


Module 3: Formative Assessment: Supporting teachers as they create or select formative assessments during or after instruction

Micro-Course 3:
Supporting teachers to accelerate learning using formative assessment processes in the classroom

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National Center for the Improvement of Educational Assessment

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Warm-Up

Which of these examples represent a formative assessment and why?

- A. Teachers analyze student math tests to evaluate the quality of their math curriculum.
- B. A school tests students every 12 weeks to predict which students are “on track” to score proficient on the end-of-year state test.
- C. Exit ticket question after a lesson: “What is the difference between mass and weight?”
- D. Teacher instructs students to use white boards to “Sketch the graph of $y=2x + 5$. Then turn and talk to explain your thinking to your elbow partner.”

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Defining the Formative Assessment Process

*“...a **planned, ongoing process** used by all students and teachers **during learning and teaching** to **elicit and use evidence of student learning** to **improve student understanding** of intended disciplinary learning outcomes and support students to become self-directed learners.”*

Council of Chief State School Officers (2018, p. 2). Revising the Definition of Formative Assessment. Retrieved from <https://ccsso.org/resource-library/revising-definition-formative-assessment>

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Embedded Formative Assessment Strategies

	Where the learner is going	Where the learner is now	How to get there
Teacher	Clarifying, sharing, and understanding learning intentions and success criteria	Engineering effective discussions, tasks, and activities that elicit evidence of learning	Providing feedback that moves learning forward
Peer		Activating students as learning resources for one another	
Learner		Activating students as owners of their own learning	

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In this module, school leaders will examine learning intentions and engineering effective discussions, tasks, and activities in more detail in ways aligned to the teacher module.

The goal is to help school leaders support the implementation and change process around these practices in their schools and districts.

Sharing learning intentions and success criteria	Is it clear what students are trying to learn? Has the teacher illustrated what success, or hitting the target, looks like?	
Engineering effective discussions, tasks, and activities that elicit evidence of learning	How does the teacher use strategic questions, readiness pre-assessments, tasks/activities, and/or other formative assessment techniques to identify student learning progress before, during, and/or after instruction?	

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Eliciting Evidence of Learning



There is no single way to elicit evidence of student learning.
Techniques can include:

Questions	Performances
Observations	Problem-solving
Representations	Exit tickets
Explanations	Notes

Key point: formative assessment probes enable the teacher to access information about how the students are learning in order to better plan how to improve their learning.

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A Note About Eliciting Evidence

Dylan Wiliam (2018) states that there are only two good reasons to ask questions in class:



- 1) to cause thinking, and
- 2) to provide information for the teacher about what to do next instructionally.

William, D. (2018). *Embedded Formative Assessment*. Bloomington, IN: Solution Tree Press, pp. 90-91.

The formative assessments identified for a lesson should allow students' thinking to be made visible and provide actionable information.

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Strategic Questioning

Increase student accountability when responding to complex questions by

1. Planning questions in advance of the lesson
2. Promoting “productive struggle”
3. Requiring “wait time” and collegial conversations

Additional resources:



- [Understanding by Design \(1998\)](#) by Grant Wiggins and Jay McTighe (p.167)
- [Embedded Formative Assessment \(2018\)](#) by Dylan Wiliam
- [Formative Assessment: Making it Happen in the Classroom \(2010\)](#) by Margaret Heritage

Example question stems:

- *What might you infer from...?*
- *What evidence supports ...? Why?*
- *What approach/strategy could you use to...?*
- *How might we prove or confirm...?*

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Identifying ‘Look Fors’ & Supporting Best Practices

Formative Assessment Process Discussion Tool for School Leaders

<p>Sharing learning intentions and success criteria</p>	<p><i>Is it clear what are students trying to learn?</i></p> <p><i>Has the teacher illustrated what success, or hitting the target, looks like?</i></p>	<p style="background-color: #f4a460; color: white; padding: 5px;">Take a few minutes and identify what you could look for related to sharing learning intentions and success criteria as you do walk throughs or observe teaching in your school or district.</p> <p style="font-size: small;">Then try it out. What did you notice after conducting brief walk throughs? Do teachers share lesson learning targets? Are these learning targets directly related to the standards? Do students understand the meaning of the learning targets and how it relates to the lesson activities?</p> <p style="font-size: small;">What types of resources, conversations, or others supports might teachers need to build their professional practice in this area? How can you support that development?</p>
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Using the Formative Assessment Rubrics, Reflection and Observation Tools to Support Professional Reflection on Practice (Revised)

