Building on Assessment – Day 1

Rev 5/4/23 (ce)

Opening

Building on Assessment - Day 1

It became a great day when you joined us!

Presenter Name, Presenter@cpm.org

Sign in and make a name tag.

Take a puzzle piece and find your seat.
Introduce yourself to your team.

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Opening

Housekeeping

+ Bathrooms
+ 8:00 AM – 4:00 PM
+ Breaks scheduled and as needed
+ Lunch
+ Parking Lot oster
+ Supply/resource table

Opening

Outcomes

Participants will:

+ Reflect on the efficacy of their current summative assessment practice.
+ Examine the chapter progression.
+ Examine and reflect on equitable assessment practices.
+ Utilize given tools to write a summative assessment.
+ Determine whether assessment questions provide students with the opportunity to demonstrate understanding.

Opening

Agenda

Assessment for Learning Over Time & Effective Assessment Questions

+ Opening
+ Learning Trajectory
+ Building Equity into your Assessment Culture
+ Evaluating Assessment Items
+ Writing Good Assessments
+ Closure

Opening

Professional Learning Portal

my.cpm.org

Professional Learning Portal


Assessment Action Plan


Learning Log


File Cabinet

Opening

Icebreaker

Learning Target

Participants will reflect on the efficacy of their current summative assessment practice.

Success Criteria (Know, Understand, Do)

- Participants know the difference between productive and unproductive beliefs.
- Teams understand how these beliefs might be visible in their own practice.
- Participants record strategies.

Opening

Beliefs about Mathematics Assessment

		PRODUCTIVE BELIEF
NCTM	1	The primary purpose of assessment is to inform and improve the teaching and learning of mathematics.
	2	Assessment is an ongoing process that is embedded in instruction to support student learning and make adjustments to instruction.
	3	Mathematical understanding and processes can be measured through the use of a variety of assessment strategies and tasks.
	4	Multiple data sources are needed to provide an accurate picture of teacher and student performance.
	5	Assessment is a process that should help students become better judges of their own work, assist them in recognizing high-quality work when they produce it, and support them in using evidence to advance their own learning.
	6	Ongoing review and distributed practice within effective instruction are productive test preparation strategies.

CPM	7	Authentic assessment means assessing in a manner that mirrors the way the students have learned, and focusing on what the students know, rather than what the students do not know.
	8	Assessment, as with the learning, should focus on the big ideas and the connections to assess for understanding, and not on the fine grain-sized skills.
	9	Assessment and teaching should be seamlessly interwoven, and time should be spent on both. Because of the lack of time most teachers have, it is important to assess wisely, and use the supports that are in place.
	10	Assessment is the process of understanding student learning, and grading is evaluating that understanding. The bulk of the teacher's time should be spent on assessing rather than grading.

Opening

Be willing to take **risks**.

Have a **visionary** mindset.

Stay **engaged**.

Explore and reflect on your **beliefs**.

Give **grace** to others and yourself.

Change takes time, effort, and support!

Opening

Effective Math Teaching Practices

Establish goals to focus learning.

Implement tasks that promote reasoning and problem solving.

Pose purposeful questions.

Support productive struggle in learning mathematics.

Elicit and use evidence of student thinking.

Opening

Assessment ≠ Grading

Opening

An Invitation to be Visionary

Engage as fully as you can.

Take risks and be vulnerable as a learner.

Set your intention for the day!

Learning Trajectory

Learning Target

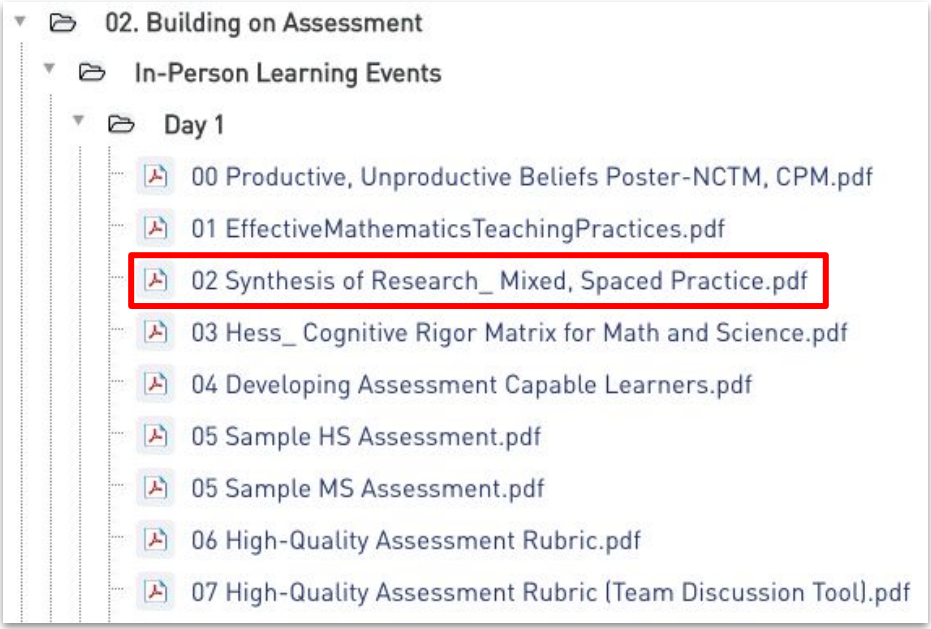
Participants will examine the chapter progression.

