The Formative Assessment Process

Planning

On-going Analysis of Instruction and Learning

Learning Target Use

Instructional & Learning Decisions

Eliciting Evidence of Student Learning

Formative Feedback

Student

Formative Assessment Guiding Questions:

- Where are we going?
- What does the student understand now?
- How do we get to the learning target?

Increased Student Motivation and Learning
Element 2.2—Learning Progressions

Definition
Learning progressions have been defined as the typical developmental sequence of skills and knowledge in a subject area over a span of time, based on research-conjectured hypotheses and validation studies. A learning progression describes the path of student learning in a subject matter domain leading to increased sophistication in student understanding. There are variations in the learning progressions that have been developed, however. Different types of learning progressions can be useful for different purposes. For example, learning progressions vary in the level of detail, the grade level focus, and the extent of the progressions. While some types of learning progressions can inform standards and large-scale assessments, other types may be more helpful for teachers to support day-to-day student learning in the classroom (Alonzo & Steedle, 2009; Gotwals, 2012, 2018; Lehrer & Schauble, 2015). Specifically, it is important for teachers to consider the scope of the learning progression to clarify the amount of content and instructional time. In addition, the grain size of the learning progression, or the level of detail about the incremental changes in student thinking, is key to support student learning in the classroom (Alonzo, 2012; Mohan & Plummer, 2012).

Teacher’s Instructional Practices
One way teachers can develop learning progressions is to describe a series of incremental changes that occur in a student’s thinking and skills. These changes lead from achievement of a standard to the next in a subject matter domain. Along this path, there is a typical sequence of learning where the concepts or skills develop and deepen over time.

College and career ready standards are substantive and too big for daily lesson planning. To plan for instruction and the formative assessment process, teachers need to describe the intermediate steps that occur in each student's thinking and ability as he or she advances in his or her learning from one standard to the next. These steps or series of changes can be thought of as “Building Blocks” (Tobiason, Chang, Heritage, & Jones, 2014). To identify a building block, a teacher can think about the learning steps that a student needs to take along a path to achieve a standard. Then, the teacher can use each building block to develop the related learning target(s) and success criteria. Together the building blocks, or learning steps, can be a form of a learning progression.
How do building blocks make up a learning progression?

Building blocks should connect to each other. They form a connected progression, not discrete or isolated instances of learning. Table 3 shows an example of a series of building blocks for a third grade mathematics standard developed by Tobiason, Chang, Heritage, & Jones, (2014, p. 20). The table also includes the associated learning target and success criteria.

Standard: CCSS Math Content 3. OA: Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 × 7.

**Table 3: Building Block Example**

<table>
<thead>
<tr>
<th>Building Blocks of the Standard</th>
<th>Learning Target</th>
<th>Success Criteria</th>
</tr>
</thead>
</table>
| **Block 1**                    | Understand that a row in an array tells how many in the group and the column tells how many groups. | • Count the number in a group and the number of groups.  
• Explain what happens when one more row and one more column are added to the array. |
| Practice repeated addition of objects arranged in rectangular arrays with progressively more rows and columns (beyond 5 rows and 5 columns).  
EX 7+7+7+7 and 2+2+2+2+2+2+2 | | |
| **Block 2**                    | Understand that repeated addition can be represented with a number sentence or with a concrete representation (e.g., manipulatives arranged in an array). | • Write a number sentence from a given concrete representation of repeated addition.  
• Explain the correspondence between their number sentence and the given representation.  
• Correctly model a given number sentence about repeated addition with a concrete representation.  
• Explain the correspondence between their concrete representation and the given number sentence. |
| Move between symbolic (2+2+2+2) and concrete (four groups of 2 objects) representations of the same repeated addition number sentence. | | |
| **Block 3**                    | Recognize the structure of repeated addition and understand that repeated addition can be expressed as the number of times a number repeats. | • Create accurate number sentences using repeated addition, from a given set of objects.  
• Make a pictorial representation of their number sentence.  
• Describe the number of repeats in a concrete representation (e.g., “I have 6 repeats of this set of 3 things”).  
• Correctly and precisely use the vocabulary “times” to express the number of repeats. |
| Describe repeated addition like 7+7+7+7 as “the number 7, added four times,” and then, “four times 2.” | | |

*See the cited reference for the complete list of building blocks for this standard.*
Below is an example of a series of building blocks for a third grade ELA standard developed by Lozano, Mancevice, Jones, Heritage, Chang, & Tobaison (2013, p. 31):

Standard: CCSS RL.3.6: Distinguish their point of view from that of the narrator or those of the characters.

