Teacher Training on the Revised Math Standards

Math 6–8

Welcome

Agenda: Day 2

Time	Content
8–11:15	Part 4: Assessment & Instructional Materials • M7: Connecting Standards and Assessment
11:15–12:30	Lunch (on your own)
12:30–4	• M8: Evaluating Instructional Materials Part 5: Putting it All Together • M9: Instructional Planning

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Norms

- Keep students at the center
- Be present and engaged
- Be reflective and solutions oriented
- Challenge ideas with respect
- Monitor airtime

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Today's Goals

- Discuss the role assessment plays in the integrated system of learning.
- Discuss the cycle of assessment.
- Discuss the four areas of focus for standards-aligned assessments.
  - Review and create Math assessment items
- Develop a process for evaluating instructional materials.
- Connect standards and assessment through instructional planning.

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Key Ideas

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Key Ideas

Strong Standards

Standards are the bricks that should be masterfully laid through quality instruction to ensure that all students reach the expectation of the standards.

High expectations

We have a continued goal to prepare students to be college and career ready.

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Key Ideas

Instructional Shifts

The instructional shifts are an essential component of the standards and provide guidance for how the standards should be taught and implemented.

Aligned Materials and Assessments

Educators play a key role in ensuring that our standards, classroom instructional materials, and assessments are aligned.

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Part 4: Aligned Materials and Assessment

Key Idea

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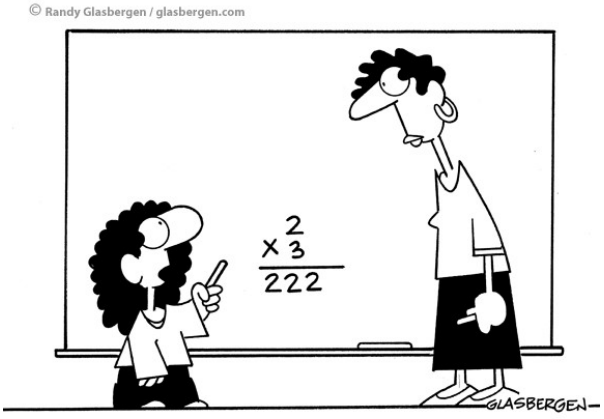
Assessing Student Understanding: Grades 6–8 Mathematics

Think About it…



"What do you mean, it's the wrong kind of right?"

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Goals

- Discuss the role assessment plays in the integrated system of learning.
- Discuss the cycle of assessment.
- Discuss the four areas of focus for standards-aligned assessments.
  - Review and write mathematics assessment items

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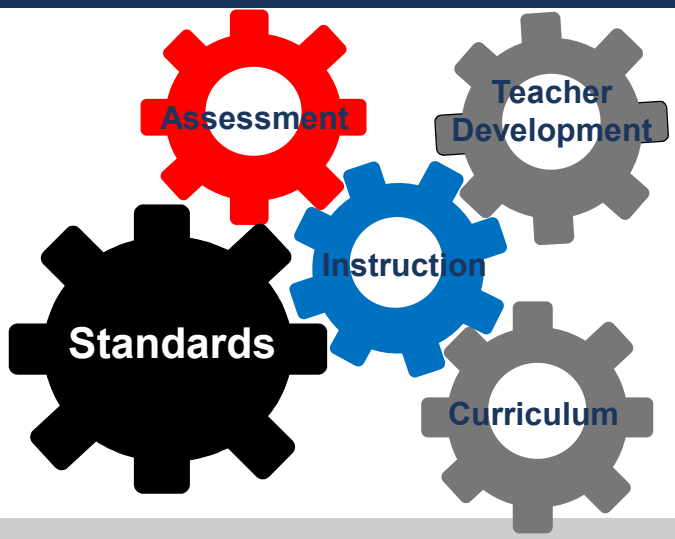
Connecting Standards and Assessment



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Defining Assessment

- Assessment is the action or an instance of making a judgment about something.

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Turn & Talk

- Considering this definition of assessment, what are educators “making a judgement about” when assessing students?

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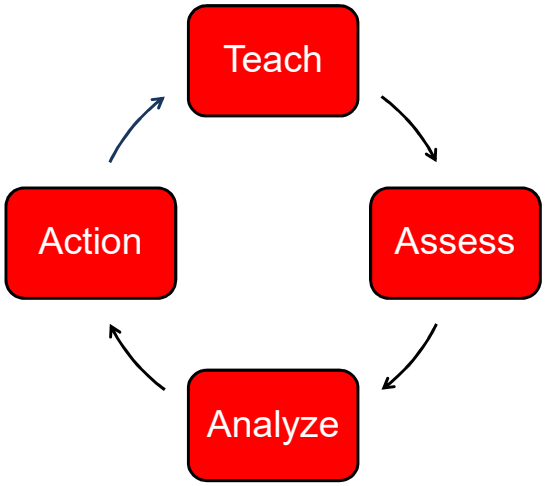
The Cycle of Assessment



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Think About It…

"The good news is that research has shown for years that **consistently applying** principles of assessment for learning has yielded remarkable, if not unprecedented, gains in student achievement, especially for low achievers."

—Black & Wiliam, 1998

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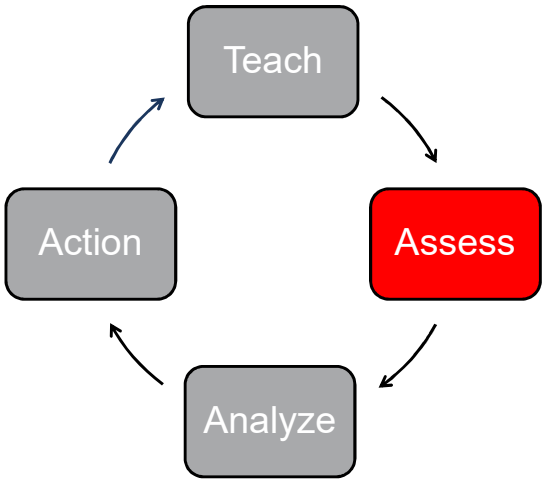
Assessment

The Cycle of Assessment



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Standards Aligned Assessments

Areas of Focus

1. Intent of the Assessment
   - Summative
   - Formative
2. Content and Structure of Assessments
3. Analysis of Assessments

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Formative vs Summative

How are the results used?

Formative	Summative

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Intent of Assessments

"Benchmark assessments, either purchased by the district or from commercial vendors or developed locally, are generally meant to measure progress toward state or district content standards and to predict performance on large-scale summative tests. A common misconception is that this level of assessment is automatically formative."