Success Criteria (Know, Understand, Do)

- Participants know what students are practicing in the Review & Preview.
- Participants understand which learning targets are summative and which targets are formative.
- Participants create a document that summarizes what students are practicing.

Learning Trajectory

Synthesis of Research: Think-Ink-Share

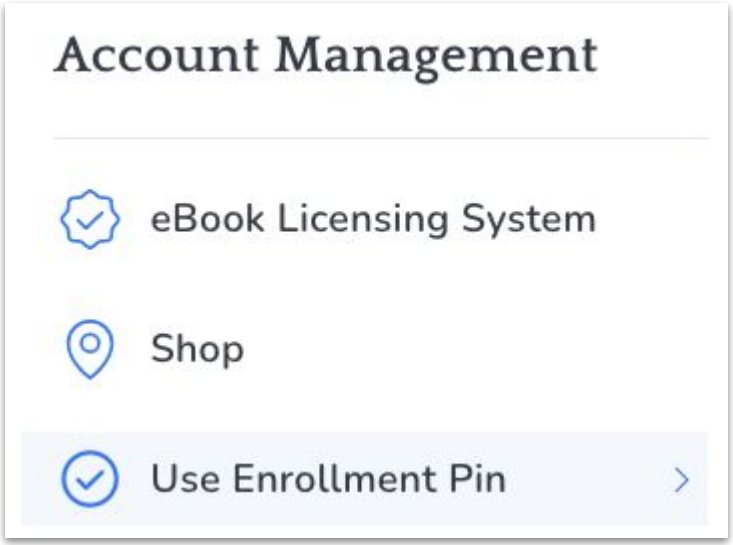


Be prepared to discuss the following with your team.

+ *In what ways are you already supporting assessing for learning over time?*
+ *In what ways do teachers undermine the idea of assessing for learning over time?*

Opening

Learning Event eBook Access



eBooks Access

my.cpm.org

Use Enrollment Pin

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Learning Trajectory

The Challenge

Developing an assessment system to complement CPM's Principle of **Mixed, Spaced Practice.**

Creating appropriate assessments that model the **mastery over time** component of CPM.

What topics can we expect most students to master by the end of this chapter?

What topics are in development and not yet ready to be assessed at a mastery level?

Learning Trajectory

Using CPM materials, we will:

- Identify formative or summative learning targets.
- Learn a process for tracking learning targets throughout a chapter/course.
- Identify multiple forms and levels of assessment to encourage mastery over time.

Learning Trajectory

Three Assumptions

Assessments must align with what students are practicing.

CPM materials will be the resource.

+ Review & Preview
+ Chapter Closure problems

The goal is to identify formative/summative learning targets.

+ Summative: material from prior chapters
+ Formative: material from current chapter

Learning Trajectory

CC3 - Chapter 4

In this chapter, you will learn:

- How to change any representation of data (such as a pattern, table, graph or rule) to any of the other representations.
- How to use the connections between patterns, tables, graphs, and rules to solve problems.

Checkpoint 4: Calculate the area and perimeter of circles and complex figures

Learning Trajectory

Standards

Teacher

Which standards are covered in CC3 Chapter 4?

Recorder/Reporter:
Create a list of standards for Chapter 4.

Huddle

Learning Trajectory

Unpack the Standards

Team Task

+ Read your team's assigned standard.
+ Reference the standard's nouns and verbs as you unpack the standard.

Purpose: *To ensure that assessments are written at an appropriate level.*

8.F.2. Compare properties…

8.F.4. Construct a function…

8.EE.6. Use similar triangles…

Learning Trajectory

Unpack the Standards

8.F.2. Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.

