Formative Assessment Evidence: Planning for and Responding to Evidence of Learning

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Formative Assessment..

"..active and intentional learning process that partners teachers and students to continuously and systematically gather evidence of learning with the express goal of improving student achievement."

(*Moss & Brookhart, 2009, p. 6)*

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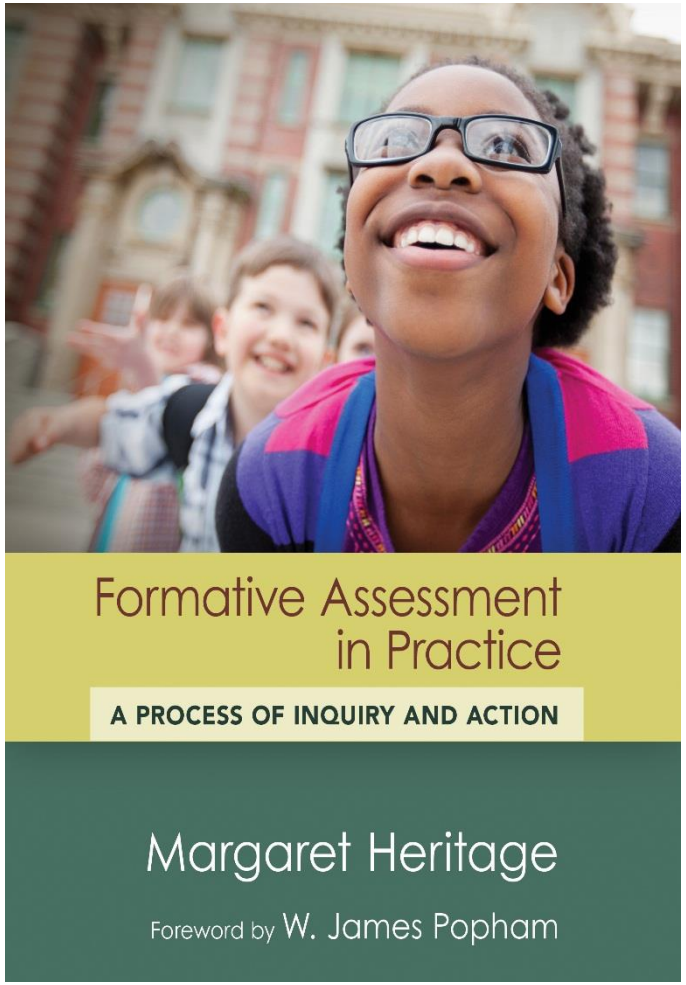
Formative Assessment..



*..a **planned process** that takes place **continuously during the course of teaching and learning** to provide **teachers and students** with **feedback** to **close the gap** between current learning and desired goals.*

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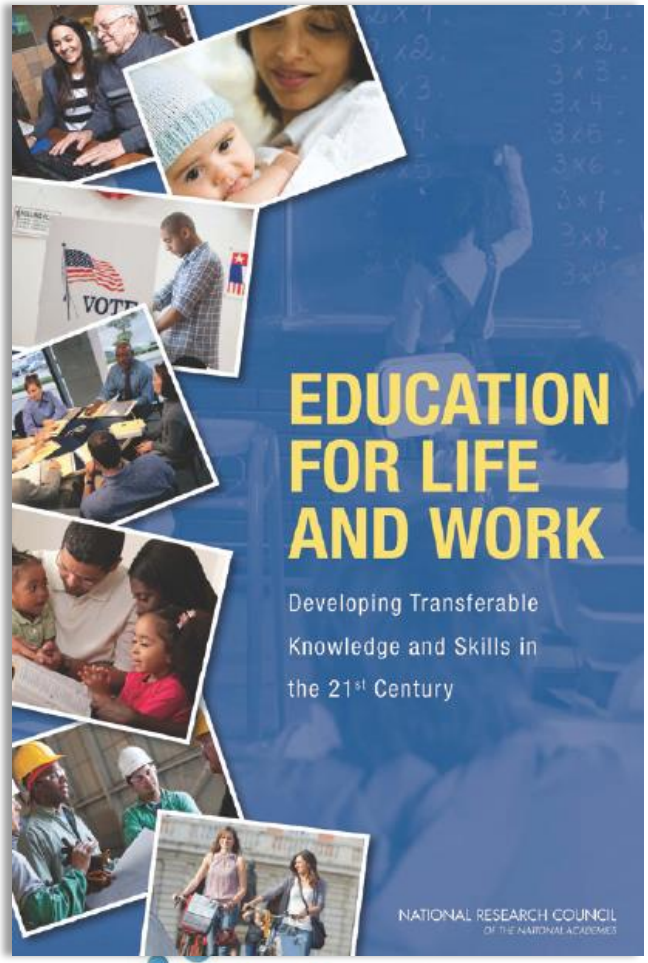
Poll: Do these definitions of formative assessment square with yours?