**Table 4: Building Block Example**

<table>
<thead>
<tr>
<th>Building Blocks of the Standard</th>
<th>Learning Target</th>
<th>Success Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Block 1</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recognize that characters and</td>
<td>Understand that</td>
<td>• I can identify and characterize the</td>
</tr>
<tr>
<td>narrator can express themselves</td>
<td>the characters and</td>
<td>narrator’s and different characters’</td>
</tr>
<tr>
<td>through different language</td>
<td>the narrator have</td>
<td>language styles.</td>
</tr>
<tr>
<td>styles.</td>
<td>unique language</td>
<td>• I can explain how the narrator’s</td>
</tr>
<tr>
<td></td>
<td>styles.</td>
<td>and characters’ language styles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>are different from one another.</td>
</tr>
<tr>
<td><strong>Block 2</strong></td>
<td>Understand</td>
<td>• I can state a character’s point of</td>
</tr>
<tr>
<td></td>
<td>characters’ points</td>
<td>view based on what he/she says</td>
</tr>
<tr>
<td></td>
<td>of view based on</td>
<td>and the tone of his/her tone.</td>
</tr>
<tr>
<td></td>
<td>what they say,</td>
<td>• I can use evidence from the text</td>
</tr>
<tr>
<td></td>
<td>the tone they use,</td>
<td>to support my explanation of a</td>
</tr>
<tr>
<td></td>
<td>and what they do.</td>
<td>character’s point of view.</td>
</tr>
<tr>
<td><strong>Block 3</strong></td>
<td>Understand a character’s</td>
<td>• I can explain what a character’s</td>
</tr>
<tr>
<td></td>
<td>point of view in</td>
<td>point of view is.</td>
</tr>
<tr>
<td></td>
<td>relation to a moral</td>
<td>• I can explain how this point</td>
</tr>
<tr>
<td></td>
<td>dilemma in the story.</td>
<td>of view connects to the moral</td>
</tr>
<tr>
<td></td>
<td></td>
<td>dilemma in the story.</td>
</tr>
</tbody>
</table>

*See the cited reference for the complete list of building blocks for this standard.

The examples above should be seen as examples, rather than the one set of building blocks for each standard for all students in a classroom. Teachers may develop slightly different building blocks for a standard as needed by students at different levels of understanding.

The building blocks can be used to determine lesson-sized “chunks” of learning so that students’ thinking and/or skills develop over time on the way to meeting a standard. When teachers clarify the learning progression by outlining the building blocks necessary to achieve a standard, teachers are better equipped to determine the associated learning targets and success criteria for instruction and formative assessment. In addition, students will better understand how their learning may progress. Teachers also are better prepared to address misconceptions in student understanding—an important part of the formative assessment process. Learning progressions can be critical for teachers in the formative assessment process to identify what to do next with instruction after gathering evidence of student understanding, and what feedback to give students to move them toward the learning target.
Not all students follow the same path
Learning progressions describe “typical” learning paths. There can be outliers, and different ways in which students progress. There is not one path that all students will always follow in their learning. In addition, learning progressions are not developmentally inevitable; they depend upon quality teaching and quality learning experiences.

The teacher will need to make allowances for the fact that all students in a classroom may not be on the same path. Research has shown that some students can accomplish an intended learning target in the manner in which the teacher planned and provided instruction, achieving each planned building block. Other students may achieve the learning target without having achieved each planned building block, since they followed a different path in their learning. In addition, some students will move along the path more quickly than others. Formative assessment is key for the teacher to know where students are in relation to the learning target.

Awareness of learning progressions also helps the teacher to understand how to connect the learning target for a given lesson to previous and future learning. When the teacher thinks of learning targets for a lesson as part of a broader trajectory of learning and presents this sequence to students, it helps to communicate the purpose to students of why they are learning this particular knowledge and skill, at this particular time, in this particular way. Teachers can clarify to students how this learning will build on past learning toward a broader learning goal. For example, a teacher may say, “We are learning about how maps provide information about direction, location, and distance. In our previous lessons, we examined the different features of a map including the key, symbols, the title, scale, and the north arrow. Today you will be able to draw a map of our school including the key features. These skills will help you in future lessons as we learn how to use the map to provide directions for another student and calculate distance from one location to another.”

Learning progressions are an important tool in the formative assessment process to help teachers and students connect prior knowledge to new learning as they move from less sophisticated to more sophisticated understandings. The teacher asks, “What steps do students need to make along the path of learning this standard?” A guiding question for the student is, “Now that I know X, what do I need to learn next to achieve the standard?” Due to differences in students’ prior knowledge, experience, and skill, there will be differences as they work through these changes in understanding from the end of one standard to the next. Thus, students may take different amounts of time as they progress in their learning along the path.
Figure 6 below outlines the four stages teachers may work through as they develop their expertise with learning progressions related to the formative assessment process.

**Figure 6: Four Stages of Instruction Involving Learning Progressions Related to the Formative Assessment Process**

1. At the beginning stage, the teacher does not connect learning targets to past or future learning. The learning path may not be known or acknowledged with students.

2. At the next stage, the teacher mentions past or future learning targets, but they are not clearly connected to the current learning targets. The learning path may be unclear to students.