8.F.4. Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

8.EE.6. Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.

Learning Trajectory

CC3 – Chapter 4

Categorize CC3 Lesson 4.1.1 Review & Preview problems.

When possible, reference language from the chapter's standards.

Review & Preview

4-2. For each tile pattern in problem 4-1, draw Figures 0, 4, and 5 on graph paper. If it helps, copy Figures 1, 2, and 3 onto your paper. Homework Help ✎

4-3. On graph paper, draw Figure 0 and Figure 4 for the pattern at below. *4-3 HW eTool* (Desmos) Homework Help ✎

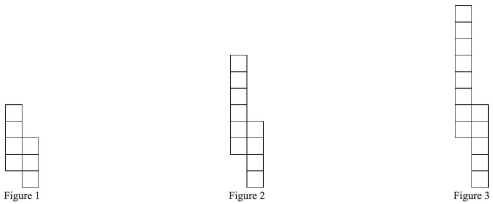

Figure 1 Figure 2 Figure 3

a. Represent the number of tiles in each figure in an $x \rightarrow y$ table. Let x be the figure number and y be the total number of tiles.

b. Use the table to graph the pattern.

c. Without drawing Figure 5, predict where its point would lie on the graph. Justify your prediction.

4-4. Evaluate the expressions below for the given values. Homework Help ✎

a. $3(2x + 1)$ for $x = -8$

b. $\frac{x-6}{4} - 1$ for $x = -14$

c. $-2m^2 + 10$ for $m = -6$

d. $k \cdot k \div k \cdot k \div k$ for $k = 9$

4-5. Copy and simplify the following expressions by combining like terms. Homework Help ✎

a. $x + 3x - 3 + 2x^2 + 8 - 5x$

b. $2x + 4y^2 - 6y^2 - 9 + 1 - x + 3x$

c. $2x^2 + 30y - 3y^2 + 4xy - 14 - x$

d. $20 + 3xy - 3xy + y^2 + 10 - y^2$

4.1.1 Review & Preview

4-2:

4-3:

4-4:

4-5:

4-6:

4-7:

4-8:

4-9:

4-10:

4-11:

Learning Trajectory

CC3 – Chapter 4

Elbow Partners

+ Pair A: 4.1.2, 4.1.3, 4.1.4
+ Pair B: 4.1.5, 4.1.6, 4.1.7

When possible, reference language from the chapter's standards.

Whole Team

+ Share results.
+ Categorize the Closure Problems.
+ Decide formative and summative topics.

Learning Trajectory

CC3 – Chapter 4 Objectives

In this chapter, you will learn:

- How to change any representation of data (such as a pattern, table, graph or rule) to any of the other representations.
- How to use the connections between patterns, tables, graphs, and rules to solve problems.

Checkpoint 4: Calculate the area and perimeter of circles and complex figures

Learning Trajectory

CC3 – Chapter 4 Objectives

Determine appropriate summative & formative categories.

(based on Review & Preview and Chapter Closure problems)

Formative: Chapter 4 Objectives

In this chapter, you will learn:

- How to change any representation of data (such as a pattern, table, graph or rule) to any of the other representations.
- How to use the connections between patterns, tables, graphs, and rules to solve problems.

Checkpoint 4: Calculate the area and perimeter of circles and complex figures

Summative: Checkpoints & Past Objectives

Take a Break

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Learning Trajectory

CC3 – Chapter 1, 2, & 3

To broaden our scope,
we will now analyze
CC3 – Chapters 1, 2, & 3.

Remember the language from
the math content standards.

Learning Trajectory

Huddle by Chapter

Consensus:

What are the formative targets?

What are the summative targets?

Learning Trajectory

Teammates Consult

How do CPM's philosophy of mastery over time and the principle of Mixed, Spaced Practice provide guidance for assessing student learning?

Learning Trajectory

Your Turn

Your Task:

+ Form course-alike teams.
+ Use the process you just learned to create the trajectory for your course.

    If you teach CC3, continue the trajectory starting with Chapter 5.

Building Equity Into Your Assessment Culture

Developing Assessment Capable Learners

Learning Target

Participants will examine and reflect on equitable assessment practices.

