside their ANet coach to create a diagnostic they administered to their 6th grade class prior to starting Module 4 of Eureka. They assessed prior grade level standards that are prerequisites for the 6.EE domain.
- Review the diagnostic and student results analysis spreadsheet they created. **What can you discern about the process this team used to diagnose their students?**

Take Action

- Address minor gaps by adding scaffolding and additional supports into the lessons
- Address major gaps:
 - For a majority of students: by adjusting your pacing calendar to insert 1-2 prerequisite lessons
 - For a specific group of students: by leveraging intervention or small group time

Reflections on the Chicago Approach



Applying Lessons Learned to the LDOE Tools

- What parts of the Chicago project are “done for us” by LDOE?
- Therefore...

What are the key actions needed to support students who may not be prepared to engage in the grade-level content of all Eureka lessons?

Practice - Building Scaffolds into Lessons

Practice: Building scaffolds into lessons

1. Do the Math
2. Identify existing supports
3. Add additional supports

Do the Math

Solve the lesson problems as a student would.

Discuss: where do you anticipate that students would struggle?

Identify existing supports

With your table, identify the supports already built into the lesson.

Add additional supports

With your table, identify additional supports that could be added to the lesson.

4th grade annotated example

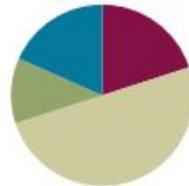
*Green text: existing supports
*Blue text: additional supports

Lesson 11

Objective: Use place value understanding to fluently add multi-digit whole numbers using the standard addition algorithm, and apply the algorithm to solve word problems using tape diagrams.

Suggested Lesson Structure

■ Fluency Practice	(12 minutes)
■ Application Problem	(7 minutes)
■ Concept Development	(30 minutes)
■ Student Debrief	(11 minutes)
Total Time	(60 minutes)



STANDARDS ALIGNMENT:

- 4.NBT.B.4: Add and subtract whole numbers with the standard algorithm.
- 4.OA.A.3: Solve multi-step word problems involving whole numbers.

ANTICIPATED AREAS OF STRUGGLE:

- Place value understanding; ability to compose/decompose numbers
- Representing numbers with place value disks and bundle
- Fluency with adding multi-digit numbers

Fluency Practice (12 minutes)

- Round to Different Place Values **4.NBT.3** (5 minutes)
- Multiply by 10 **3.NBT.3** (4 minutes)
- Add Common Units **3.NBT.2** (3 minutes)

Skim the annotated lesson, and discuss at your table:

- What do you notice about this teacher's approach?
- What other opportunities do you see to increase accessibility?

Recap

Diagnose



Understand



Take Action

- Embed diagnostic questions in instruction/assessment prior to starting the new module/topic
- Determine what gaps exist and whether they are for the whole class or a small group

- Study how the prerequisite standard relates to the new content
- Understand whether the gap can be addressed alongside upcoming material or if it must come before

- Whole class needs: plan to build needed scaffolds into upcoming lessons. If needed, adjust pacing calendar to add in additional lessons
- Small group needs: plan differentiated instruction or coordinate to address gaps within intervention periods

Reflect

What are the key actions needed to support students who may not be prepared to engage in the grade-level content of all Eureka lessons?

Plan: Communication rhythms

Math Communication Structures

	Additional information	Your Notes
Who?	<i>Who is involved in math instruction for the grade level?</i> May include: other grade level teachers (if self-contained), SPED teacher, interventionists, paras, etc.	List the names here:
What?	What information does each party need to know? May include: pacing calendar updates, prior grade level skills that need to be reinforced or the actual math content and strategies. 	
When?	When will you meet in person? How often? What communication will happen electronically?	

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Closing

Reflection & Planning

- Plan how you will personally use the Eureka Remediation Tools
- Plan how you will be a leader across your school
- Plan how you will connect to the bigger picture

Follow-Up Webinars

We look forward to re-connecting this fall! These webinars will be an opportunity to share successes and solve challenges that arise as the Eureka Remediation Tools are implemented in classrooms across the state.

Dates/Communication:

Contact Us: Julia Davis - jdavis@achievementnetwork.org

www.achievementnetwork.org