Assessment in Action: Formative Uses of Assessment

NSTA Professional Development Institute

Wednesday, April 2, 2014

What makes assessment formative?

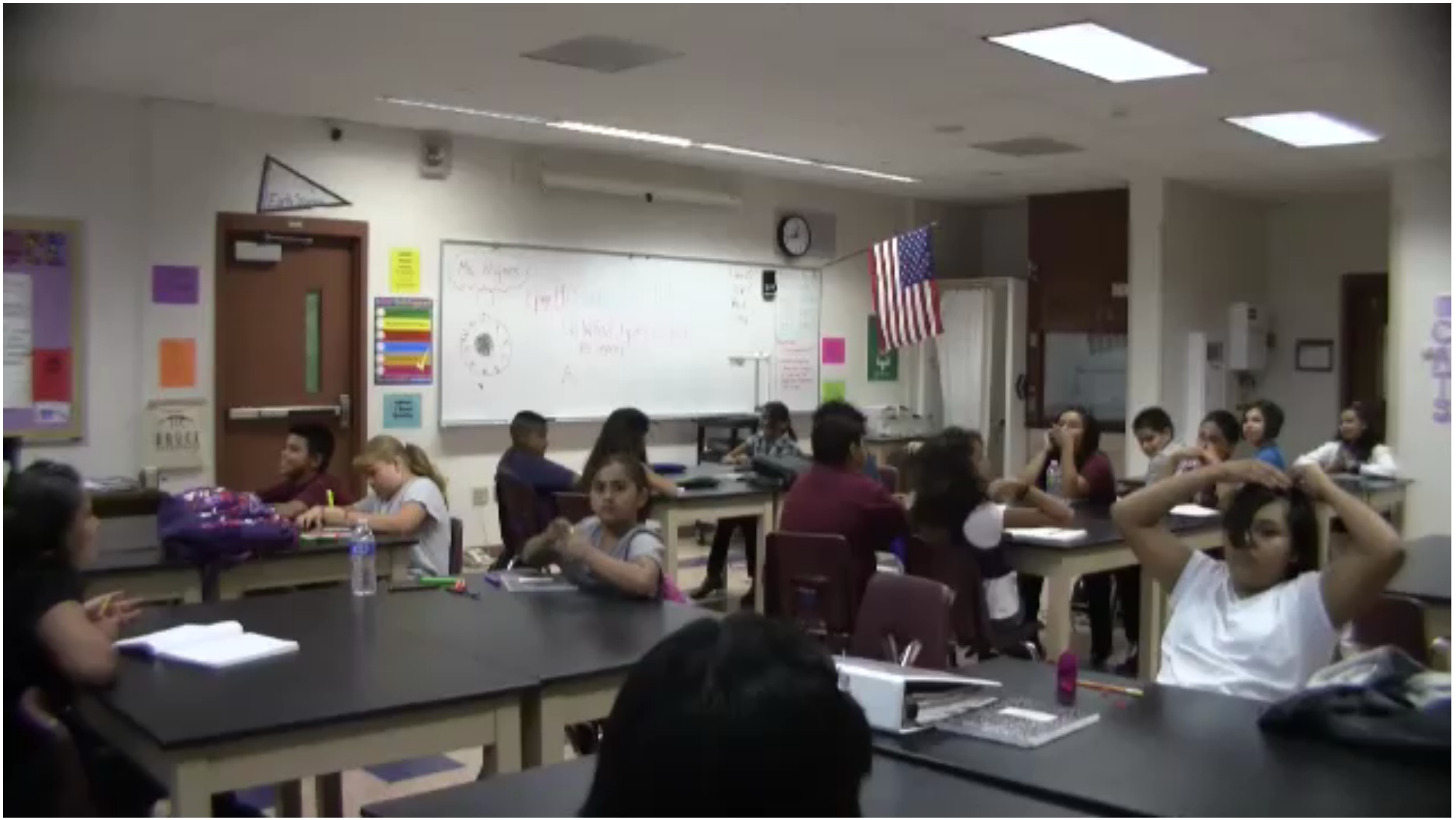
- Elicit understanding of core ideas in the context of practices and cross-cutting concepts to
  - discover and build on students' everyday experiences
  - go beyond just "right" and "wrong" to diagnose how students are thinking and reasoning
  - decide "what's next" for a class, small group, or individual
  - revise ideas over time and develop class consensus about shared understandings