National Research Council (2012)

Ongoing formative assessment by teachers can provide guidance to students which supports and extends their learning, encouraging deeper learning and the development of transferable competencies (p. 188)



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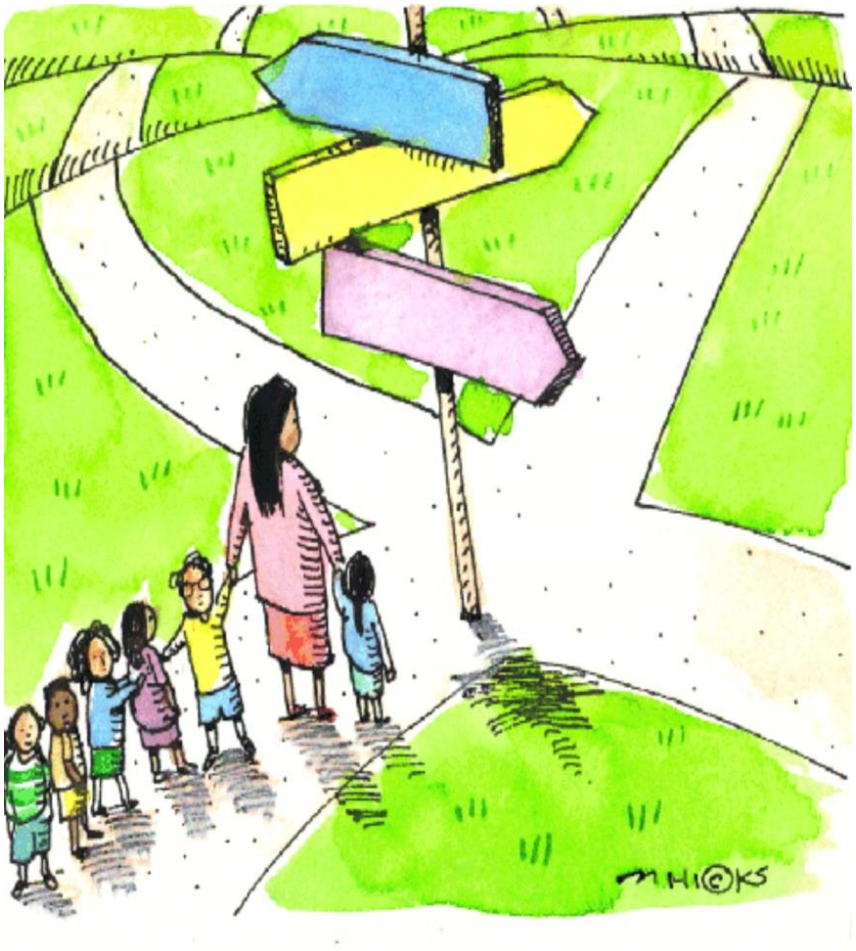
Guiding Questions for Teachers



- Where is the learner going? (in this lesson)
- **Where is the learner now? (in this lesson)**
- Where to next? (in this or the next lesson)
- How to get there?

Evidence Gathering

The overall purpose of evidence gathering in formative assessment is to enable teachers to respond to student learning in order to enhance that learning while the student is in the process of learning

(Bell & Cowie, 2000)

Teachers' careful probing and analysis of student learning, leading to sensitive adjustments to *individual* students' learning

(Pellegrino & Glaser, 1982)

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Evidence Gathering

"I could look at [the students' problem-solving strategies] and see that not all kids were struggling in the same area. I could use that piece of information and see specifically what kids were struggling in what area to intervene on—what they needed instead of reteaching everyone and working, you know, in a whole group setting, and kids who already knew it, or they didn't have that misconception, they weren't getting retaught it…or [I wasn't] teaching something that they didn't need and then it was a quick fix. You know they could meet in small groups, you could meet one-on-one, or you could even have a peer teach them if you had to, but [you can use] that piece to guide your instruction."