–Stephen and Jan Chappuis 2012

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Standards Aligned Assessments

Areas of Focus

1. Intent of the Assessment
   - Summative
   - Formative
2. Content and Structure of Assessments
3. Analysis of Assessments

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Quality Assessments

Universal Design Principles:

- No barriers
- Accessible for all students
- Upholds the expectations of our state standards

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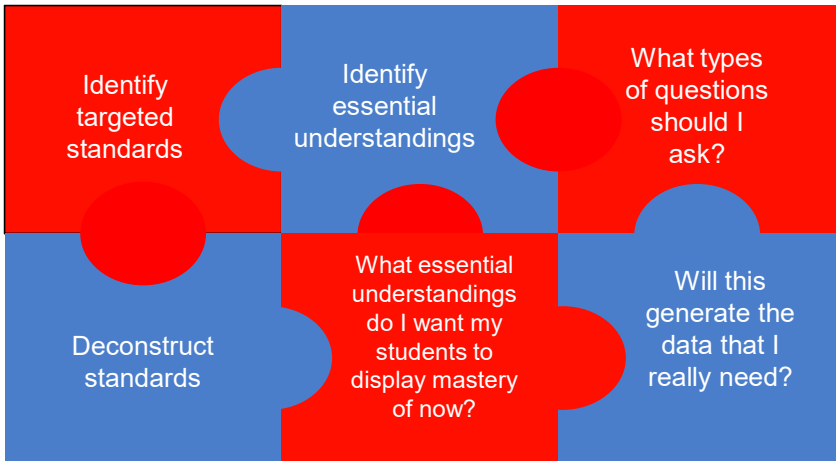
Developing a Classroom Assessment



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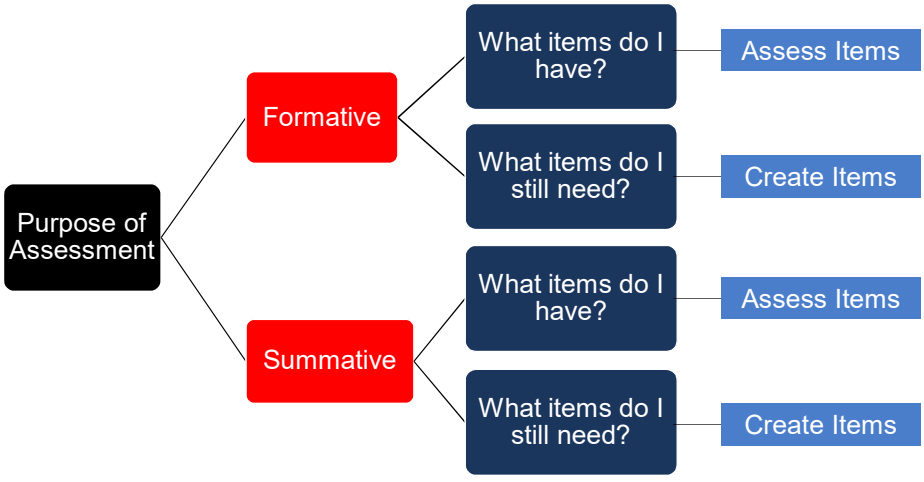
Inventory for Classroom Assessment



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Assessing an Item

Assessing an Item Activity-Math

Grade 4 Math:

Standard:

4.OA.A.3: Solve multi-step contextual problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

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Which Item Provides a Better Lens into Student Understanding?

Item 1: Samantha bought stickers.

- She bought 6 packs of stickers.
- Each pack has 12 stickers.
- She got 8 more stickers from a friend.

How many stickers does Samantha have in all?
A. 76
B. 78
C. 80
D. 82

Item 2: Samantha bought stickers.

- She bought 6 packs of stickers.
- Each pack has 12 stickers.
- She got 8 more stickers from a friend.

How many stickers does Samantha have in all?
A. 26
B. 64
C. 72
D. 80

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Which Item Provides a Better Lens into Student Understanding?

Item 1: Samantha bought stickers.

- She bought 6 packs of stickers.
- Each pack has 12 stickers.
- She got 8 more stickers from a friend.

How many stickers does Samantha have in all?
A. 76
B. 78
C. 80-Correct Answer
D. 82

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Which Item Provides a Better Lens into Student Understanding?

Item 2: Samantha bought stickers.

- She bought 6 packs of stickers.
- Each pack has 12 stickers.
- She got 8 more stickers from a friend.

How many stickers does Samantha have in all?

A. 26-Student adds the 3 numbers in the problem together
B. 64-Student multiplies 6 and 12 and subtracts 8
C. 72-Student Multiplies 6 and 12 but forgets to add 8
D. 80-Correct Answer

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Assessment Terminology

Item Type

- Selected response
- Open response
- Verbal
- Extended writing

Item Components

- **Stimulus** – the passage(s)
- **Stem –** the question that is asked
- **Key –** the correct answer
- **Distractor –** an incorrect answer
- **Rationale –** the reason an answer is correct or incorrect

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Examining Items: Formative vs Summative

What is the question actually asking?	Is the question aligned to the depth of the standard?	Are the answers precise?
Is the wording grade appropriate?	Is the question aligned to the standard?	Do the distractors give insight into student thinking?
Is the entire standard assessed?	Is the question precise?	Is there a better way to assess the standard?

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Item Assessment Activity

You will look at five assessment items. For each provided item, think about the things we just discussed. Decide if you would keep the item, revise the item in some way, or choose to exclude it when building a classroom assessment.

Look first at the items independently. Then you may work with a partner to complete the activity.

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6.SP.A.2

Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center (mean, median, mode), spread (range), and overall shape.

A student makes a 65, 75, 84, 92, and 74 on his math tests. Match the statistical description on the left with the correct calculation on the top.

	78	75	None	27
Mean				
Median				
Mode				
Range				

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8.F.A.3

Know and interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear.

Which of the following is not a linear function?

A. $3x + 4y = 12$
B. $y = |x|$ for all values where $x > 0$
C. $y = 2x + 3$
D. $y^2 = x$

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7.EE.B.4

Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

Mrs. Jones is buying paper for the copier. The paper costs $64 per box plus 6% sales tax.

Choose the two equations that could be used to represent the total cost C of b boxes of paper.

A. C = 64b + 0.06
B. C = 64b + 6
C. C = 64b(0.06) + 64b
D. C= 64b
E. C = [64 + 64(0.06)]b

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6.G.A.2

Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Know and apply the formulas *V* = lwh and *V = Bh where B is the area of the base* to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

The bakery sells biscuits to a restaurant in a rectangular prism-shaped box. Each biscuit has a diameter of 1 ½ inches. One layer of the box is 8 biscuits by 12 biscuits. The box holds 4 layers of biscuits. Each biscuit is ¾ in tall. What is the volume, in inches, of the box?

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8.G.B.6

Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

What is the distance between (3,6) and (-1,2) ?

A. $2\sqrt{5}$
B. $4\sqrt{2}$
C. 32
D. $2\sqrt{2}$

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Turn & Talk

- Share one or two “ah-ha” moments from this activity with your table partners.

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10-Minute Break

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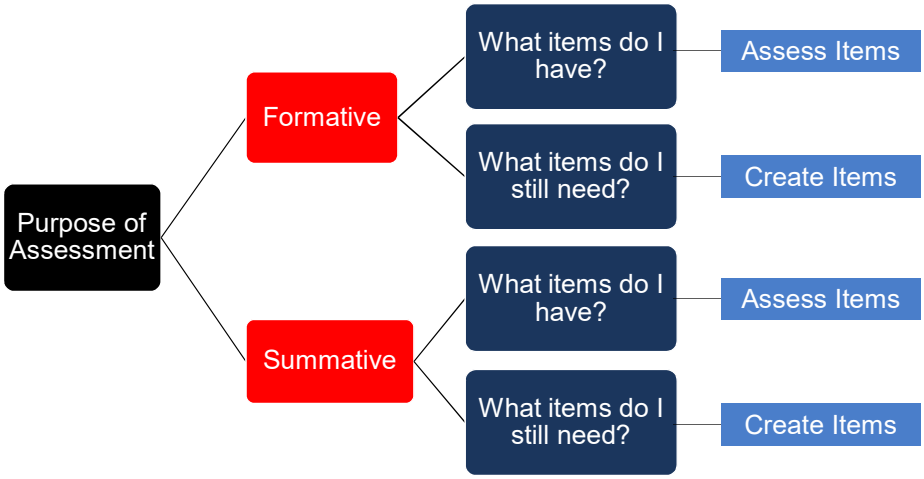
Creating Formative Items

Inventory for Classroom Assessment



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Item Writing-Formative Assessments

What is the question actually asking?	Across all items, are there questions aligned to the depth of the standard?	Are the answers precise?
Is the wording grade appropriate?	Is the question aligned to the standard?	Do the distractors give insight into student thinking?
Is the entire standard assessed in the suite of items?	Is the question precise?	Is there a better way to assess the standard?