Video Analysis

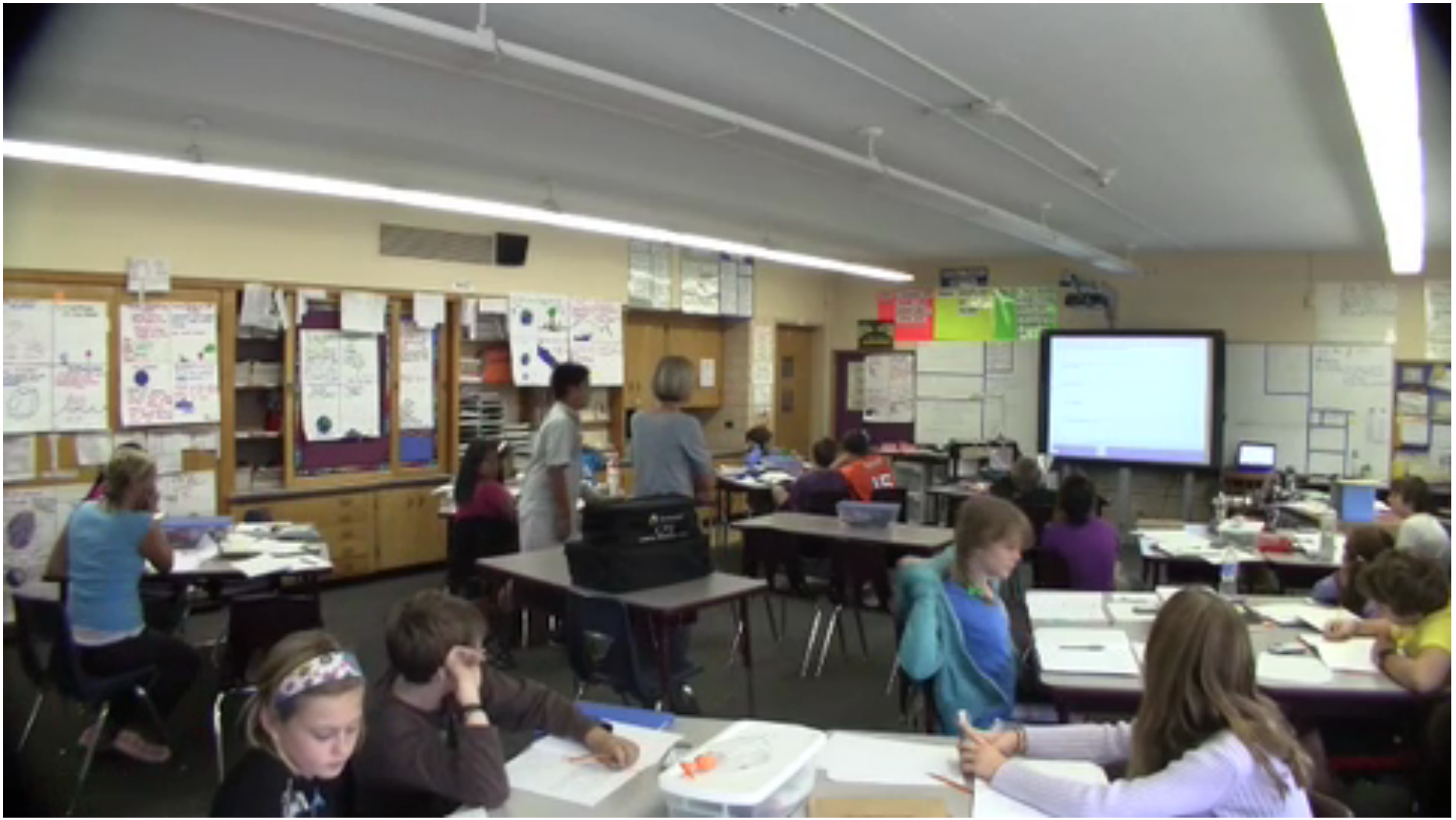
With a partner

- Discuss…
  - What kinds of questions is the teacher asking?
  - How does the teacher respond to student ideas?
  - How do students respond to each others' ideas?