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Evidence Gathering

- No single way
- Substantive insights into student learning as it is developing

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Sources of Evidence

Interactions *(Allal, 2010; Black & Wiliam, 2009; Durán, 2013; Harlen, 2007; Heritage & Heritage, 2011, 2013; Jordan & Putz, 2004; Torrance & Pryor, 1998)*

- **Questioning** *(Black & Wiliam, 2005; Chin, 2007; Ginsburg, 2009; Heritage & Heritage, 2011, 2013; Heritage, Silva, & Pierce, 2007; Shavelson et al., 2008)*
- **Assessment Conversations** *(Ruiz-Primo & Furtak, 2006, 2007)*
- **Student Discussions** *(Harlen, 2007)*

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Sources of Evidence

- **Student work products** (e.g., writing, drawings and other artifacts) resulting from well-designed tasks (Harlen, 2007)
- **Embedded-in-the-curriculum** (Shavelson et al., 2008)
- **Technology tools**

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What sources of evidence do you use or have you seen used in the classroom?

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Questioning

- **Initiation**
- **Response**
- **Evaluation**

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Questioning

Can you explain your thinking?

How does this paragraph support the themes?

Do you agree with the point the author makes? Why? Why not?

How are these ideas connected?

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Task and Questioning

After Sorting 20 Quadratic Equations:

Sara, what do you think is similar about $y=3x^2+4$ and $y=3x^2-1$? What would the graphs of these equations look like?

Mike, you put those two equations in different groups. What do you think is different about the two equations?

(Hodgen & William, 2006)

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Responses and Discussion

Which of these statements is true?

A. 0.33 is bigger than 1/3
B. 0.33 is smaller than 1/3
C. 0.33 is equal to 1/3
D. You need more information to be sure

Formativity depends on dialogue and discussion to explore responses

(Hodgen & Wiliam, 2006)

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Representations and Questioning

 Bailey & Heritage, 2008

Formativity of Evidence

(Erickson, 2007)

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Alignment

Alignment between success criteria and evidence gathering strategy:

- **Success criterion**: Students will be able to explain how Abraham Lincoln in his Second Inaugural Address unfolds his examination of the ideas that led to the Civil War
- **Evidence-gathering strategy**: elicit oral or written explanations.

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Tractability

What the evidence reveals that makes it possible for teachers to shape subsequent pedagogical action.

For example:

Questions are targeted to reveal specific misconceptions, prompt accounts of thinking, promote an expanded exchange between teacher and student

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Universalism

Opportunities for **all** students to show where they are in their learning

Capture a range of possible levels of understanding and skills for all the students in the class