3. At the third stage, the teacher makes some effort to explain to students how current learning targets follow past learning targets to build toward achievement of a content standard. A general description of the learning path is presented to students.

4. At the fourth stage, the teacher explicitly connects learning targets to past and future learning, reflecting the path of learning toward achievement of a content standard. The students understand how the current lesson fits within a sequence of learning and contributes to a broader purpose for the learning.

**Moving from One Stage to the Next**

For a teacher to move from one stage to the next in the Four Stages of Instruction Involving Learning Progressions outlined above, he or she will need to develop proficiency with making meaningful connections between the learning that comes before and after a given learning target (and become sensitive to the different paths that some students may follow to achieve the target). This understanding is based on deep content knowledge and clarifying a series of building blocks that lead students from one standard to achievement of the next standard. The teacher will explain how the current targets follow past learning targets in a way that contributes to a broader learning goal. For example, a teacher may indicate that students previously learned about the parts of a plant in preparation for learning about photosynthesis.

"A learning progression is a carefully sequenced set of building blocks that students must master en route to mastering a curricular aim."

— W. James Popham
The teacher will help the student to understand how the current lesson is part of a coherent sequence of learning that leads to future learning goals. In addition, teachers will draw on their knowledge of learning paths in both their planning and instruction to develop a series of lessons that build upon each other toward greater student competence.

With a well-developed understanding of learning progressions, a teacher is able to explain how the past, current, and future lessons are connected. The teacher is able to facilitate student discussion so that students understand how a learning target for a lesson is connected to past and future learning and contributes to a broader purpose for learning. This element of the formative assessment process focuses more on understanding that learning targets are chunks of learning that are connected to achieving a content standard. The teacher helps to make these connections for students as one way to help them take on greater ownership and become more active partners in their learning.

In speaking about formative assessment, two prominent researchers stated: “One requirement for such an approach is a sound model of students’ progressions in the learning of the subject matter, so that the criteria that guide the formative strategy can be matched to students’ trajectories of learning (Black & Wiliam, 1998, p. 37). As teachers develop their practice regarding learning progressions, it is helpful to work in collaboration with each other. Teachers may initially draw on existing resources on learning progressions as a reference to support their work. Some learning progressions have been developed, but there are not enough available for every standard. Therefore, teachers will need to think about the progression of learning for individual standards in their specific content area. It is recommended to focus initially on select standards and to gradually build up the work over time. This is an iterative process in which teachers can experiment with new ideas and make adjustments and changes over time.

Below is a list of resources for further information on Building Blocks. These are the additional resources referenced within the documents.


Formative assessment: An enabler of learning

Formative assessment can be a powerful day-to-day tool for teachers and students. Margaret Heritage explains

FORMATIVE ASSESSMENT is often misconstrued. Routinely, it is conceptualized as a "test" or an "instrument" that is more fine-grained and administered more frequently than other types of assessment. This formulation misses its documented power for improving student learning. When formative assessment is conceived as a practice implemented by teachers, in collaboration with their students, then its promise as an enabler rather than an evaluator of learning can be realized.

The essential purpose of formative assessment as a practice is to move students’ learning forward while their learning is still in the process of developing. This stands in contrast to other forms of assessment, which evaluate learning after a period of teaching. Formative assessment practice operates as a feedback loop in which both teachers and students can play active, distinctive, yet complementary roles in enabling learning by consistently working to build and consolidate student understanding and skills during the course of a lesson.

The teacher’s role

Formative assessment is only effective when teachers are clear about the intended learning goals for a lesson. This means focusing on what students will learn, as opposed to what they will do, which is often where teachers are tempted to start. To achieve maximum transparency for students, teachers share the learning goal, or actively create it with students, at the beginning of the lesson. In addition, teachers communicate the indicators of progress toward the learning goal or determine them in collaboration with the students. These indicators serve as signposts for both teachers and students about progress during the lesson.

With clarity about the goal and indicators, teachers can then decide how they will gather evidence of emergent learning. There is no single way to collect formative evidence because formative assessment is not a specific kind of test. For example, teachers can gather evidence through interactions with students, observations of their tasks and activities, or analysis of their work products. However, there are two important points about evidence collection. First, whatever method teachers use to elicit evidence of learning, it should yield information that is actionable to them and their students. Second, evidence collection is a systematic process and needs to be planned so that teachers have a constant stream of information tied to indicators of progress. At the same time, of course, teachers will also be collecting evidence "on-the-fly" — those unplanned, spontaneous moments when students do or say something that give an indication of where they are in relation to the lesson goal.

Feedback

Feedback is a crucial component of formative assessment, and has two aspects. First, feedback obtained from planned or spontaneous evidence is an essential resource for teachers to shape new learning through adjustments in their instruction. If teachers use evidence effectively to inform their instruction, it will render previous assessment information out of date: student learning will have progressed and will need to be assessed again. Instruction can again be adjusted to make sure that learning is on track. For this reason, a constant stream of evidence from formative assessment is necessary during lessons.