Teacher 1



Teacher 2: Question



Teacher 2: Question

Investigation 1: Different Types of Rocks	Reflect and Revise Question 1.1

Goal Facet

Rocks change over time and new types of rocks form through these changes.

Pose the Question

What does all rock have in common? Be prepared to explain your reasoning and see if you can think of an example of a rock that does not have this characteristic.

a. All rock is hard.

b. All rock is heavy.

c. All rock is jagged.

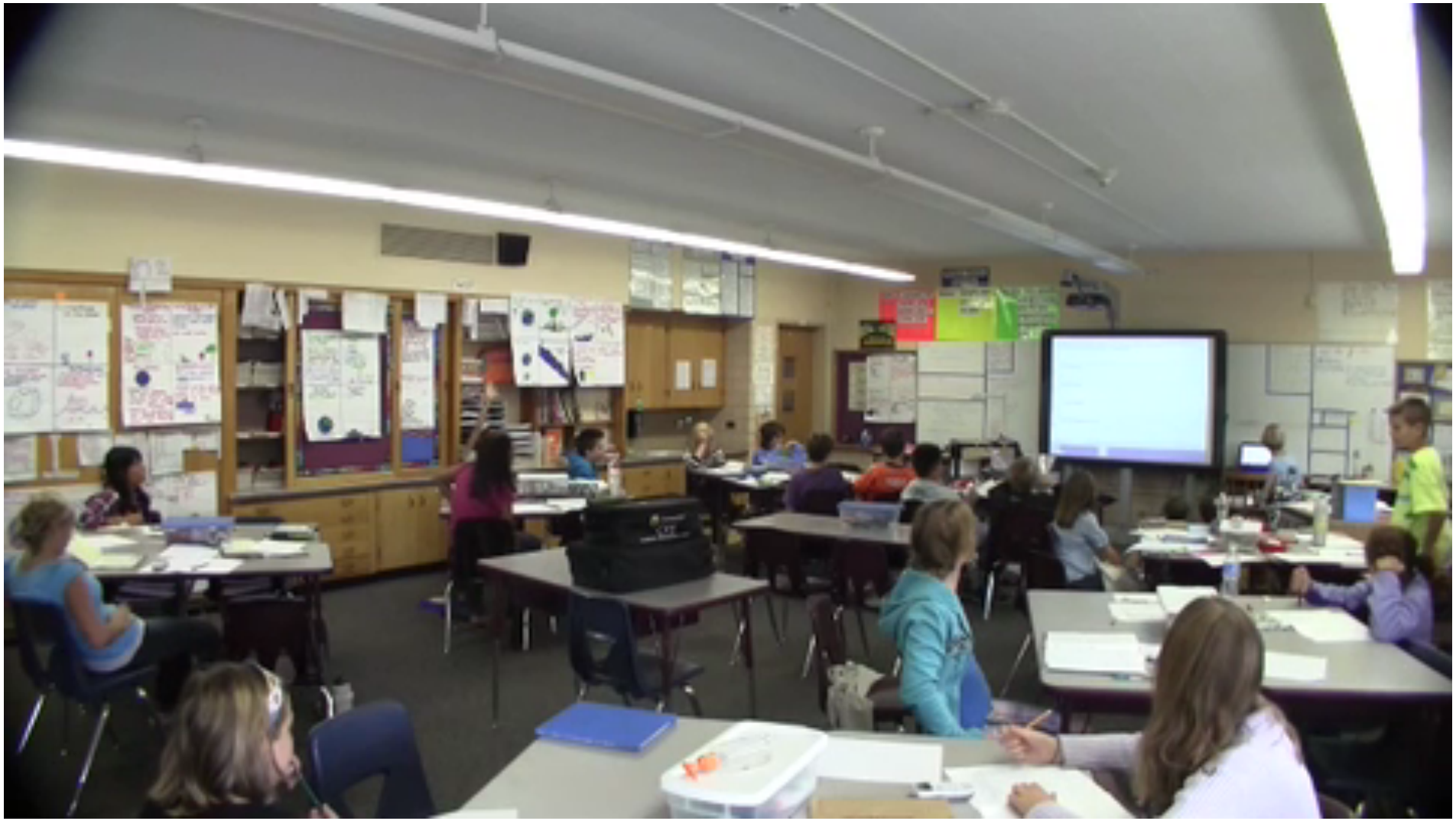
d. <u>All rock is changing over time.</u>