Open-ended tasks, discussion, or questioning practices

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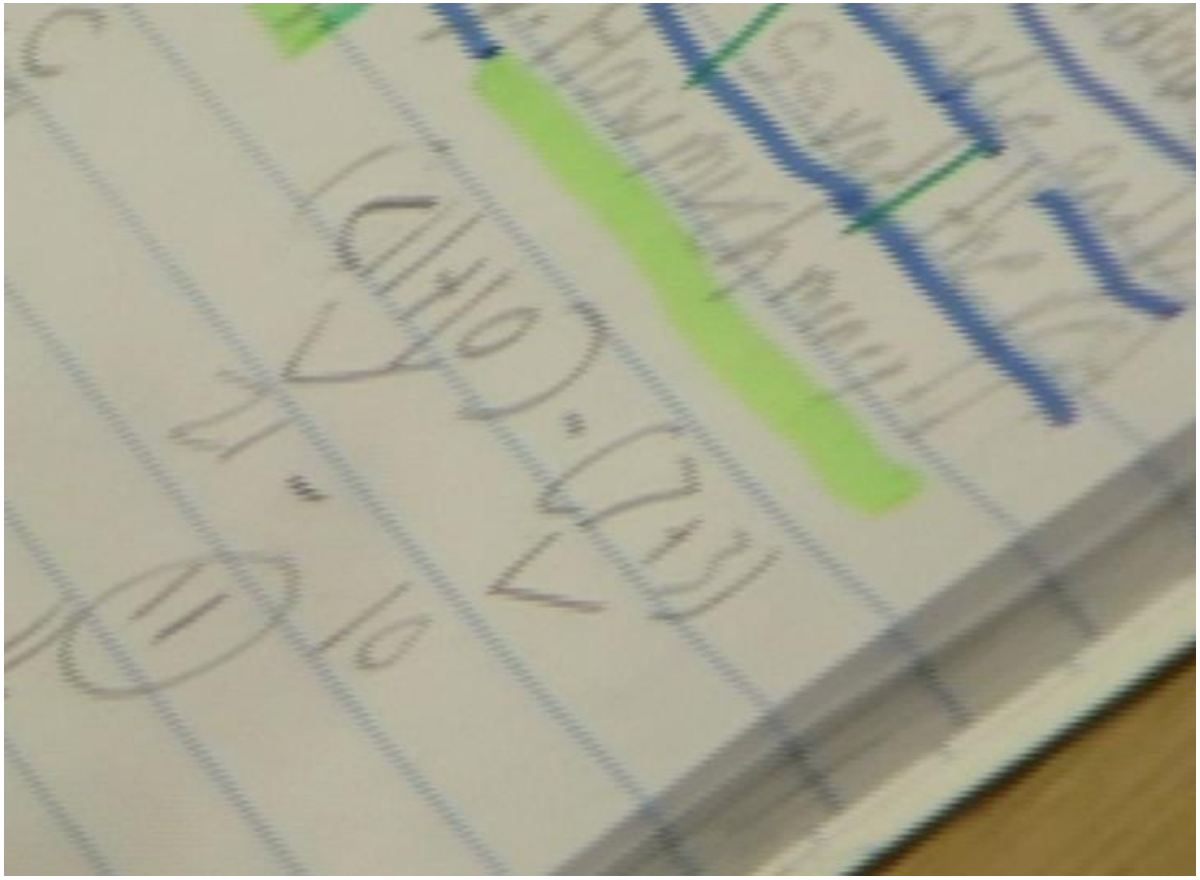
Timing

Proximate to learning so that teachers can take immediate or near-immediate action

Student Work and Questioning



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Interaction

Ms. C: And what was your first step in solving this problem?

Rico: First is to underline questions, clues, and keywords [he has used different color highlights].

Ms. C: Okay.

Rico: (Pointing at paper) These are the questions and the key words and the clues.

Ms. C: Can you go over with me some of the key words you found in this problem?

Rico: I found that she earned, spent, saved, and…

Ms. C: So there were several keywords. There wasn't just one keyword in particular right?

Ms. C: I noticed that you went a step further and you tried to solve this problem (points at paper). I also noticed that you used an expression rather than an equation. Can you—how did you do this? Can you show me how you came to that conclusion of using that expression?

Rico: Well, like, she earned 11 for pulling weeds and 10 for cleaning windows; so if she earned them so I added them because it said that she spent 7 dollars on a movie ticket and 3 for a snack, so I used the math to do this because then I get confused. So I—instead I added the ones that she earned and added the ones that she spent it on, and just to show that—just so I won't get mixed up, I put parentheses because to learn that, umm, that I am going to subtract them.

Ms. C: I see—so you put parentheses around the 11 and the 10, then you put parentheses around 7 plus 3. Right?

Ms. C: Now what's your next step after putting parentheses around?

Rico: To add what's in the—in the open parenthesis and the closed, what's inside of it. I have to add it.

Ms. C: So, your first step was going to be to solve what's inside the parenthesis. Okay. Why don't you go ahead and show us what you came up with.

Rico: I came up with 21 with the 11 plus 10, and 10 is the 7 plus 3, and then since I figured out that the minus was still there (points to the minus between the parentheses), so I put it there (points to the minus between the numerals 21 and 10), and I did 21 minus 10, which gave me 11.

Ms. C: And eleven—is that your final answer?

Rico: Eleven dollars (adds dollar sign to his result).

Interpreting and Responding to Evidence

Responsive Action

"Action is dependent on teachers' knowledge of how learning develops in a domain and on their pedagogical content knowledge."

(Heritage, Kim, Vendlinski, & Herman, 2009. p. 31)

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Why do you think responsive action in formative assessment depends on teachers' content and pedagogical content knowledge?

Please use the chat box to respond.