Second, feedback that the teacher provides to students is also an essential resource so the students can take active steps to advance their own learning. In reality, the feedback to students can be understood as instructional action. As the extensive literature on feedback suggests, teacher feedback is most beneficial when it assists students to understand their current learning status and provides hints, suggestions, or cues for them to act on. It is this, rather than offering general praise or total solutions, that enables students to assume a degree of responsibility for their learning.

The teacher’s role also involves helping students develop the skills to make metacognitive judgments about their learning in relation to the goal being aimed for, and to establish a repertoire of strategies to regulate their own learning.

The students’ role

The students’ role in formative assessment begins when they have a clear conception of the learning target. Just as the teacher
Overall, the feedback loop is fueled by three convergent sources of feedback: from teachers, peers, and the students themselves. However, the successful provision and use of this feedback is dependent on the nature of the classroom climate in which the learning is taking place.

**Classroom climate**
An essential aspect of formative assessment is classroom climate. Three particular elements are key: first, power and responsibility in the classroom is not just the teacher’s prerogative, but is distributed so that teachers and students work together to share responsibility for learning. Second, the classroom has to be a safe place: students must be able to ask for help, regard errors as sources of new learning, and admit difficulties or problems without fear that these actions will diminish them in the eyes of their teachers or their peers. Instead, they need to know that such behaviors are desirable and are characteristic of effective learners. Finally, it means that the relationships in the classroom must be supportive and collaborative, characterized by mutual trust among teachers and students.

**Conclusion**
The important thing about formative assessment is that it is not a test, nor an instrument, but rather an approach to teaching and learning that uses feedback as its centrepiece in a supportive classroom context. Formative assessment is a practice that empowers teachers and students to give their best to enable learning. In the end, the success of formative assessment as an enabler of learning depends on the knowledge and skills of teachers to implement this approach in collaboration with their students, not on test developers.

**About the author**
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**Further reading**

Formative Assessment: What Do Teachers Need to Know and Do?

To many of today’s teachers, assessment is synonymous with high-stakes standardized tests. But there is an entirely different kind of assessment that can actually transform both teaching and learning. Ms. Heritage describes what the skillful use of formative assessment would look like.

By Margaret Heritage

FORMATIVE assessment, if used effectively, can provide teachers and their students with the information they need to move learning forward. But after more than a hundred years of exhortations and a significant body of research on the topic, the idea that assessment and teaching are reciprocal activities is still not firmly situated in the practice of educators. Instead, assessment is often viewed as something in competition with teaching, rather than as an integral part of teaching and learning.

In our current accountability environment, assessment is not regarded as a source of information that can be used during instruction. Instead, it has become a tool solely for summarizing what students have learned and for ranking students and schools. In the process, the reciprocal relationship between teaching and assessment has been lost from sight. In a context in which assessment is overwhelmingly identified with the competitive evaluation of schools, teachers, and students, it is scarcely surprising that classroom teachers identify assessment as something external to their everyday practice.

Educators recognize that annual state tests provide too little information that arrives too late for planning instruction, and this has prompted districts and schools to supplement state assessments with interim or benchmark assessments. These typically consist of item banks, administration tools, and customized reports, and they usually are administered uniformly to all students three to four times a year. Their greater frequency notwithstanding, these assessments still do not provide teachers with information they can use for ongoing instruction. Despite the enthusiasm for these assessments at the district level and the considerable resources that are being expended on them, the fact remains that they cover too long a period of instruction and provide too little detail for effective use in ongoing instructional planning. At best, they function more as snapshots of student progress and as predictors of student performance on the end-of-year, statewide tests. Indeed, Dylan Wiliam and Marnie Thompson suggest that they might better be described as “early warning summative” tools rather than as tools that can be formative to instruction.

Furthermore, teachers do not control how or when these tests occur, what the purpose of the assessment is, or who

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is assessed. Yet these are the assessments that “count,” even though they offer little help to teachers in their daily practice.

Compounding these difficulties is the fact that assessment has traditionally not been a focus of preservice and in-service courses. As Richard Stiggins laments, U.S. educators are “a national faculty unschooled in the principles of sound assessment.” Teachers learn how to teach without learning much about how to assess. Moreover, their administrators also lack training in assessment and therefore do not have the skills to support the development of assessment competencies.

What is missing in assessment practice in this country is the recognition that, to be valuable for instructional planning, assessment needs to be a moving picture—a video stream rather than a periodic snapshot. If assessment is used to inform effective instruction, then that assessment is quickly rendered out of date. Student learning will have progressed and will need to be assessed again so that instruction can be planned to extend the students’ new growth.

Formative assessment practices, if implemented effectively, can provide teachers and their students with the data that they need. Moreover, there is empirical evidence that formative assessment, unlike benchmark assessments, is effective in improving student achievement. However, in a profession that already feels burdened by the amount of assessment, there is a danger that teachers will see formative assessment as yet another external demand that takes time away from teaching.