Success Criteria (Know, Understand, Do)

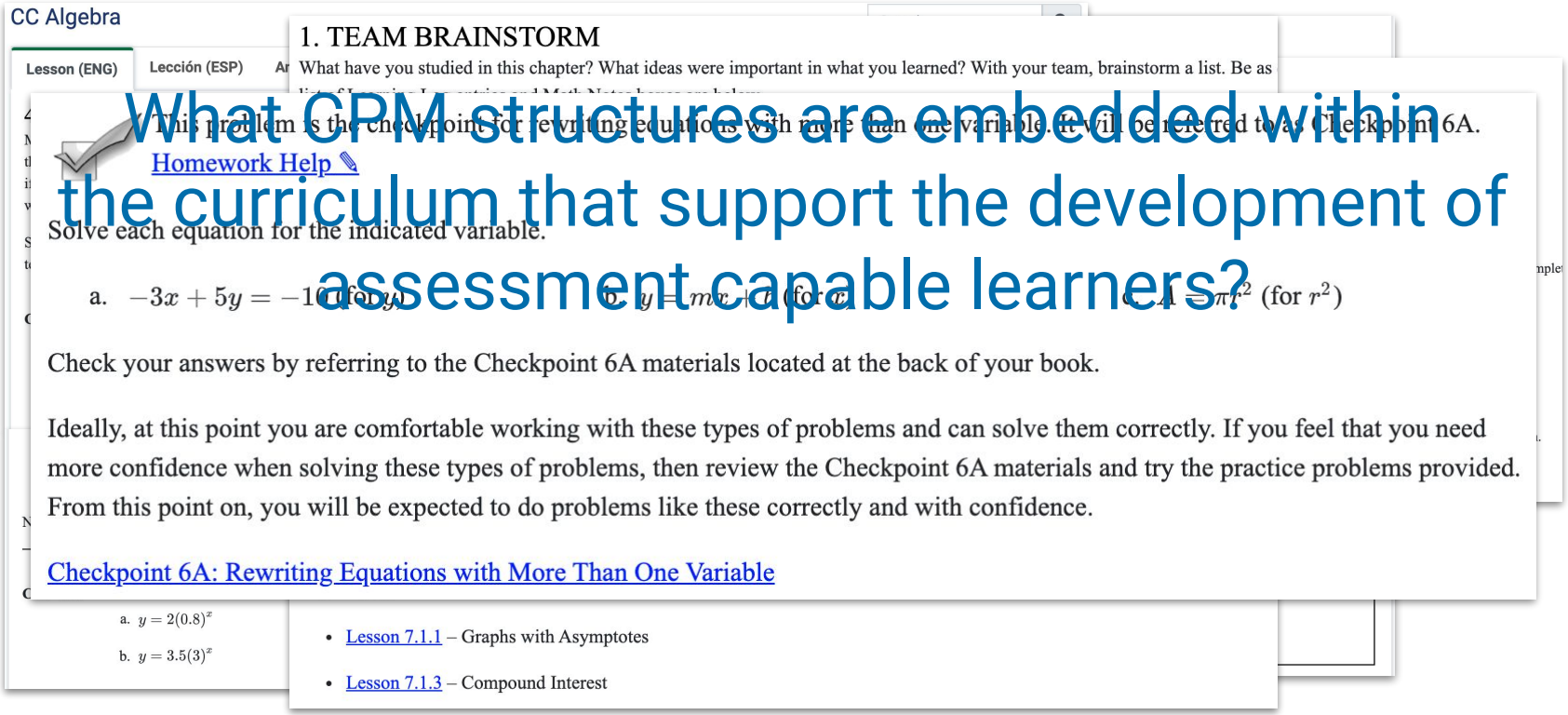
- Participants know the criteria that make learners assessment capable.
- Participants understand how to develop Assessment Capable Learners in their classrooms.
- Participants connect equitable assessment practices with productive assessment beliefs.

Assessment Capable Learners...

+ are aware of their current level of understanding in a learning area.
+ understand their learning path and are confident enough to take on the challenge.
+ can select tools and resources to guide their learning.
+ seek feedback and recognize that errors are opportunities to learn.
+ monitor their own progress and adjust course as needed.
+ recognize what they’re learning and can teach others.

Building Equity Into Your Assessment Culture

CPM and Assessment Capable Learners



What CPM structures are embedded within the curriculum that support the development of assessment capable learners?

Building Equity Into Your Assessment Culture

Assessment for Equity

1. Assessments and ”measurement” should be used to gauge student learning, development, and improvement over time.
2. Assessments should be used by teachers to adjust their practices (how they teach, what they teach, when they teach, and so forth) to respond to and meet the needs of students.
3. Students should not feel intimidated by assessments, but see them as opportunities to get a snapshot — a picture of where they are and what they need to do to improve.
4. Punitive assessments send the wrong message and can raise anxiety among learners, especially those who most need our support.
5. Assessment tools should be just as diverse as the students who take them.