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1 Not Observed	2 Beginning	3 Developing	4 Progressing	5 Extending
The teacher does not provide criteria for students. Criteria for success are just a list of correct answers (e.g., vocabulary list, list of important historical dates, math fact sheet).	The criteria for success are not appropriate for the learning goals and/or the students and are not expressed in language that is accessible to the students. The teacher presents or reviews the criteria with students but does not provide a way for students to understand or use the criteria effectively, resulting in few students engaging with the criteria in meaningful ways.	The criteria for success are appropriate for the learning goals and for the students, and they are expressed in language that is accessible to the students. The teacher engages the students with the criteria by providing a way for students to understand or use the criteria effectively, but only some students seem to understand or engage with the criteria in meaningful ways.	The criteria for success are appropriate for the learning goals and for the students, and they are expressed in language that is accessible to the students. The teacher deeply engages the students with the criteria by providing a way for students to understand or use the criteria effectively, allowing the majority of students to engage with the criteria in meaningful ways that support learning throughout the lesson.	The criteria for success are appropriate for the learning goals and for the students, and they are expressed in language that is accessible to the students. The teacher deeply engages the students with the criteria by providing a way for students to understand or use the criteria effectively, allowing the majority of students to engage with the criteria in meaningful ways that support learning throughout the lesson.

See Criteria for Success (pages 42-44) in the following document:

- Using the Formative Assessment Rubrics, Reflection and Observation Tools to Support Professional Reflection on Practice: Rubrics for the implementation of formative assessment processes

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Identifying 'Look Fors' & Supporting Best Practices

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Formative Assessment Process Discussion Tool for School Leaders

Engineering effective discussions, tasks, and activities that elicit evidence of learning	How does the teacher use strategic questions, readiness pre-assessments, tasks/activities, and/or other formative assessment techniques to identify student learning progress before, during, and/or after instruction?	<p>Take a few minutes and identify what you could look for related to strategic questions and activities that elicit student learning as you do walk throughs or observe teaching in your school or district.</p> <p>Then try it out. What did you notice after conducting brief walk throughs? Do they make students' thinking visible? In what way? Do they provide the teacher with information about what students have learned? Do they provide the teacher with actionable information? How do you know?</p> <p>What types of resources, conversations, or others supports might teachers need to build their professional practice in this area? How do you suggest that development?</p>
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Using the Formative Assessment Rubrics, Reflection and Observation Tools to Support Professional Reflection on Practice (Revised)



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1 Not Observed	2 Beginning	3 Developing	4 Progressing	5 Extending
The teacher did not engage the class with any tasks or activities to elicit evidence of student learning. Most students are unclear about how they need to approach the task, and the teacher makes little time to repeat or re-explain. The teacher does not review student work products during the lesson or does not indicate when they will be reviewed.	The teacher uses tasks or activities that are not aligned to the learning goals and will provide incomplete evidence of student progress toward those goals. Many students are unclear about how they need to approach the task, and the teacher makes little time to repeat or re-explain. The teacher occasionally reviews student work products during the lesson or makes a vague reference to when they will be reviewed.	The teacher uses well-crafted tasks and activities that are closely aligned to the learning goals and will provide complete evidence of student progress toward those goals. A few students are unclear about how they need to approach the task, and the teacher takes minimal time to repeat or re-explain. The teacher reviews student work products during the lesson in a way that provides insight into most students' progress or indicates how work products will be reviewed later.	The teacher uses a variety of integrated, well-crafted tasks and activities that are tightly aligned to the learning goals and will provide evidence of student progress toward those goals. Most or all students are clear about how they need to approach the task and are able to begin work effectively. The teacher systematically reviews student work products during the lesson in a way that provides insight into most or all students' progress or clearly indicates how they will be reviewed and how the information will be used to inform instruction.	The teacher uses a variety of integrated, well-crafted tasks and activities that are tightly aligned to the learning goals and will provide evidence of student progress toward those goals. Most or all students are clear about how they need to approach the task and are able to begin work effectively. The teacher systematically reviews student work products during the lesson in a way that provides insight into most or all students' progress or clearly indicates how they will be reviewed and how the information will be used to inform instruction.