WHAT IS FORMATIVE ASSESSMENT?

Formative assessment is a systematic process to continuously gather evidence about learning. The data are used to identify a student’s current level of learning and to adapt lessons to help the student reach the desired learning goal. In formative assessment, students are active participants with their teachers, sharing learning goals and understanding how their learning is progressing, what next steps they need to take, and how to take them.

Formative assessment involves a variety of strategies for evidence gathering, which can be categorized into three broad types: on-the-fly assessment, planned-for interaction, and curriculum-embedded assessment.

On-the-fly assessment. On-the-fly assessment occurs spontaneously during the course of a lesson. For example, a teacher listening to group discussions hears students expressing misconceptions about the science concept she has been teaching. She then changes the direction of her lesson to provide a quick “pop-up” lesson. The pop-up lesson enables the teacher to clear up the misconceptions before proceeding with her planned instructional sequence.

Planned-for interaction. In planned-for interaction, teachers decide beforehand how they will elicit students’ thinking during the course of instruction. For example, teachers plan the questions they will ask during the course of the lesson in order to enable students to explore ideas, and these questions can elicit valuable assessment information.

Curriculum-embedded assessments. There are two kinds of curriculum-embedded assessments, those that teachers and curriculum developers embed in the ongoing curriculum to solicit feedback at key points in a learning sequence and those that are part of ongoing classroom activities. For example, student mathematical representations created during lessons can function as formative assessments, as can students’ science notebooks that are also part of students’ regular classroom activity.

ELEMENTS OF FORMATIVE ASSESSMENT

There are four core elements of formative assessment: 1) identifying the “gap,” 2) feedback, 3) student involvement, and 4) learning progressions. Teachers need to have a clear understanding of each of these elements.

Identifying the gap. In a seminal paper in 1989, Royce Sadler established the essential purpose of formative assessment as the means to identify the gap between a student’s current status in learning and some desired educational goal. He stressed that this gap will vary from student to student and spelled out the consequence for pedagogy: “If the gap is perceived as too large by a student, the goal may be unattainable, resulting in a sense of failure and discouragement on the part of the student. Similarly, if the gap is perceived as too ‘small,’ closing it might not be worth any individual effort. Hence, to borrow from Goldilocks, formative assessment is a process that needs to identify the ‘just right gap.’”

Educational psychologists call this “just right gap” the zone of proximal development (ZPD). Originating with Lev Vygotsky’s still-influential formulation, the ZPD is defined as the distance between what the child can accomplish during independent problem solving and the level of problem solving that can be accomplished under the guidance of an adult or in collaboration with a more expert peer. The teacher’s task is to identify and build on immature but maturing structures and, through collaboration and guidance, to fa-
cilitate cognitive growth. In the process, the child internalizes the resources required for solving a particular problem, and these resources become part of the child's independent developmental achievement. The term "scaffolding" characterizes the support that adults give to learners in the ZPD to move them from what they already know to what they can do next. Effective formative assessments, then, should identify what a student might achieve in his or her ZPD and enable teachers to adapt teaching to close the gap between the student's current state of learning and the desired state.

Feedback. Formative assessment is designed to provide feedback at multiple levels. First, it provides feedback to the teacher about current levels of student understanding. This feedback also informs what the next steps in learning should be.

Feedback also is central to guiding students through their own next steps. Sadler's model strongly emphasizes feedback to students through the use of the feedback loop. This loop involves teachers and their students in an ongoing process. Effective feedback from teachers provides clear, descriptive, criterion-based information that indicates to the students where they are in a learning progression (defined below), how their understanding differs from the desired learning goal, and how they can move forward. The teacher takes steps to close the gap between the students' current learning and the goal by modifying instruction, assessing again to give further information about learning, modifying instruction again, and so on. In formative assessment, learners must be able to use feedback to improve their learning. Another important aspect of the relationship between feedback and learning is that feedback has a strong effect on students' motivation and their sense of self-efficacy — how they feel about their various abilities — both of which are major influences on learning.

Student involvement. Improving learning through formative assessment also depends on the active involvement of students in their own assessment. In formative assessment, students learn the skills of self- and peer assessment so that, as Sadler suggests, they collaborate with their teachers in developing a shared understanding of their current learning status and what they need to do to move forward in their learning. In doing so, they are using metacognitive processes. They reflect on their learning, monitoring what they know and understand and determining when they need more information. They also develop self-regulation strategies and are able to adapt their learning tactics to meet their own learning needs. Students must also collaborate with their teachers to determine the criteria for success for each step along the learning progression.

Learning progressions. If formative assessment is to provide guidance to teachers and students, it must be linked to a learning progression. The learning progression should clearly articulate the subgoals that constitute progress toward the ultimate goal. Most state standards, by themselves, do not provide a clear progression for understanding where students are relative to desired goals. In fact, many state standards do not even provide a clear picture of what learning is expected. Developing learning progressions toward standards is a critical element of formative assessment. Learning progressions provide the big picture of what is to be learned, and they help teachers locate students' current learning status on the continuum along which students are expected to progress.