Milner, H.R. (2018, February). Confronting Inequity / Assessment for equity. Educational Leadership, 75(5), 88-89. Retrieved from: http://www.ascd.org/publications/educational-leadership/feb18/vol75/num05/Assessment-for-Equity.aspx

Building Equity Into Your Assessment Culture

Closure

Your Task:

Select the most impactful reminder.

Find a partner.

+ Discuss why you selected that reminder.
+ Make connections to the Productive Beliefs.

Record your thoughts.

1. Assessments and “measurement” should be used to gauge student learning, development, and improvement over time.
2. Assessments should be used by teachers to adjust their practices (how they teach, what they teach, when they teach, and so forth) to respond to and meet the needs of students.
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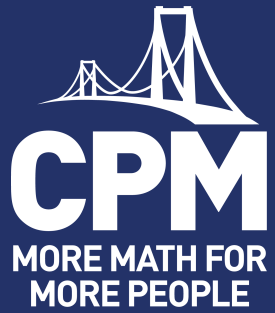
Lunch Time



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Welcome Back!

New Teams

Please sit with teachers who teach the same course.

Math Chat

Find the eight prompts around the room and respond to them in writing.

Access File Cabinet

Login to **my.cpm.org** → **Professional Learning Portal**

Evaluating Assessment Items

Assessment Tools

Learning Target

Participants will utilize given tools to write a summative assessment.

Success Criteria (Know, Understand, Do)

- Participants know what tools are available to evaluate assessments and assessment items.
- Participants understand how to use assessment tools to evaluate assessments and assessment items.
- Participants will use assessment tools to evaluate assessments and assessment items.

Bloom determines the cognition or thinking students are expected to demonstrate as part of a learning experience. That's the verb that starts the educational objective or academic standard.

Webb designates the context – the scenario, setting, and situation – students are expected to use to express and share what they are learning.

Revised Bloom's Taxonomy	Webb's DOK Level 1 Recall & Reproduction	Webb's DOK Level 2 Skills & Concepts	Webb's DOK Level 3 Strategic Thinking/Reasoning	Webb's DOK Level 4 Extended Thinking
Remember Retrieve knowledge from long-term memory, recognize, recall, locate, identify	o Recall, observe, & recognize facts, principles, properties o Recall/ identify conversions among representations or numbers (e.g., customary and metric measures)	Use these Hess CRM curricular examples with most mathematics or science assignments or assessments.		
Understand Construct meaning, clarify, paraphrase,	o Evaluate an expression o Locate points on a grid or number on number line	o Specify and explain relationships (e.g., non-examples/examples; cause-effect) o Make and record observations	o Use concepts to solve non-routine problems o Explain, generalize, or connect ideas	o Relate mathematical or scientific concepts to other content areas, other domains, or other concepts
	(e.g., area, perimeter) o Solve linear equations o Make conversions among representations or numbers, or within and between customary and metric measures	or figure and use it solve a problem requiring multiple steps o Translate between tables, graphs, words, and symbolic notations (e.g., graph data from a table) o Construct models given criteria	o Use & show reasoning, planning, and evidence o Translate between problem & symbolic notation when not a direct translation	
Analyze Break into constituent parts, determine how parts relate, differentiate between relevant-irrelevant, distinguish, focus, select, organize, outline, find coherence, deconstruct	o Retrieve information from a table or graph to answer a question o Identify whether specific information is contained in graphic representations (e.g., table, graph, T-chart, diagram) o Identify a pattern/trend	o Categorize, classify materials, data, figures based on characteristics o Organize or order data o Compare/ contrast figures or data o Select appropriate graph and organize & display data o Interpret data from a simple graph o Extend a pattern	o Compare information within or across data sets or texts o Analyze and draw conclusions from data, citing evidence o Generalize a pattern o Interpret data from complex graph o Analyze similarities/differences between procedures or solutions	o Analyze multiple sources of evidence o Analyze complex/abstract themes o Gather, analyze, and evaluate information
Evaluate Make judgments based on criteria, check, detect inconsistencies or fallacies, judge, critique	"UG" – unsubstantiated generalizations = stating an opinion without providing any support for it!		o Cite evidence and develop a logical argument for concepts or solutions o Describe, compare, and contrast solution methods o Verify reasonableness of results	o Gather, analyze, & evaluate information to draw conclusions o Apply understanding in a novel way, provide argument or justification for the application
Create Reorganize elements into new patterns/structures, generate, hypothesize, design, plan, produce	o Brainstorm ideas, concepts, or perspectives related to a topic	o Generate conjectures or hypotheses based on observations or prior knowledge and experience	o Synthesize information within one data set, source, or text o Formulate an original problem given a situation o Develop a scientific/mathematical model for a complex situation	o Synthesize information across multiple sources or texts o Design a mathematical model to inform and solve a practical or abstract situation