See Tasks and Activities that Elicit Evidence of Student Learning, pages 46-48.

- Using the Formative Assessment Rubrics, Reflection and Observation Tools to Support Professional Reflection on Practice: Rubrics for the implementation of formative assessment processes

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Selecting Formative Assessments-Scenario #1

Unit Goals: Gr 3 Math

3.NBT.1: Use place value understanding to round whole numbers to the nearest 10 or 100.



3.NBT.2: Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

3.MD.1: Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

3.MD.2: Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem.

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Selecting Formative Assessments

Standards	Topics and Objectives	Days
3.NBT.2 3.MD.1	A Time Measurement and Problem Solving Lesson 1: Explore time as a continuous measurement using a stopwatch. Lesson 2: Relate skip-counting by fives on the clock and telling time to a continuous measurement model, the number line. Lesson 3: Count by fives and ones on the number line as a strategy to tell time to the nearest minute on the clock. Lesson 4: Solve word problems involving time intervals within 1 hour by counting backward and forward using the number line and clock. Lesson 5: Solve word problems involving time intervals within 1 hour by adding and subtracting on the number line.	5

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Selecting Formative Assessments: Gr 3 Math Example

During Instruction


Label the 5-minute intervals.



Plot the time 5:31 p.m.





Work with a partner to find the difference between 5:31 p.m. and 5:43 p.m. using the number line.



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Selecting Formative Assessments: Gr 3  

Math Example


Independent reading time starts at 1:34 p.m. It ends at 1:56 p.m.

1. Draw the start time on the clock below.

2. Draw the end time on the clock below.



3. How many minutes does independent reading time last?

After Instruction



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Selecting Formative Assessments-Scenario #2  

6.1 Light & Matter: Why do we sometimes see different things when looking at the same object?



NGSS Performance Expectation (PE) Standards:

MS-PS4-2: Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.

MS-LS1-8: Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.

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Selecting Formative Assessments  

In this lesson, students will:

1.A Develop a model to identify the important parts of the system and how those parts interact that could cause an object to look different in different light conditions.

1.B Ask questions that arise from observations of a phenomenon in which an object appears different depending on the light conditions within the defined system.

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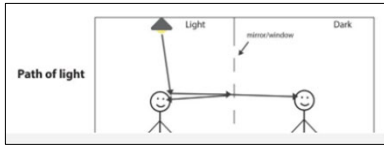
Selecting Formative Assessments



Diagram interactions between the important parts.

Once students get all the important parts into the diagram and labeled, ask them to add pictures, symbols, and words to show how the parts work and interact to answer the two questions, as their initial attempt to explain the phenomenon.

Give students up to 5 minutes to work individually to diagram what they think is happening. Use this diagram as a formative assessment to monitor students' initial ideas about how we see objects; specifically, the extent to which their models reflect a "line of sight" or a "path of light."



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Selecting Formative Assessments



Specific Look Fors:

(1) Agreement on key components or parts to include, such as two rooms or sides, a mirror-window between the sides, one side being lit, one side being dark; (2) uncertainty or disagreement on whether the people or eyes are an important part; and (3) use of a "path of light" model, "line of sight" model, or combination, which can be indicated by the way students use or do not use arrows in their diagrams:

- arrows pointing away from the eyes, or
- arrows pointing away from the source of the light and bouncing away from objects, and arrows pointing into the eyes, or
- a combination of the above

Arrows pointing away from the light source may be a representation of the "path of light" (POL). If students also include an arrow entering the eyes, this may indicate a clear understanding of the 4th-grade model of light, tracing the light from a source, then bouncing off objects and into our eyes. Arrows pointing away from the eyes may be a representation of what is seen, or the "line of sight" (LOS). A combination of arrows may map partially onto both POL and LOS models.

This curriculum even provides specific 'look for' recommendations to teachers.