Students also need to have short-term goals, which are derived from the learning progression and described in terms of success criteria. Success criteria are the guide to learning while the student is engaged in the learning tasks. The success criteria provide the framework within which formative assessment takes place and make possible the interpretation of evidence.

THE KNOWLEDGE TEACHERS NEED

To use formative assessment successfully in the classroom, teachers need specific knowledge and skills. Four basic elements of teacher knowledge are critical: 1) domain knowledge, 2) pedagogical content knowledge, 3) knowledge of students' previous learning, and 4) knowledge of assessment.

Domain knowledge. Teachers must know the concepts, knowledge, and skills to be taught within a domain, the precursors necessary for students to acquire them, and what a successful performance in each looks like. With this knowledge, they are able to define a learning progression of subgoals toward the desired learning that will act as the framework to guide assessment and instruction. A sufficiently detailed progression will also supply the success criteria for recognizing when students have demonstrated a successful performance and when they have not and for providing students with substantive feedback.

Most state standards, by themselves, do not provide a clear progression for understanding where students are relative to desired goals.
Teachers also need to understand student metacognition as it relates to assessment. As noted earlier, students develop the ability to monitor and assess their own learning so that they recognize when they are learning and when they are not. Linked to self-assessment is self-regulation, the will to act in ways that result in learning. And when students recognize they are not learning, they have the strategies to do something about it. Finally, teachers need to know that students’ motivational beliefs — for example, beliefs about their general level of competence or self-efficacy — may influence their learning.14

Pedagogical content knowledge. To effectively adapt instruction to student learning, teachers’ pedagogical content knowledge must include familiarity with multiple models of teaching for student achievement in a specific domain and knowledge of which model of teaching is appropriate for what purpose. As already noted, the gap between current status and learning goals will differ from student to student, so teachers will need differentiated instructional strategies and a knowledge of how to use them in the classroom. To support student self-assessment, teachers will also need to be familiar with multiple models of teaching metacognitive processes and self-assessment skills.

Students’ previous learning. If teachers are to build on students’ previous learning, they need to know what that previous learning is. Students’ previous learning includes: 1) their level of knowledge in a specific content area, 2) their understanding of concepts in the content area (i.e., the degree to which they can make generalizations through a process of abstraction from a number of discrete examples), 3) the level of their skills specific to the content area (i.e., the capacity or competence to perform a task), 4) the attitudes the students are developing (e.g., the value the students place on the subject, the interest they display, and their levels of initiative and self-reliance), and 5) their level of language proficiency.

Assessment knowledge. Teachers must know about the range of formative assessment strategies so that they can maximize the opportunities for gathering evidence. In addition, even though formative assessment strategies will not always meet accepted standards of validity and reliability, teachers need to understand that the quality of the assessment is an important concern. The overriding issue is consequential validity. Because the purpose of formative assessment is to promote further learning, its validity hinges on how effectively learning takes place in subsequent instruction. Teachers also need to know how to align formative assessments with instructional goals, and they need to ensure that the...
evidence from the formative assessment and the inferences they draw from it are sufficient quality to enable them to understand where the learner is along a learning progression. Finally, teachers need to know that their own assessments of learning are not the only available sources of evidence; students’ self- and peer assessments provide important opportunities for establishing their current learning status.

THE SKILLS TEACHERS NEED

In addition to an appropriate knowledge base, the successful implementation of formative assessment requires specific teacher skills. Teachers need to be able to 1) create classroom conditions that allow for successful assessment, 2) teach the students to assess their own learning and the learning of others, 3) interpret the evidence, and 4) match their instruction to the gap.

Creating the conditions. If students are going to be involved in assessment, two things need to happen. First, teachers must create a classroom culture that supports self- and peer assessment. This means that the classroom is a place where all students feel that they are respected and valued and that they have an important contribution to make. Second, teachers must have the skills to build a community of learners, characterized by a recognition and appreciation of individual differences. Classroom norms of listening respectfully to one another, responding positively and constructively, and appreciating the different skill levels among peers will enable all students to feel safe in the learning environment and to learn with and from one another. Above all, teachers will need the skills to model the “safety” norms of the classroom in their own behavior.

Student self-assessment. Teachers must teach students to assess their own learning and the learning of others. This involves helping students to set goals and criteria for success, to reflect on their own and others’ understanding, and to evaluate learning according to the criteria. Strategies to involve students in self-assessment can be as simple as asking students to reflect on their performance through such questions as “Do you think that your response demonstrated understanding? If so, why do you think this? If not, why do you think you did not demonstrate understanding?” From this basis, students can learn to be more independent and can recognize when they do not understand, when they need to do something about it, and what they can do to improve.