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Standards-based

Before you actually start writing items:

- Think about the *purpose* of the assessment as a whole. Is it formative or summative?
- Read the standards carefully with the assessment purpose in mind. Ask yourself: "What skills/knowledge are the standards asking the student to display?"
- Revisit the "I can" statements or "essential questions" you wrote for the standard(s). They may provide guidance as you write items.
- Brainstorm.

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Revisiting Standard 6.RP.A.3a

6.RP.A.3 Use ratio and rate reasoning to solve real-world and mathematical problems (e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations).

a. Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

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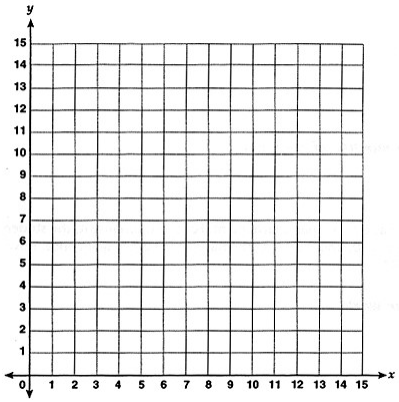
Formative Assessment

Graph the following points in the provided coordinate plane:

A. (2,5)
B. (0,3)
C. (4,0)
D. (9,8)
E. (0,0)



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Formative Assessment

Find missing values in unit rate tables.

Julie is making punch for a party. Her mom gives her the following table to show how much apple juice to mix with lemon lime soda.

Apple Juice (in gallons)	Lemon Lime Soda (in liters)
1	2
4	8

Select all of the ordered pairs that would have punch tasting the same as the recipe.

A . (2,4) C. (4,2) E. (3,9)

B. (2,3) D. (3,6) F. (7,14)

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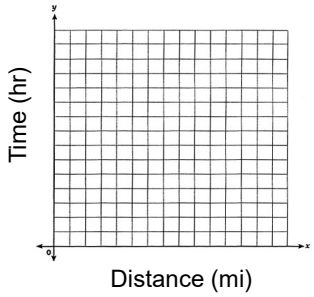
Formative Assessment

Plot pairs of values from a ratio table on a coordinate plane.

The following table shows how long it took Timmy's Dad to drive different distances. Graph them as ordered pairs on the provided coordinate grid.

Distance (in miles)	Time (in hours)
30	1
60	2
120	?
?	6



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Revisiting Standard 6.RP.A.3a

Did we cover all aspects of the standard with these items? Turn and talk to a neighbor.

6.RP.A.3 Use ratio and rate reasoning to solve real-world and mathematical problems (e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations).

a. Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

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Recap: Big Ideas

- Formative assessments *may* need items that scaffold in order for the teacher to diagnose what a student does/does not understand.
- Effectively writing "I can" or "Essential Questions" helps target assessment items specifically to standards.
- It is very difficult to formatively assess student understanding through a single item.
- It's important to ask yourself the 9 essential questions during item review or item writing.

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Quality Assessments

Universal Design Principles:

- No barriers
- Accessible for all students
- Upholds the expectations of our state standards

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Item Writing-Formative Assessments

What is the question actually asking?	Across all items, are there questions aligned to the depth of the standard?	Are the answers precise?
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Item Writing-Your Turn

- You will be provided a set of standards and two options for item writing.
- Once you have finished writing items, you will post them for our gallery walk.
  - Please post the coding for the standard(s) to which your items are written.
  - You do not have to post the rationales.
- You may work with a partner.

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Standards

- 6.RP.A.1
- 6.RP.A.2
- 7.RP.A.2
- 8.EE.B.5
- 8.EE.B.6

Selected Response

Multiple Choice	Multiple Select
Items typically have 4 answer options with 1 correct answer. It may be helpful to use the verb in standard. Most of the time the stem will be stated in a positive manner avoiding negatives. The item really should be written as a question, not a completion statement.	Students are typically asked to provide two or three correct answers to the question in the stem. Such items tend to enable students to demonstrate a full understanding of a concept, or solve problems in multiple ways. There are typically 2−3 correct answers and 5−6 answer options, depending on the grade level/standard being assessed.

Your Turn: Formative Item Writing

Option 1	Option 2
1. Choose 3 standards. 2. Write an item to assess each standard that you would use on a formative assessment. 3. Try to write at least one multiple choice or multiple select item. Focus on writing distractors that provide instructional information.	1. Choose 1 standard. 2. Write 3 formative assessment items to the single standard that you select. Make sure that each item requires students to demonstrate a different level of understanding of the standard. 3. Try to write at least one multiple choice or multiple select item. Focus on writing distractors that provide instructional information.

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Gallery Walk

As you look at/review your colleagues items, look for similarities and differences in the items created.

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Turn & Talk

Reflect on your experience writing assessment items and discuss:

- What was challenging about this experience?
- What did you learn from this experience?
- What supports do you need to better understand the relationship between standards and assessments in this way?

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Analyzing Assessments

Standards Aligned Assessments

Areas of Focus

1. Intent of the Assessment
   - Summative
   - Formative
2. Content and Structure of Assessments
3. Analysis of Assessments

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Analysis of Assessment

- Is the data from assessments being analyzed?
- How is it analyzed?
- On which questions did students perform well? Why?
- On which questions did students perform poorly? Why?
  - Were there issues with poorly written questions, questions not really aligned to standards, or multiple correct answers?

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Did You Know…

- In general on the grade 2 stand-alone field test students performed better on writing to literary text as opposed to informational text. Why?
- In general students struggled answering assessment items around quadratics in Algebra I. Why?
- Students demonstrated better understanding in Reading: Informational Text than Reading: Literature in English I. Why?

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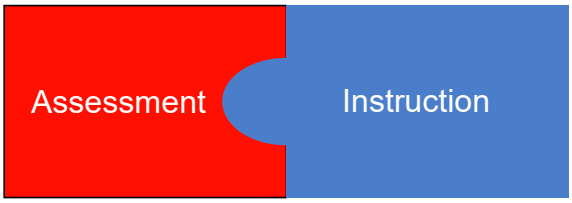
Taking Action

Action



- How is instruction changing/adapting as a result of student data?
- Are results shared with all stakeholders (including students)?
- Are assessments adapted to address weaknesses found?

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Think About It…

"The assessments will produce no formative benefit if teachers administer them, report the results, and then continue with instruction as previously planned."