Bloom determines the cognition or thinking students are expected to demonstrate as part of a learning experience. That's the verb that starts the educational objective or academic standard.

Evaluating Assessment Items

Examining the Cognitive Rigor Matrix

Your Task:

For your assigned column…

+ **Read** the descriptors.
+ **Summarize** the student thinking necessary when solving tasks at this DOK level.

Facilitator

1: Recall & Reproduction

Resource Manager

2: Skills & Concepts

Recorder/Reporter

3: Strategic Thinking/Reasoning

Task Manager

4: Extended Thinking

Evaluating Assessment Items

Examining the Cognitive Rigor Matrix

Think & Ink

How is thinking at DOK 3 & 4 different than the thinking at DOK 1 & 2?

Proximity Partners

How can you tell a DOK 3 or 4 question from a DOK 1 or 2 question?

Evaluating Assessment Items

Using the Matrix as a Guide

Team Task:

+ **Sort** the items by Webb's DOK (1, 2, 3, or 4).
+ **Be prepared** to justify your decisions!

Resource Manager: Make sure the matrix is being used to justify decisions

Facilitator: Ensure each problem is read aloud

Recorder/Reporter: Be prepared to share your team's thinking

Task Manager: Support your team with sorting each problem

Whiparound

Evaluating Assessment Items

Suggested Levels

Middle School

1. Recall & Reproduction
   1-49, 6-44
2. Skills & Concepts
   1-38, 1-45, 1-117
3. Strategic Thinking/Reasoning
   1-26, 1-53, 6-75, 9-19
4. Extended Thinking
   1-17, 8-58

High School

1. Recall & Reproduction
   2-50, 9-94
2. Skills & Concepts
   3-40, 5-88, 7-3, 8-38
3. Strategic Thinking/Reasoning
   3-71, 5-84, 9-53
4. Extended Thinking
   9-92, 10-65

Evaluating Assessment Items

Quick Write

How will your awareness of the Cognitive Rigor Matrix impact items you write or choose for individual and team assessments?

How can it help you decide success criteria?

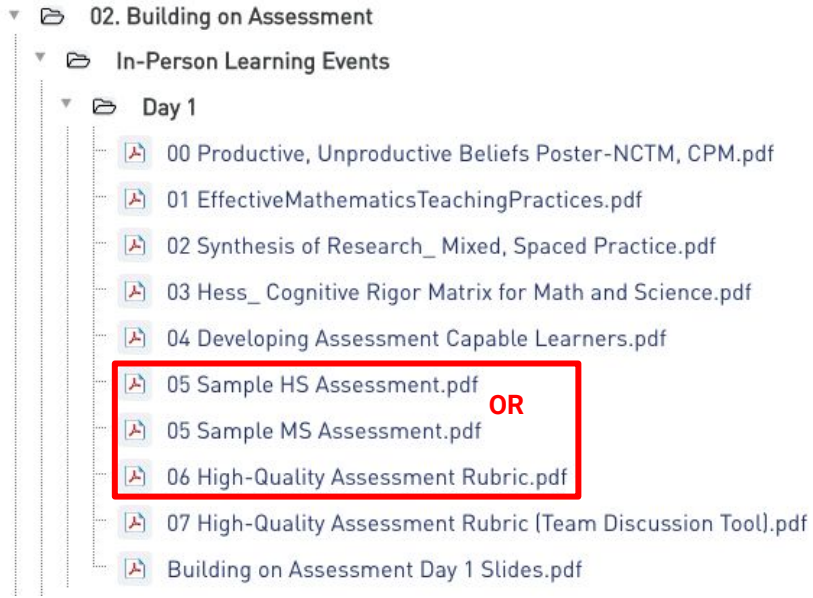
Evaluating Assessment Items

When evaluating the quality of an assessment, remember:

+ Assessment is an ongoing process designed to develop mastery over time.
+ Assessment should inform teacher practice through a variety of opportunities.
+ Consider how Depth of Knowledge impacts student thinking.