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Purposes of Student Work Analysis



Quality of student thinking and learning



Student misconceptions and opportunity to learn

Different levels of student performance

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Student Work Analysis Process

Download Tool: [Student Work Analysis Protocol for Instructional Purposes](#)

Quick Sort

Discuss & Create Rationale

Diagnose Student Strengths & Weaknesses

Identify Next Instructional Steps

Quick sort student work without scoring into high, average, and low proficiency groups.



Discuss with colleagues and write rationale for placing student work in each pile.

Diagnose student strengths and needs.

Identify next instructional steps for whole class and/or each level.

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Example: Student Work Analysis



HIGH	AVERAGE	LOW
MV	LJ	LW
SS	NS	DM
AP	AH	
CR	CD	
	JG	
	CT	
	CG	
31% OF CLASS	54% OF CLASS	15% OF CLASS

Compare the students at each level to where they began the year or unit. Discuss the students' progress: Why do you think students are making progress? Why do you think they are not making progress?

All students have shown progress, though some are still on the same level (they have scored higher on the rubric). What I find most concerning is that LW and DM are in the low group. Typically, these students scored high. I am concerned that this topic was rather challenging for them and this tells me remediation is necessary.

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Example: Diagnosing Student Strengths

HIGH	AVERAGE	LOW
<ul style="list-style-type: none"> Understands the difference between mass and weight Takes the concept and applies to other situations Properly records and analyzes data Use data to draw mostly appropriate conclusions Applies conclusion to other situations that were not tested in the lab 	<ul style="list-style-type: none"> Followed lab procedures and properly conducted the lab Minimal confusion with scientific terms such as weight/mass and acceleration Analyzed the data and applied it to the lab scenario but had minor difficulty/confusion when transferring that knowledge to other scenarios 	<ul style="list-style-type: none"> Followed procedures and properly conducted the lab Filled in a data chart that had been created for them Drew basic conclusions about the lab, even if proper vocabulary/terminology was not used

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Example: *Diagnosing Student Needs*

HIGH	AVERAGE	LOW
<ul style="list-style-type: none"> Practice with designing experiments on their own, instead of following the procedures of one designed for them Practice with the formulas used especially with more technical word problems 	<ul style="list-style-type: none"> Practice reading charts/graphs in order to analyze data Review of vocabulary associated with the concept Practice with the application of skills and concepts, while transferring the knowledge to other scenarios 	<ul style="list-style-type: none"> Create own data charts ensuring ability to determine which data they are collecting and what the best method of recording Vocabulary terms associated with this concept Reading charts/tables and analyzing data

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Warm-Up Revisited

Which of these examples represent a formative assessment and why?

- Teachers analyze student math tests to evaluate the quality of their math curriculum.
- A school tests students every 12 weeks to predict which students are “on track” to score proficient on the end-of-year state test.
- Exit ticket question after a lesson: “What is the difference between mass and weight?”
- Teacher instructs students to use white boards to “Sketch the graph of $y=2x + 5$. Then turn and talk to explain your thinking to your elbow partner.”

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Micro-Course 3 Outline

Module 1

- Accelerating Learning: Supporting high-quality formative assessments in the classroom

Module 2

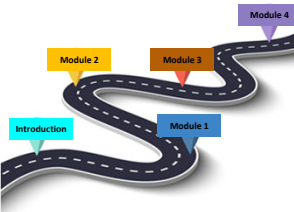
- Accelerating Learning: High-quality discussions between school leaders and teachers about formative assessment processes

Module 3

- Accelerating Learning: Supporting teachers as they create or select formative assessments during or after instruction

Module 4

- Accelerating Learning: Supporting teachers as they involve students and their peers in the formative assessment process



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Reflection Questions

1. Describe how teachers can engineer effective discussions, tasks, and activities to elicit evidence of student learning before, during, and after instruction.
2. Explain how creating strategic questions as part of the formative assessment process allows the teacher to make instructional decisions and plan for differentiation.
3. Review the planned formative assessment questions or assignments for a teacher's unit - do they make all students' thinking visible and provide actionable information? Explain how the teacher can revise the questions/activities, if they do not.
4. Engage in the *Student Work Analysis Protocol* with teachers during a PLC or team or department meeting. How are teachers diagnosing students' strengths and needs, and discussing instructional next steps? What did you learn about the formative assessments used in the classrooms?
5. What is one key takeaway and one lingering question you have after listening to this module?

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