—Stephen and Jan Chappuis, 2012

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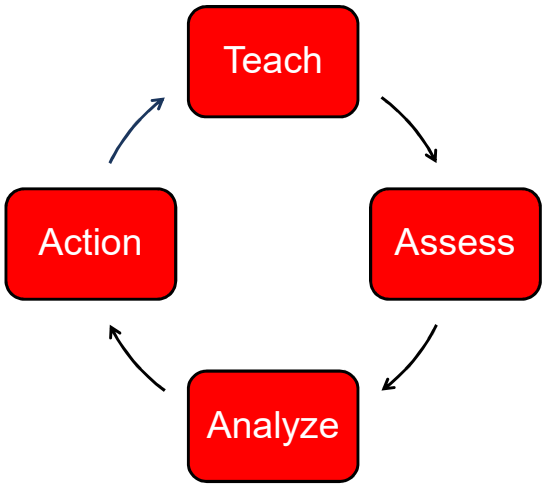
Summary

The Cycle of Assessment



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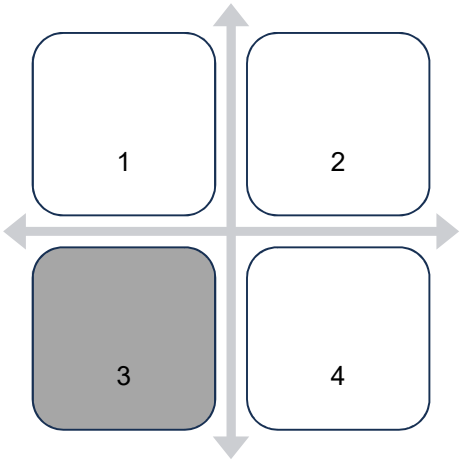
Appointment with Peers



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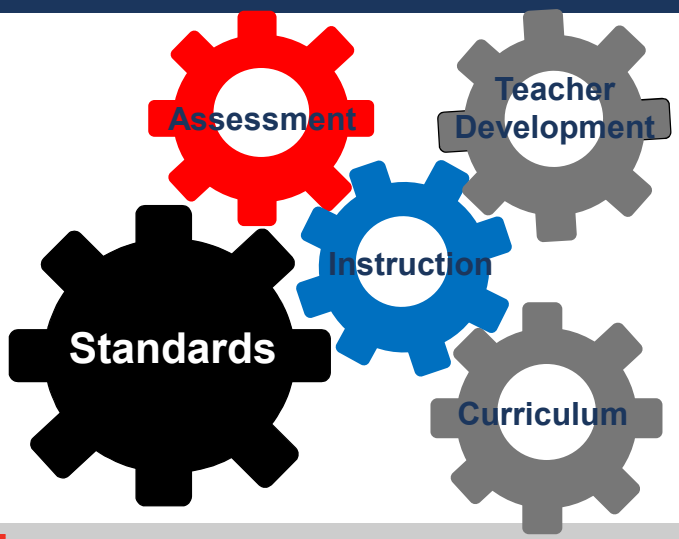
Connecting Standards and Assessment



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Lunch Break: 1 hour 15 minutes

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Please Sign In!

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Module 8: Evaluating Instructional Materials

Key Question

How do we know that our instructional materials address the depth of the content and the instructional shifts of focus, coherence, and rigor of the TN State Standards?

Goals

- Examine the TEAM rubric to define what is meant by standards based materials.
- Know which key criteria to use for reviewing materials, lessons, and/or units for alignment and quality.
- Understand how the review process of instructional materials will:
  - Deepen understanding of the standards,
  - Make use of screening instruments to analyze materials to determine alignment or gaps, and
  - Result in wise decisions about how best to use the materials already on-site to teach the new standards to mastery OR effectively fill any gaps uncovered in the review process.

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Standards-based Materials and Practice

Rationale

"…teachers have a responsibility to make day-to-day instructional choices that ensure that students work with problems that engage their interest and their intellect."

—*Smarter Than We Think*

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Reflect on our Practice

When your students' work is on public display, in the hallway or shared with families, can anyone see the math?

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Reflect on our Practice

In other words:

- Are the materials and the instructional practices you are using focusing on the mathematics?
- If anyone looked at your students' work, would they be able to see the math or would they be left asking "where's the math?"

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TEAM: Activities & Materials

- Support the lesson objective
- Are challenging
- Sustain students' attention
- Elicit a variety of thinking
- Provide time for reflection
- Provide opportunities for student-to-student interaction
- Provide students with choices
- Incorporate technology
- Induce curiosity & suspense
- In addition sometimes activities are…
  - Game-like
  - Involve simulations
  - Require creating products or
  - Demand self-direction and self-monitoring
- The preponderance of activities demand complex thinking and analysis
- Texts & task are appropriately complex

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TEAM: Problem Solving

- Abstraction
- Categorization
- Predicting Outcomes
- Improving Solutions
- Generating Ideas
- Creating & Designing
- Observing & Experimenting
- Drawing Conclusions/Justifying Solutions
- Identify Relevant/Irrelevant Information

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Effective Mathematics Teaching Practices

1. Establish mathematics goals to focus learning.
2. Implement tasks that promote reasoning and problem solving.
3. Use and connect mathematical representations.
4. Facilitate meaningful mathematical discourse.
5. Pose purposeful questions.
6. Build procedural fluency from conceptual understanding.
7. Support productive struggle in learning mathematics.
8. Elicit and use evidence of student thinking.

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Effective Mathematics Teaching Practices

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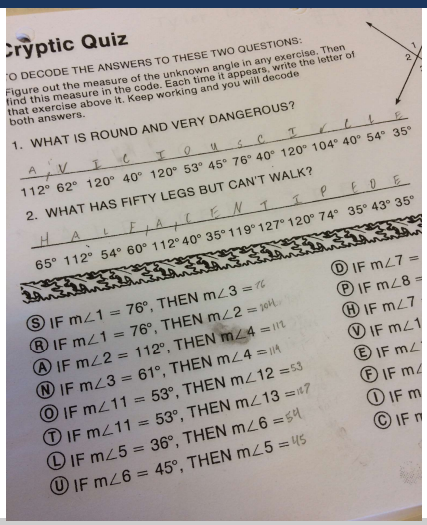
Missing Angle Activity



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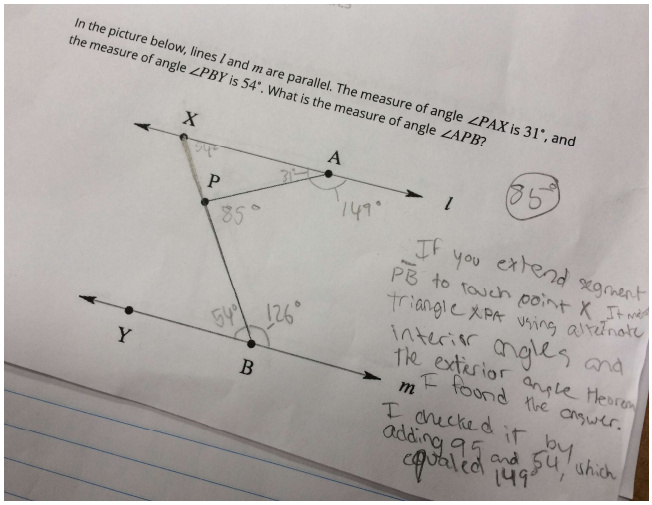
Missing Angle Activity-Angle Task



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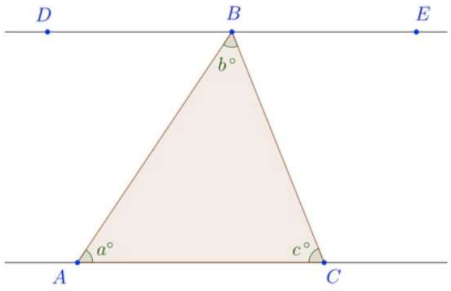
Analyze the Task

Task

Given that $\overleftrightarrow{DE} \parallel \overleftrightarrow{AC}$ in the diagram below, prove that $a + b + c = 180$.



Explain why this result holds for any triangle, not just the one displayed above.

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Missing Angle Activities

8.G.A.3. Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.