Evaluating Assessment Items

Evaluating Quality



Your Task:

+ With a partner, use the High-Quality Assessment Rubric to rate the quality of an assessment in each category.
  + Use the Cognitive Rigor Matrix to help with the last piece of the rubric.
+ **Be prepared** to cite evidence that justifies your scores!

Take a Break

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Writing Good Assessments

Characteristics of Questions that Demonstrate Student Understanding

Think-Ink (Pair-Share)

Think of an assessment item that allows students to demonstrate learning and use flexible thinking to show understanding.

Ink characteristics of that item.

Stand up.

Share your ideas.

Find **three** other ideas.

Give One, Get One

Writing Good Assessments

Characteristics of Questions that Demonstrate Student Understanding

Learning Target

Participants will determine if assessment questions provide students with the opportunity to demonstrate understanding

Success Criteria (Know, Understand, Do)

- Participants know what understanding looks and sounds like.
- Participants recognize what it means to understand a concept.
- Participants write assessment items that allow for flexible thinking in order for students to demonstrate understanding and evaluate those items.

Writing Good Assessments

Research

Students who understand a concept can:

+ use it to make sense of and explain quantitative situations (Model with Mathematics);
+ incorporate it into their own arguments and use it to evaluate the arguments of others (Construct viable arguments and critique the reasoning of others);
+ bring it to bear on the solutions to problems (Make sense of problems and persevere in solving them); and
+ make connections between it and related concepts.

Dr. James Williams, NCCTM, October, 2011

Which would you like to be more mindful of?

Writing Good Assessments

What have we discussed?

Identifying formative & summative assessment targets.

+ Unpack the standard
+ Use the Learning Trajectory and Suggested Assessment Plan

Recognizing DOK level.

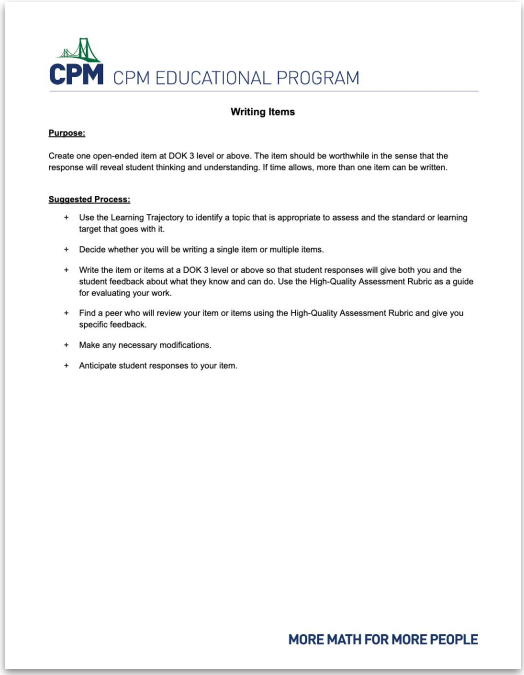
Characteristics of assessment items that demonstrate student understanding.

Writing Good Assessments

Writing an Assessment Item

Team Task:

+ **Collaborate** with course-alike teachers.
+ **Write** open-ended item(s) at DOK 3 or 4.
  + The item should allow students to demonstrate thinking/understanding.
  + See “Suggested Process”.
+ If time allows, write additional items or continue working on your learning trajectory.



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Writing Items

Purpose:

Create one open-ended item at DOK 3 level or above. The item should be worthwhile in the sense that the response will reveal student thinking and understanding. If time allows, more than one item can be written.

Suggested Process:

+ Use the Learning Trajectory to identify a topic that is appropriate to assess and the standard or learning target that goes with it.
+ Decide whether you will be writing a single item or multiple items.
+ Write the item or items at a DOK 3 level or above so that student responses will give both you and the student feedback about what they know and can do. Use the High-Quality Assessment Rubric as a guide for evaluating your work.
+ Find a peer who will review your item or items using the High-Quality Assessment Rubric and give you specific feedback.
+ Make any necessary modifications.
+ Anticipate student responses to your item.

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Writing Good Assessments

Proximity Partner

+ Swap items with your proximity partner.
+ Use the High-Quality Assessment Rubric to rate the quality of the item.
+ On a sticky note, write two strengths and one suggestion.
+ Discuss the strengths and suggestion.