Spark Discussion

Why might someone think a, b, c, or d is a reasonable answer?

Follow-up: Can anyone think of an exception to the idea in a, b, c, or d?

Teacher 2: Discussion



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Beyond Right and Wrong

- Take an interpretive stance toward student thinking
  - Find out why a student thinks what they think.
  - Encourage students to listen to each other and ask questions until they can rephrase another's idea in their own words.
- Look for patterns in student difficulties.
- Build bridges, don't "seek and destroy."

Build a Scientific Culture in the Classroom

- Establish *epistemic* and *social* norms for practice early in the year.
  - Epistemic: Who or what has *authority* in this classroom? How do we support claims?
  - Social: How do we build and contest claims, knowledge, models in this classroom?
- Align norms to specific science practices, grounded in particular core ideas.

Some Potentially Helpful Norms

- Everyone participates
- Support claims with evidence
- Challenge ideas but respect the person
- Revise and rethink often

Some Potentially Helpful Norms

Related to developing a model to describe the cycling of Earth's materials and the flow of energy that drives the process

- Everyone participates
  - Students working in groups, not the teacher, will build a model from observations and simulations.
- Support claims with evidence
  - Evidence should link observations from experiments or simulations to an underlying mechanisms, such as mechanical weathering, mantle convection.
  - Models should account for all the evidence.
- Challenge ideas but respect the person
  - Students present and defend their models to the class.
  - Students evaluate models for what each shows and hides, helps to explain.
- Revise and rethink often
  - Students will revise their models based on feedback and further investigation and re-present them to the class.

Talk Moves

Talk Move	*Example*
Revoicing	"So let me see if I've got your thinking right. You're saying _____?" (with space for student to follow up)
Asking students to restate someone else's reasoning	"Can you repeat what he just said in your own words?"
Asking students to apply their own reasoning to someone else's reasoning	"Do you agree or disagree and why?"
Prompting students for further participation	"Would someone like to add on?"
Asking students to explicate their reasoning	"Why do you think that?" or "What evidence helped you arrive at that answer?" or "Say more about that."
Using wait time	"Take your time. . . . We'll wait."

Example: Revoicing

Student	**When the water is going this way and that, it's not the strongest of currents. I don't think it is strong enough to really take away any of that, a large factor of the sediments.**
Teacher	**So you're saying that it's typically gentle?**
Student	**Yeah.**
Teacher	**Typically gentle so not much erosion going on?**
Student	**Yeah, not that much.**

Making Tasks More In-formative

Discuss with a Partner

- When might this fit within the flow of your existing year? When would it fit within a unit of instruction (e.g., early on in instruction or mid-way through instruction to check in on their learning)?
- To what extent is your task "diagnostic"? What student problematic ideas or misconceptions might your task reveal?
- How can you adjust your task to elicit additional student ideas (e.g., what follow-up prompts could you use)?
- How might you orchestrate a whole-class and/or small group discussion of student responses to the task?