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Missing Angle Activities

8.G.A.3. **Use** **informal arguments** to **establish** **facts** about the **angle sum** and **exterior angle** of **triangles**, about the **angles** **created** when **parallel lines** are **cut** by a **transversal**, and the **angle-angle criterion** for **similarity** of **triangles**.

For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.

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Criteria for Alignment and Quality

Research

"A curriculum is more than a collection of activities."

–from the Curriculum Principle in Principles and Standards for School Mathematics

Research

A **well-articulated curriculum** will:

- Make clear the most important mathematics of the grade level.
- Specify when concepts and skills are introduced and when they should be mastered.
- Detail how student conceptual understanding of big ideas develops across units and across multiple grade levels.

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Identifying Effective Instructional Materials

- When choosing instructional materials, what should a teacher consider?
- Stop and jot some ideas.

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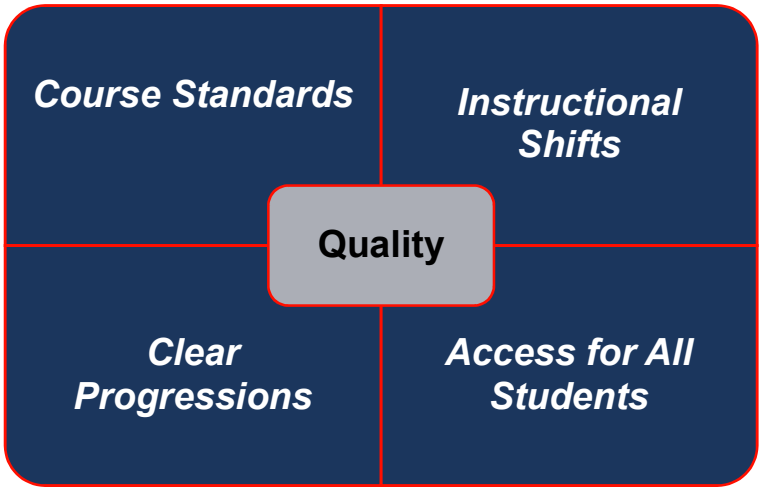
Key Criteria for Instructional Materials



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Key Criteria for Instructional Materials

- High-quality instructional materials are:
  - Aligned to the standards,
  - Connected to the content,
  - Show clear learning progressions, and
  - Are devoted to the major work of the grade/course standards (math).

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Let's Recap

- Our classroom practice and the resulting student work should always connect with all components of the Tennessee State Standards.
- Our use the high leverage teaching practices will promote the types of activities that will increase student achievement.
- Our use of specific key criteria for reviewing materials, lessons, and/or units for alignment and quality will ensure student access to the Tennessee State Mathematics Standards.

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Instructional Materials: Using a Review Process

Materials Review Instrument

- The screening instruments call for **100 percent alignment to the standards** for English language arts, math, science, and social studies.
- Once reviewers have a deep understanding of the standards, they should study the screening instrument.

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Materials Review Instrument

- **Section I: Non-negotiable Alignment Criteria**
  - **Part A: Standards**
  - **Part B: Shifts**
    - **Focus**
    - **Rigor**
    - **Coherence**

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Materials Review Instrument

- **Section I: Part A**
- The instructional materials represent **100 percent alignment** with the Tennessee Math Standards and explicitly focus teaching and learning on the course standards at the rigor necessary for students to reach mastery.

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Materials Review Instrument

- **Section I: Part B**
- Instructional Shifts
  - Focus
  - Rigor
  - Coherence

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Materials Review Instrument

Part B: Non-negotiable

Focus: Instruction centers on the course standards, standards for mathematical practice, and literacy skills for mathematical proficiency.

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Materials Review Instrument

- Materials focus on the course standards. Topics from future courses and/or earlier grades/courses are clearly identified as such in the materials, and do not detract from focus.
- Materials connect the standards for mathematical practice and literacy skills for mathematical proficiency to the content standards in meaningful and intentional ways. The development of the math practices and literacy skills is well-grounded in content and not isolated.

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Materials Review Instrument

- Materials include teacher-directed materials that explain the role of the standards for mathematical practice in the classroom and in students' mathematical development. Problems and activities present opportunities for students to make use of and exhibit the math practices as they work on content.
- Materials are mathematically accurate and course appropriate.

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Materials Review Instrument

Part B: Non-negotiable

Provides learning experiences that supports coherence across and within courses and grade levels.

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Materials Review Instrument

- Connections are made within a course between clusters and domains, where these connections are appropriate and natural, as set forth by the standards.
- Content progressions between this course and other mathematics courses reflect those seen in the standards. These progression connections are clearly indicated in the materials and enhance the required learning in the course. They are clearly aimed at helping students meet the standards as written.

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Materials Review Instrument

Part B: Non-negotiable

The three aspects of rigor are given full attention: conceptual understanding, procedural fluency, and application.

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Materials Review Instrument

- High-quality problems and questions designed to invite exploration and support conceptual understanding are included for content standards and clusters that explicitly call for it. A variety of conceptual problems enable students to connect mathematical ideas and representations and transfer understandings to new situations.
- Materials support the development of fluency and include opportunities to practice algebraic manipulation and computation, appropriately apply tools, and use technology. Sometimes problems are purely procedural; none are based on non-mathematical tricks or mnemonics.

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Materials Review Instrument

- Students are given opportunity to apply mathematical knowledge and skills for standards that set a clear expectation for modeling. A variety of course-appropriate problems provide students the opportunity to apply mathematical models in a variety of contextual situations using knowledge and skills articulated in the standards prior to or during the current course.

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Materials Review: Screening Instrument

Section two examines materials and screens for usability and accessibility. By examining this section, reviewers can determine if the materials reflect best practices and are accessible for ALL students.

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Materials Review Instrument

- **Section II: Additional Alignment Criteria and Indicators of Quality**
  - **Part A: Key areas of focus**
  - **Part B: Student engagement & instructional focus**
  - **Part C: Monitoring student progress**

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Best Practices

- While our standards have undergone mostly minor revisions, it's important to review instructional materials you use to determine where you have strong alignment to standards and where you may have gaps to fill.
- **School leaders and teachers should engage in reviewing instructional materials on an ongoing basis to develop pedagogy and capacity.**

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Teacher Materials Review Process

Teachers need to review materials when:

- There is a new adoption. (This occurs annually for different subjects at the local level.)
- Current materials have gaps that may require supplemental materials.
- They are looking for supplemental instructional materials.

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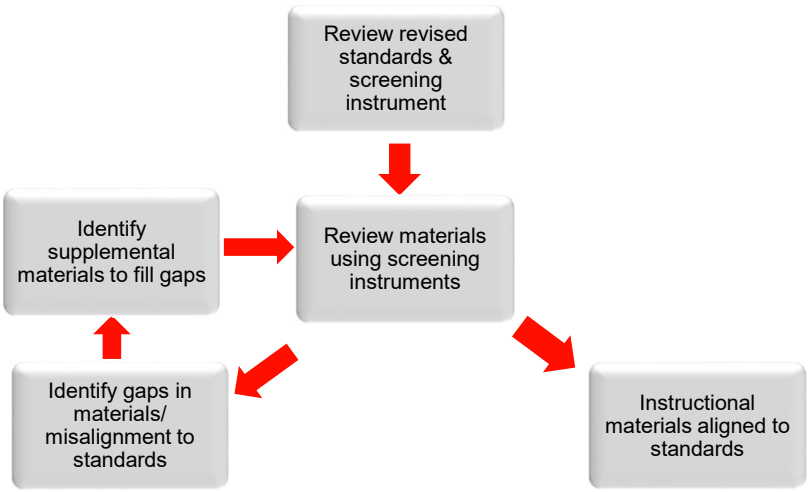
Teacher Materials Review Process



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Supplemental Materials

Let's discuss:

- What resources do you have on hand?
- Where do you find supplemental materials?
- How can you use this process to evaluate supplemental materials?