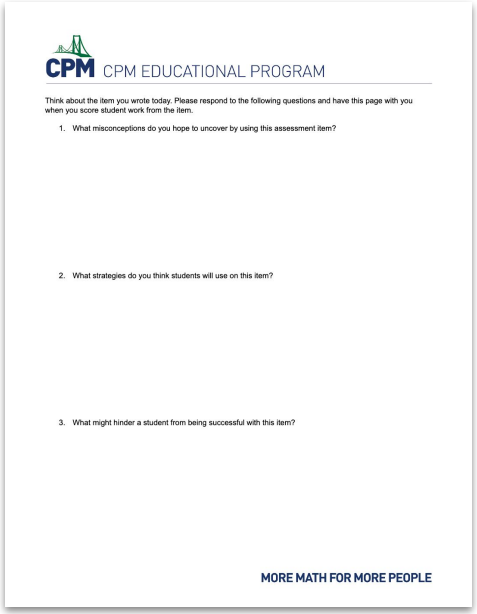
Writing Good Assessments

Revisions and Reflection

Closure

Make revisions to your item.

Anticipate student responses.



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Think about the item you wrote today. Please respond to the following questions and have this page with you when you score student work from the item.

1. What misconceptions do you hope to uncover by using this assessment item?

2. What strategies do you think students will use on this item?

3. What might hinder a student from being successful with this item?

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Closure

Outcomes

Participants will:

- Reflect on the efficacy of their current summative assessment practice.
  - Identifying Productive and Unproductive Assessment Beliefs
- Examine the chapter progression.
  - MSP Research, Unpack Standards, Learning Trajectory
- Examine and reflect on equitable assessment practices.
  - Building Equity into your Assessment Culture, Developing Assessment Capable Learners
- Utilize given tools to write a summative assessment.
  - Writing Good Assessments
- Determine whether assessment questions provide students with the opportunity to demonstrate understanding.
  - Evaluating Assessment Items, Writing Good Assessments

Closure

How can the Study Team & Teaching Strategies support effective assessment?

Ambassador	Fishbowl	I Spy	Math Chat	Reciprocal Teaching	Think-Ink-Pair-Share (T.I.P.S)
Carousel: Around the world	Fortune Cookie	Jigsaw: 4 Corners	Notice & Wonder	Red Light, Green Light	Think-Pair-Share
Carousel: Station Rotation	Gallery Walk	Numbered Heads	Participation Quiz	Silent Appointment	Traveling Salesman
Carousel: Index Card	Give One, Get One	Pairs Check (Chat)	Peer Edit	Silent Debate	Tuning Protocol
Dyad	Hot Potato	Participation Quiz	Pick Three	Swapmeet	Walk and Talk
Elevator Talk	Huddle	Listening Post	Proximity Partner	Teammates Consult	Whiparound

Closure

Beliefs about Mathematics Assessment

		PRODUCTIVE BELIEF
NCTM	1	The primary purpose of assessment is to inform and improve the teaching and learning of mathematics.
	2	Assessment is an ongoing process that is embedded in instruction to support student learning and make adjustments to instruction.
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	10	Assessment is the process of understanding student learning, and grading is evaluating that understanding. The bulk of the teacher's time should be spent on assessing rather than grading.

Closure

Effective Math Teaching Practices

Establish goals to focus learning.

Implement tasks that promote reasoning and problem solving.

Pose purposeful questions.

Support productive struggle in learning mathematics.

Elicit and use evidence of student thinking.

Closure

Self-Assessment

CPM EDUCATIONAL PROGRAM

BUILDING ON ASSESSMENT LEARNING EVENT – SELF-ASSESSMENT

Equity and Questioning

Things to Remember:

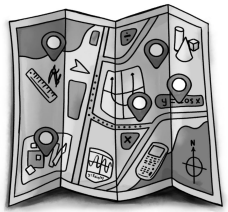
1. Examine and reflect on equitable assessment practices. (AP5)

This document will be used on Days 2 and 3.

Closure

Assessment Action Plan

Title: Summative Assessment Practices



I plan on implementing the following idea(s) from today's session.

Consider:

+ Why you chose the item(s).
+ How will you hold yourself accountable?
+ What will successful implementation look like?

Closure

Triads - **Whiparound**

Share…

+ Your actionable item.
+ Why you chose that item.
+ How you will hold yourself accountable.
+ What successful implementation will look like.

Closure

- Parking Lot
- Attendance & Feedback
  - In the Portal
- The focus of Day 2 is **Assessing for Learning** and **Developing Student Self-Awareness**
- Continuing Education Credit

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