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Knowledge and Interpretive Skills

In explaining horizontal motion, highly skilled interpretation by teachers noted that the inexperienced physics students typically expressed speed as proportional to the net force acting on the object. Thus, when the object was speeding up the net force was getting larger and larger and when the object was moving with constant velocity the net force was constant. Meanwhile, these teachers also pointed out that at least the students were likely correctly distinguishing between constant speed and speeding up. Teachers with lower levels of interpretation tended only to note that the students were wrong about the net force needed and recited the correct relation between force and motion.

Minstrell et al., 2009

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Instruction

- Continue with the planned lesson
- Instructional response in the moment:
  - *Modeling*
  - *Prompting*
  - *Questioning*
  - *Telling*
  - *Explaining*
- Inform next lesson

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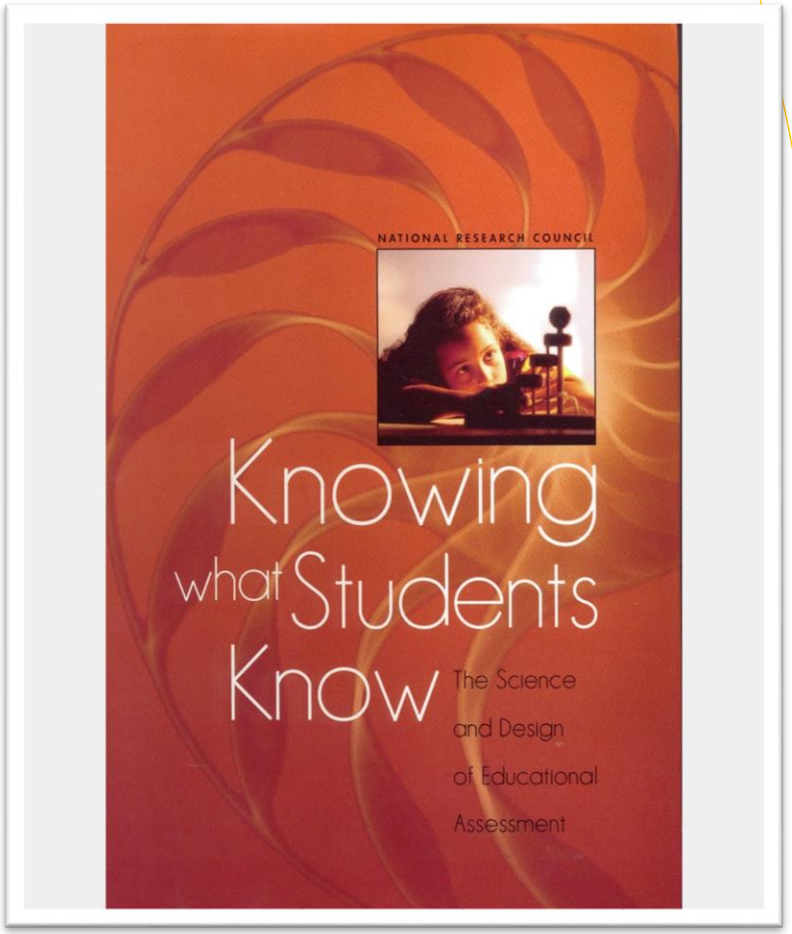
Feedback

"One of the most important roles in assessment is the provision of timely and informative feedback to students during instruction and learning…"

(NRC, 2001, p. 87)



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Feedback Should..

- Be related to learning goals and success criteria
- Be specific and clear
- Provide suggestions, hints or cues rather than correct answers
- Focus on the task and not on the student
- Engage students cognitively in the task

Feedback

I agree with the pattern that you have identified in the table. How could you prove that the rule you wrote works for all the values in the table?

I see all the combos that have a chocolate chip cookie nicely organized to support the 6 in your fraction. How can you use one of the strategies we discussed to further support the 12 in your fraction?

(Cuellar & Rahming, 2009)

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Feedback

"You have planned your fair test in general terms. Now think about how you would conduct your test in a systematic way so that you can draw conclusions from your test. I suggest you review some of the examples of fair tests we looked at from last year's students to help you think about how you will conduct your measurements and record your data in systematic ways so that you can compare your results."

(Heritage, 2010)

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Summing Up

- Evidence gathering is central to formative assessment
- There is no one way to gather evidence
- There are 5 criteria for the “formativity” of evidence
- Responsive action is dependent on content knowledge, interpretive skills and pedagogical content knowledge

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Questions or Comments?

Please use the chat box to send questions or comments for Dr. Heritage.

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