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Reviewing Materials: A Recap

As you look for materials…

1. Is it aligned to the standards?
2. Does it reflect high leverage best practices?
3. Is it accessible for ALL students?
4. Does it lead to students being able to demonstrate mastery of the standard?

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Think Back to Cryptic Quiz…

- Was it aligned to the course standards?
- Did it focus on major work of the grade?
- Could it be a part of coherent set of activities?
- What SMPs did it align to?
- Can the literacy skills be applied?
- Can ALL students access the activity?
- How do students demonstrate mastery?

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Math Standards Revisions – Potential Gaps

Grades 6-8:

- Shifted Compound Probability standard
  - Moved from seventh to eighth grade
- Revised Geometry standards
  - Removed from seventh grade: slice of 3-dimensional objects
  - Removed from eighth grade: congruency and similarity of 2-dimensional objects

Grades 9-12:

- Shifted a number of standards from Algebra II and Integrated Math III to the Additional Math Courses

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Reflect

"High-quality coherent mathematics programs help students make sense of mathematics by situating the mathematics in problem solving contexts, so that students learn the mathematics in order to answer meaningful questions in real-world or mathematical contexts. Explicit attention is paid to promoting students' conceptual understanding of mathematical content as well a mathematical thinking and reasoning practices so that the mathematics itself makes sense to students. By linking mathematical topics within and among mathematical domains, mathematics appears as a unified discipline rather than as a collection of topics."

—from *Principles to Actions*

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Module 8 Review

The review process of instructional materials will:

- Deepen understanding of the standards,
- Make use of screening instruments to analyze materials to determine alignment or gaps, and
- Result in wise decisions about how best to use the materials already on-site to teach the new standards to mastery OR effectively fill any gaps uncovered in the review process.

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Part Four

Aligned Materials and Assessments

Educators play a key role in ensuring that our standards and classroom instructional materials, and assessments are aligned.

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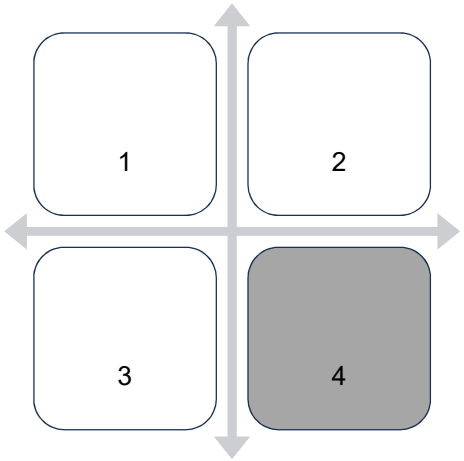
Appointment with Peers



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10-Minute Break

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Part 5: Putting It All Together

Key Ideas

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Module 9: Instructional Planning

Goals

- Understand intentional instruction as a bridge between good standards and assessment.
- Develop lesson planning techniques to strengthen the understanding of the relationship between standards and practice.
- Create lessons based on the revised standards to be used for instruction.

Rationale

"…teachers have a responsibility to make day-to-day instructional choices that ensure that students work with problems that engage their interest and their intellect."

—Cathy L. Seeley, 2014

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Designing Effective Learning Experiences

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What is Intentional Instruction?

- What does “intentional” mean?
- Keep standards in mind—what standards are driving your instruction?
- Keep assessment in mind—what are your end goals? What do students need to…
  - **K**now,
  - **U**nderstand, and
  - **D**o to meet these standards?

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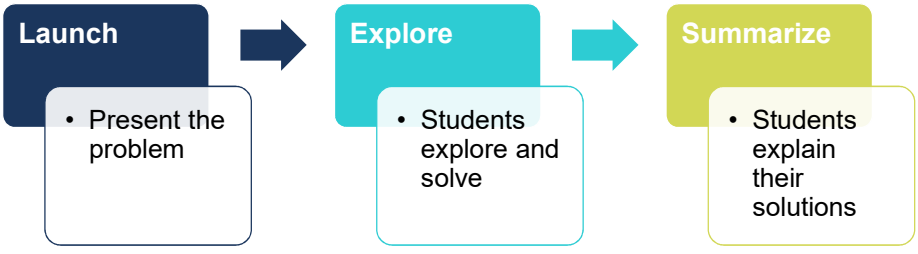
Intentional Instruction Structure



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Three-phase Lesson Plan

- Launch – present the contextual problem/task
- Explore – allow plenty of time for students to explore and solve the problem
- Summarize
  - The **most important** part of the lesson comes when students explain their solution problems.
  - Encourage students to question their classmates.
  - In other words, use accountable talk or number talks.

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Launch Phase

- Ask students to talk about what is happening in the problem (literacy module).
- Review vocabulary (literacy module).
- Encourage describing the relationships between the quantities.
- What will the answer tell us? (making sense)
- Explain that they may chose which tools to use.

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Explore Phase

- Let go!
- Start with a private (individual) work time for a few minutes.
- Have tools and/or manipulatives available.
- Allow students to use any method they choose to work the problem.

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Explore Phase

- After a few minutes, move to small group problem solving where students work together.
- Observe student work and ask questions.
- Monitors to select solution strategies to share based on different solution paths, different representations, common errors, and misconceptions.

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Summarize Phase

- The teacher carefully selects strategies to be shared that build and focus on big ideas.
- Students share, compare, discuss, and reflect on their thinking. Students reflect to make connections among representations.

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Planning for Instruction

Putting It All Together

1. Review standard, determine KUD
2. Evaluate instructional materials
3. Utilize Launch, Explore, and Summarize model
4. Assess learning

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Step 1: Review the Standard

- Review the standard
  - Was the standard the same or has it been revised?
  - Has the learning changed?
  - How do the SMPs, literacy skills, and instructional shifts apply?
  - What do students need to know, understand, and do?

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Grade Level Examples

- **6.RP.A.3 Use ratio and rate reasoning to solve real-world and mathematical problems (e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations).**

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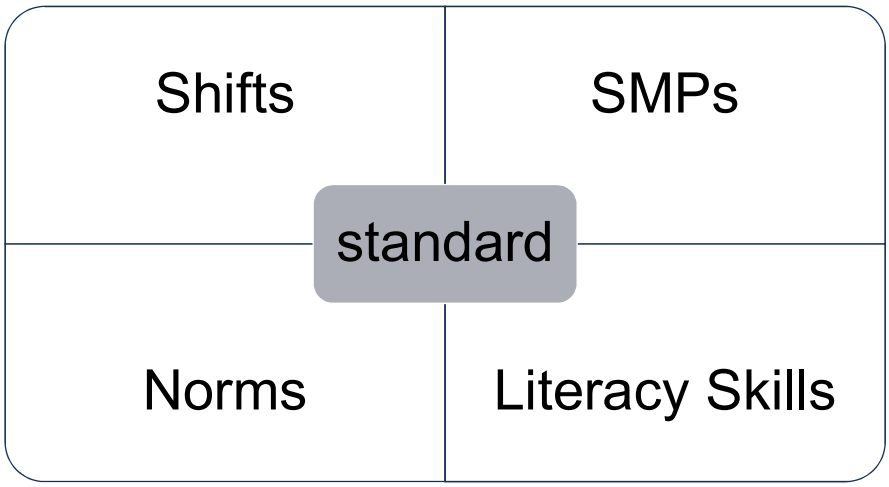
Intentional Planning



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Where is the Literacy?