Teacher skills also include helping students learn to give constructive feedback to their peers that can provide for future growth. From simple beginnings like saying, “It wasn’t clear to me when . . .” or “I didn’t understand your point about . . .,” students can progress to a detailed analysis of their peers’ performance against specific criteria. Once again, the teacher must model all of this in the classroom so that students see that they are collaborators with their teacher and peers in developing a shared understanding of their current learning status and what they need to do to move forward.

Interpreting evidence. Teachers’ skills in drawing inferences from students’ responses are crucial to the effectiveness of formative assessment. No matter what the assessment strategy — observation, dialogue, asking for a demonstration or a written response — teachers must examine students’ responses from the perspective of what they show about their conceptions, misconceptions, skills, and knowledge. This involves a careful analysis of the responses in relation to the criteria for success. In essence, teachers need to infer what the “just right gap” is between the current learning and desired goals, identifying students’ emerging understanding or skills so that they can build on these by modifying instruction to facilitate growth.

The analysis of student responses takes place in different time frames, depending on the method of assessment. In on-the-fly assessments, teachers have to make inferences on a moment-by-moment basis. A curriculum-embedded analysis of student work might take place after the lesson and will provide more time for close examination. In both instances the importance of domain knowledge to analysis cannot be overstated; the success of the analysis is wholly dependent on it. Without a strong base of domain knowledge there is a danger that teachers’ analyses will focus on the surface aspects of learning at the expense of deeper levels of understanding. An inaccurate analysis of the students’ learning status will lead to errors in what the next instructional steps will be.

The analysis of student responses also provides the substance for feedback to students. Teachers need the skills to translate their analyses into clear and descriptive feedback, matched to the criteria for success, that can be used by students to further their learning.

Matching instruction to the gap. It is axiomatic to formative assessment that, if the next instructional steps to close the gap are too hard for the student, frustration will almost certainly result, and if they are too easy, boredom and disaffection are potential outcomes. Therefore, teachers need the skills to translate their interpretations of the assessment results into instructional actions that are matched to the learning needs of their students. This involves selecting the learning experiences that will place appropriate demands on the student and
ordering these experiences so that each successive element leads the student toward realizing the desired outcome. Having matched the next steps in learning to the gap, teachers' scaffolding skills come into play. Their skills in deciding on the appropriate strategy must be complemented by their skills in executing the strategy. Their job is to ensure that the student receives appropriate support so that new learning is incrementally internalized and ultimately becomes part of the student's independent achievement.

Matching the instruction to the gap cannot be done successfully without differentiating classroom instruction. In any classroom, one student's "just right gap" will not always be the same as another's. Clearly it is not practical for teachers to engage in one-on-one instruction with each student. However, strategic questioning in a whole-class lesson can provide scaffolding for a range of learning levels, while forming subgroups for instruction, assigning individual activities, and employing a combination of didactic and exploratory approaches help accommodate differences.

CONCLUSION

Even if teachers have all the required knowledge and skills for formative assessment, without the appropriate attitudes toward the role that formative assessment can play in teaching and learning, their knowledge and skills will lie dormant.

Teachers must view formative assessment as a worthwhile process that yields valuable and actionable information about students' learning. If they do not, formative assessment will be seen as "yet another thing" that is being externally imposed on them. Teachers must view formative assessment and the teaching process as inseparable and must recognize that one cannot happen without the other.

Also, if students are going to be successfully involved in monitoring and assessing their own and their peers' learning, then they need to be regarded by their teachers as partners in learning. This is not an attitude that has traditionally been prevalent in the profession.

If formative assessment is to be an integral part of professional practice, there needs to be a major investment made in teachers. This investment must begin with changes in preservice training. No teacher should exit a professional training program without the knowledge to assess student learning. Furthermore, beginning teachers must have opportunities to develop and practice the skills of assessing before they are responsible for a class of students. Teacher educators have a significant role to play in ensuring that teacher education programs equip their students with the knowledge and skills necessary to integrate teaching and assessment in classroom practice.

The investment in teachers must continue with inservice professional development that involves a commitment by leaders at all levels of the education system. Rather than providing teachers with more tests, leaders at the state, district, and school levels should invest in a coordinated effort to establish structures and provide resources that support effective professional development.

This investment is a long-term project that should not be shortchanged. The payoff will be improved teacher practices and improved student learning, and that is surely worth it.