- Graphic Organizers
  - Graphic Organizers are a beneficial instructional tool to help students organize their thoughts.
  - Some graphic organizers are appropriate for math.
  - We will demonstrate utilizing the Four Corners and Frayer's Model.

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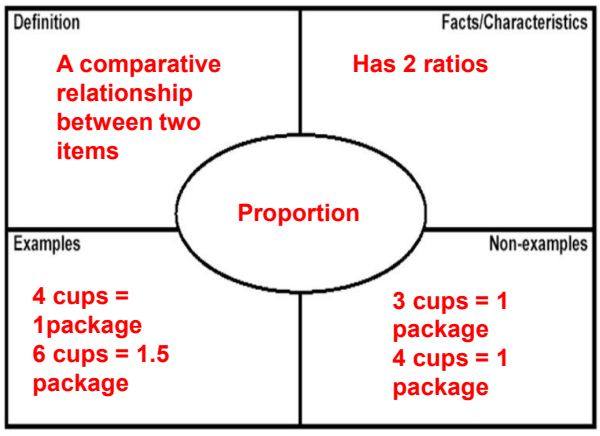
Frayer's Model



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Step 2: Evaluate Instructional Materials

- Use the Materials Review Instrument.
- Evaluate textbook and supplemental materials for alignment.

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Step 3: Create Learning Experiences

- Plan with the *end in mind*.
- What will the teacher be doing?
- What will the students be doing?
- What will the classroom look and sound like?
- What literacy standards and mathematical practices will be incorporated?

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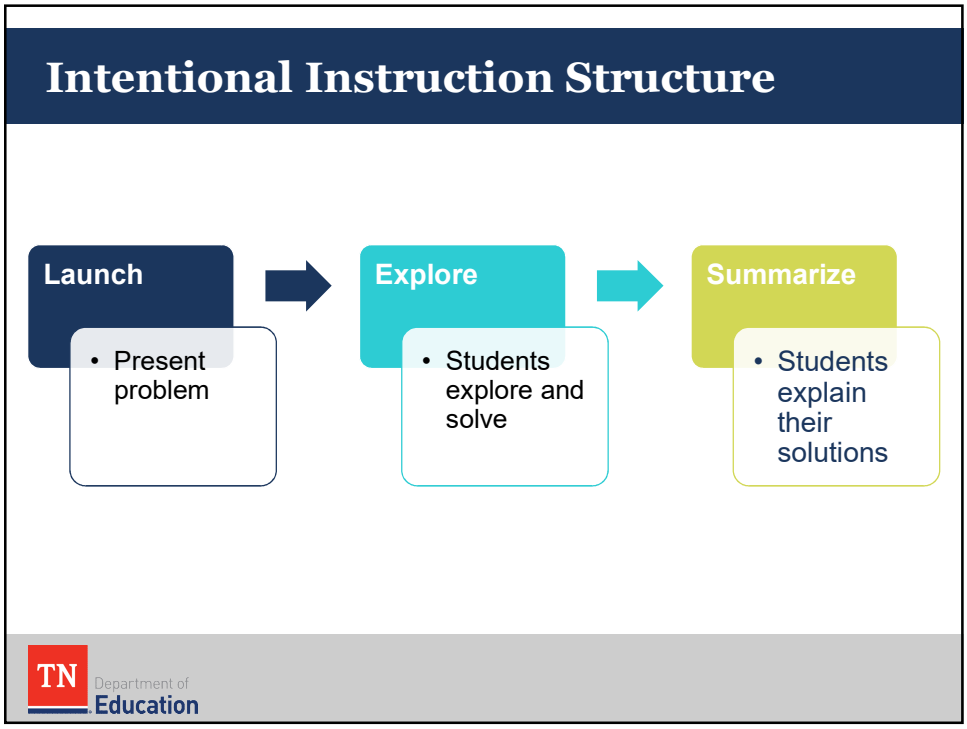
Intentional Instruction Structure
Launch
• Present problem
Explore
• Students explore and solve
Summarize
• Students explain their solutions
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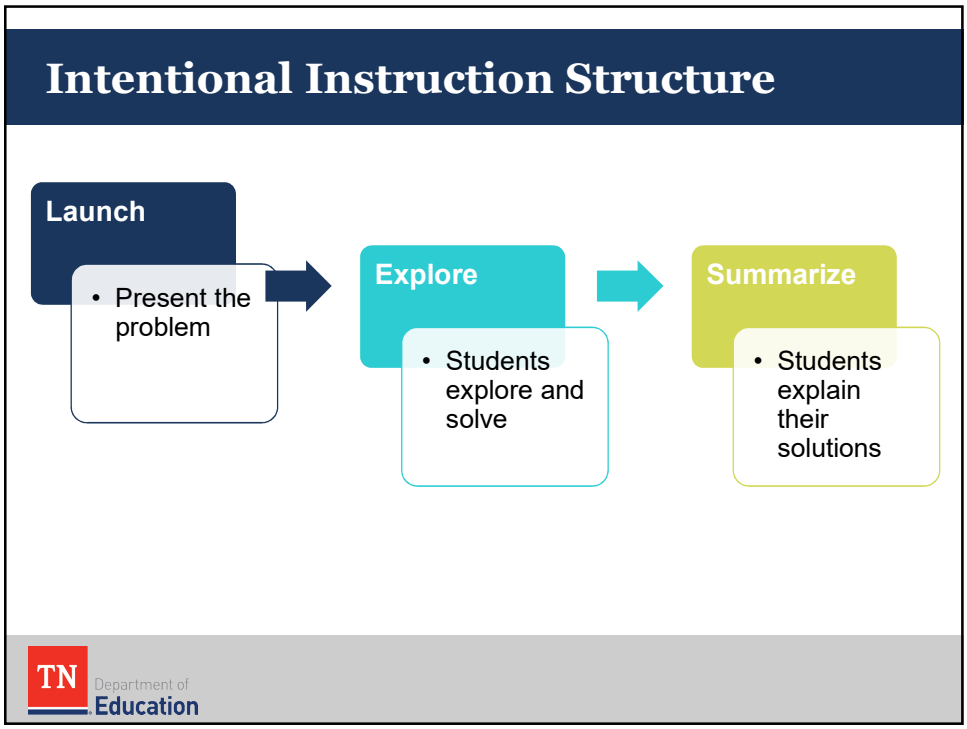
Intentional Instruction Structure
Launch
• Present the problem
Explore
• Students explore and solve
Summarize
• Students explain their solutions
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Sugar

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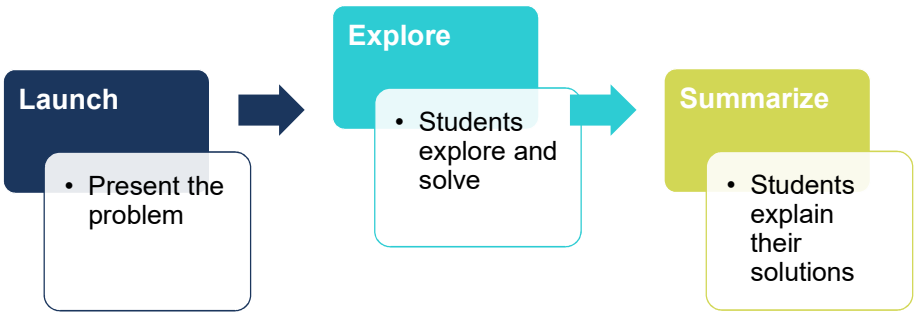
Intentional Instruction Structure



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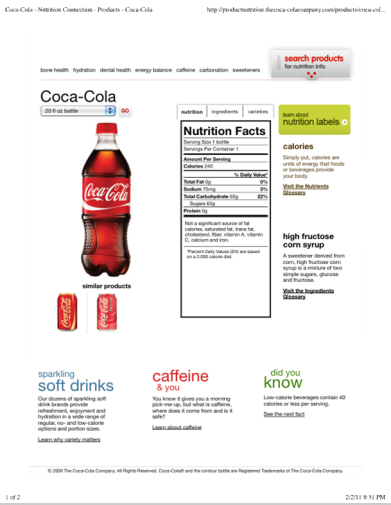
Coke Content



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Sugar Content in a Coke

- If you drink a 20 oz. Coke, how much sugar in terms of full packets do you consume?
- If you drink a 20 oz. Coke, how much sugar in terms of full packets do you consume?
  - Previous slide: There are 65 grams of sugar in a 20 oz. Coke. Also, there are 4 grams of sugar in a packet of sugar.

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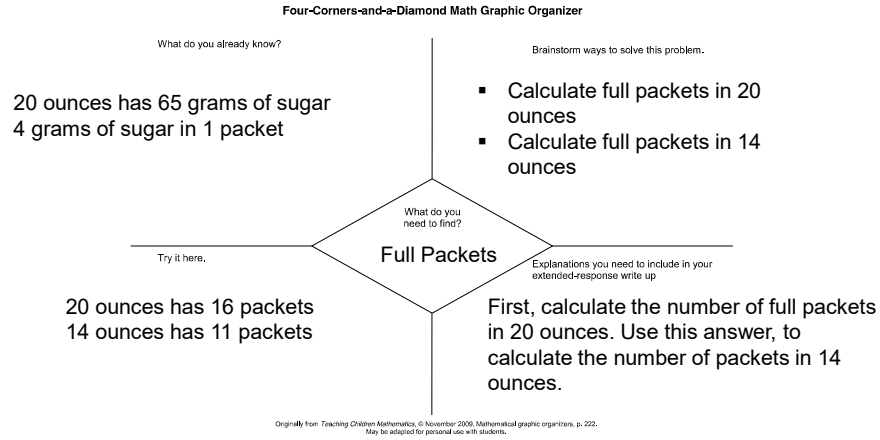
Four Corners Graphic Organizer



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Practice the Skill

- To practice the skill, place students in groups.
- Provide each group with three different drink options (Gatorade, Juices, Sodas, Teas, etc.).
- Require students in a group to calculate the sugar content and require them to calculate sugar packet content with different ounce options. Provide the different ounce options based on the full ounces in the drink. (Nestea is a 23 ounce bottle.)

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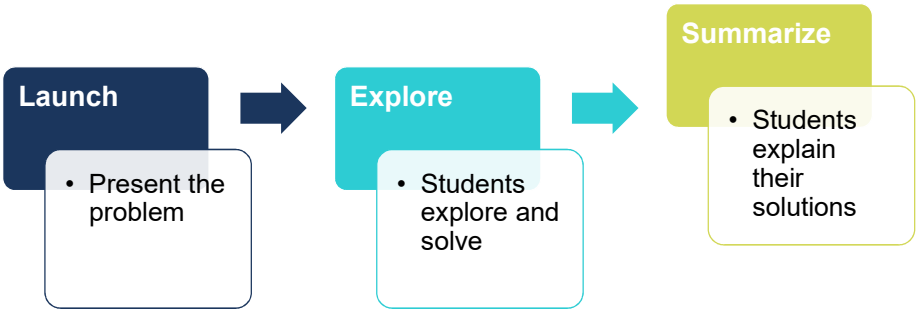
Intentional Instruction Structure



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Step 4: Assessment

- How will you know they have learned the concepts?
- Can you challenge their thinking during an assessment?
- How do you provide intervention for a specific student after instruction?

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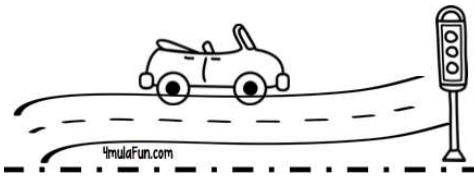
Proportions Exit Ticket

Name: _____Date: _____ Per: ___

Proportions Exit Ticket

Give an example of a proportion and explain the comparison. Compare values using cross products or common denominators.



Color the stoplight to show your understanding of proportions. Green= Good 2 Go Yellow= Need Practice Red= Have no clue!

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Your Turn

- Split into five groups.
- Select one of the identified standards for the group.
- Complete the four-step planning process:
  - Dig into the standards, determine KUD
  - Evaluate instructional materials
  - Create lesson outline and/or learning experiences
  - Assessment

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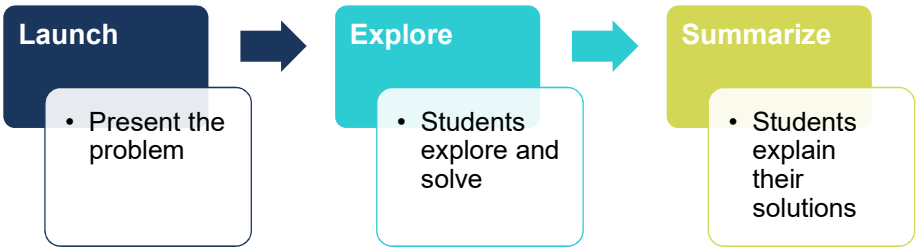
Intentional Instruction Structure



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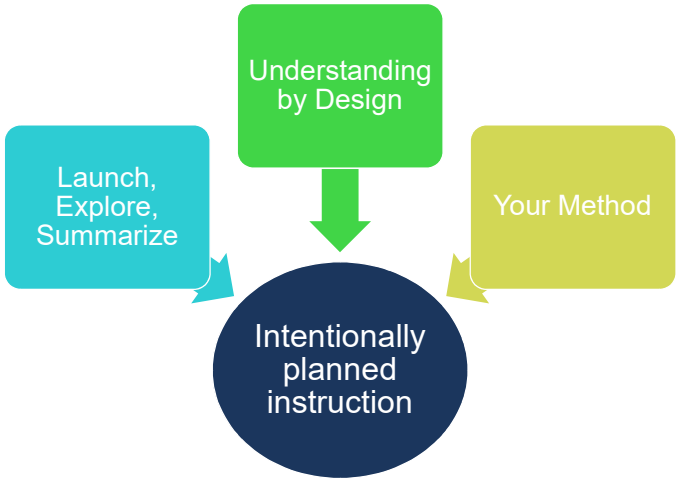
Many Ways to "Do" Intentional Planning



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Designing Effective Learning Experiences

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Part Five

Strong Standards

Standards are the bricks that should be masterfully laid through quality instruction to ensure that all students reach the expectation of the standards.

High Expectations

We have a continued goal to prepare students to be college and career ready.

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Part Five

Instructional Shifts

The instructional shifts are an essential component of the standards and provide guidance for how the standards should be taught and implemented.

Aligned Materials and Assessments

Educators play a key role in ensuring that our standards and classroom instructional materials, and assessments are aligned.

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Districts and schools in Tennessee will exemplify excellence and equity such that all students are equipped with the knowledge and skills to successfully embark on their chosen path in life.

Excellence | Optimism | Judgment | Courage | Teamwork