12. Ibid.
What do we mean by Formative Assessment?

The Assessment Learning Network (ALN) will use a definition of formative assessment from the Council of Chief State School Officers (CCSSO). This definition is also used by the Michigan Department of Education (MDE) in its Formative Assessment for Michigan Educators (FAME) professional learning program. That definition is:

"Formative assessment is a process used by teachers and students during instruction that provides feedback to adjust ongoing teaching and learning to improve students' achievement of intended instructional outcomes." (CCSSO SCASS, 2007)

This definition of formative assessment comprises several key features:

- The formative assessment process is planned by teachers in advance, so teachers decide when they will check for student understanding and how they will do so; teachers also determine in advance what they will do if students have or have not learned what they have been taught.
- Both teachers and students engage in the formative assessment process.
- The formative assessment process provides immediate feedback to the teacher and to the students.
- Evidence of the students' current level of mastery is used to adjust ongoing Instruction and learning.
- The formative assessment process literally occurs during instruction – in today's class or the next one. (MAC, 2015)

Formative assessment is a process
Black and William (2009) indicate that effective formative assessment practice includes the enactment of the following steps:
- Teachers and students establish a common understanding of a task's learning goals.
- Teachers elicit student thinking.
- Students respond to teachers' elicitation in ways that reveals their thinking.
- Teachers interpret students' responses to make sense of where students are relative to goals for student learning.
- Teachers take action (e.g., trying a new strategy) to move students in the desired direction, on the basis of their interpretation.
- Teachers re-assess to measure the action's success.

Thus, formative assessment is a process, not a "thing." Thus, formative assessments' (a term that actually describes

To learn more

Formative Assessment: What Do Teachers Need to Know and Do?
Margaret Heritage, Kappan. 2007
tinyurl.com/Heritage-Kappan

Formative Assessment: An Enabler of Learning
Margaret Heritage, Better: Evidence-based Education. Spring 2011
tinyurl.com/Heritage-Enabler

Re-Balancing Assessment: Placing Formative and Performance Assessment at the Heart of Learning and Accountability
By Peter Hofman, Bryan Goodwin, and Stuart Kahl
tinyurl.com/re-balancing-assessment

Formative Assessment: What it is and What it is Not!
Sara Bryant, February 2010

Inside the Black Box: Raising Standards Through Classroom Assessment
Paul Black and Dylan William, Kappan, 2010
tinyurl.com/zt8mjuw
interim or benchmark assessments) are not formative. Also, formative assessment is not a test, a quiz, nor an item bank.

**Why use formative assessment?**
Research has shown the use of formative assessment has several positive impacts. It serves to:
- Improve student learning (e.g., Black & William, 1998; Heritage, 2013)
- Increase student involvement (e.g., Brookhart, 2013)
- Help teachers to be more reflective about students’ understandings (Furtak, 2012)
- Support students in identifying barriers to learning (Marshall & Drummond, 2006)

**Three guiding questions in formative assessment**
Research by Sadler (1989), Hattie and Timperley (2007), and Gotwals, et al. (forthcoming) indicate that formative assessment practices may be categorized into three large observable-practice dimensions, structured around key questions that teachers and students should ask themselves as they move through the learning process:
1. **Use of learning targets and goal setting** — Where are we (teacher and students) going?
2. **Evidence of student understanding** — What does the student understand now?
3. **Closing the gap/responding to students** — How do we (teacher and students) get to the learning target?

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**FAME COMPONENTS AND ELEMENTS**
The components and elements to be used in the Formative Assessment for Michigan Educators (FAME) program in 2017 and beyond are a re-conceptualization of the components used previously in FAME. The five components and thirteen elements of the 2017 FAME program are organized by the three guiding questions described. These indicate key steps in the formative assessment process.

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<th>GUIDING QUESTIONS</th>
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<td>Where are we (teacher and students) going?</td>
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<td><strong>LEARNING TARGET USE</strong></td>
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<td>1.1—Instructional Planning: planning based on knowledge of the content, standards, pedagogy, FA process, and students.</td>
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<tr>
<td><strong>ELICITING EVIDENCE OF STUDENT UNDERSTANDING</strong></td>
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<td>3.1—Activating Prior Knowledge: the opportunity for students to self-assess or connect new ideas to their prior knowledge</td>
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<td>3.2—Eliciting Evidence of Student Understanding: use of a variety of tools and strategies to check for understanding of the learning targets from all students</td>
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<tr>
<td>3.3—Teacher Questioning Strategies: the intentional use of questions for students to explain their thinking or to connect their idea to another student’s response</td>
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<td>3.4—Rationale for Questioning, a focus on the purpose, timing, and audience for questions to deliver content and to check students’ understanding</td>
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<td><strong>FORMATIVE FEEDBACK</strong></td>
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<td>4.1—Feedback from the Teacher: verbal or written feedback to a student to improve his or her achievement of the learning target</td>
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<td>4.2—Feedback from Peers: feedback from one student to another student about his or her learning in relation to a learning target</td>
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<td>4.3—Student self-assessment: the process in which students gather information and reflect on their own learning in relation to the learning goal</td>
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<td><strong>INSTRUCTIONAL AND LEARNING DECISIONS</strong></td>
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<td>5.1—Adjustments to Teaching, where teachers daily decide about changes to instruction</td>
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The Michigan Assessment Consortium’s Assessment Learning Network ALN, is a professional learning community consisting of members from MI’s professional education organizations; the goal of the ALN is to increase the assessment literacy of all of Michigan’s professional educators. www.michiganassessmentconsortium.org