

# Eliciting Evidence through Questioning

Questioning is one of the most powerful tools teachers have at hand to elicit and explore student thinking. A good series of questions can quickly illuminate what and how students are thinking. Effective use of questioning provides ongoing checks that help to uncover student understandings **throughout the learning sequence**. Effective oral questioning aids cognitive growth, helps students make connections to prior knowledge, contributes to a classroom culture that promotes learning and risk-taking, and supports students' ability to internalize next steps in learning.

Questioning to support formative assessment should involve a significant percentage of **higher order thinking** questions. Because they do not have a "right" answer, higher order questions engage students in more cognitively complex thinking. Higher order questions may focus on processing, interpreting, synthesizing, predicting, evaluating, analyzing, or applying information in order to infer, draw conclusions, predict, prove, or justify their thinking. The purpose of questioning is to support students to explore and deepen their understandings.

However, the research on questioning indicates that few teachers use higher order questions regularly in their practice. About 60% of teachers' questions are factual or recall questions and about 20% are related to management of the classroom. Only about 20% of questions require students to engage in higher cognitive processes (Cotton, 1988). Similarly, many teachers do not employ the key support strategies that give questioning techniques their power. Studies of wait time (Tobin & Capie, 1980) indicate that teachers do not use sufficient wait time a) before calling on a student, b) after calling on a student, or c) after the student answers. This is despite the fact that wait time increases participation, enhances the complexity of student responses, and improves equitable participation.

In formative assessment, questions are a key strategy to elicit evidence of student learning during a lesson. Targeted questions help teachers and students better understand their current learning status, and also help identify ways students may move learning forward. Skillful teacher questions may also serve to nudge students along as they consider and process new ideas and concepts, on their way to meeting the learning goals. Below are key strategies to improve questioning in formative assessment:

1. Prior to teaching a lesson, plan a sequence of questions that can prompt student thinking throughout the lesson. These questions might be organizing in the following ways:
  - Draft questions that will elicit thinking at key points in the lesson. Consider questions to ask at the start of the lesson that uncover student foundational

knowledge or help students explore the learning goal. Consider higher-order questions that will support understanding of how students are progressing, which can be asked in the middle of the lesson. Also, identify several synthesis questions that will elicit evidence of student progress as they near the end of the lesson.

- Sequence questions to address appropriate cognitive demands. For example, ask knowledge and comprehension questions about new content prior to questions of analysis and evaluation.
2. Use questions to engage in assessment conversations. The typical questioning pattern in a classroom is, “teacher initiation, student response, teacher feedback,” in which the feedback often takes the form of evaluation rather than helpfully descriptive feedback. This pattern does very little to extend student thinking, nor does it engage other students in the classroom in the question and answer process. In an “assessment conversation” the teacher asks a question, the student responds, and then the teacher uses the student response to further learning and explore student thinking (Ruiz-Primo & Furtak, 2006). In this type of interaction pattern, teachers help students articulate their thinking and encourage students to make meaning from each other’s strategies and reasoning. Teachers can begin with a question, then follow-up to develop an assessment conversation in a variety of ways:
- Point out salient features of the students’ thinking/strategies by asking them or others to explain further (“Can you build on this idea you’ve mentioned?” and “The way you’ve thought about this element is interesting, can we take a closer look at that?”)
  - Build on student thinking to make connections (“How would this connect to what we studied in our last unit on nutrition?”)
  - Challenge students to prove their thinking (“What evidence do you have to prove that?”)
  - Probe students’ ideas and misconceptions (“What would that look like if...?”)
  - Bring other student voices into the conversation (“What do you think about what was just said? Can you build on his response?”)
  - Ask students to restate each other’s ideas (“Can you restate what Tanisha just said?” and then, “Tanisha, does that capture your thinking?”)
  - Engage others to elicit different thinking (“Can you think of a different way to approach that problem?”)

When you ask students questions that provoke students to reflect on, clarify, and explain their thinking about actions, you gain insight into their understanding and reasoning. In doing so, you also model the type of discourse that students will have with one another as they conduct peer feedback and develop other strategies to support their peers during learning.

3. Learn strategies to **use wrong answers to uncover thinking** and move learning forward. We all learn from our mistakes. Learning is enhanced when students are actively exploring emerging understanding. When students learn and experience success from exploring a wrong answer, they will be more likely to respond to future questions, even if they are not sure of the right answer. To create a safe learning culture, students must be encouraged to share emerging ideas, and they must be assured that there is no risk of personal harm (ridicule by peers, poor grades on practice tasks) when taking such risks. Teachers can help this process by a) exploring in advance of the lesson how they will address wrong answers, and b) developing routines and responses that support students to explore misconceptions and emerging knowledge.

- Before the lesson, develop a list of questions to ask during the lesson and, for each, anticipate misconceptions, partial understandings, or emerging knowledge. Spend time to consider how to respond to emerging understanding. Being able to articulate for students where they are in their learning in ways that honors their thinking and progress towards the learning goal encourages students to take risks and show a growth mindset during learning.
- Develop questioning routines to engage students when they have misconceptions. Responses to wrong answers might include requesting specific examples from the student (“Let’s explore how that might work...”), a request for clarification (“I wonder what you mean, exactly, when you say....”), or an opportunity for the student to rethink or rephrase an idea (through, for example, a think/pair/share strategy).

4. Apply the **research on effective questioning**

*Provide students with thinking time twice* – first, after asking a question, and later, after a student has responded to a question. This means developing a norm in the classroom that **pausing is an integral element of the questioning process**. Students (and teachers) need time to reason and consider their answers. Research (Rowe, 1986) shows that teachers provide an average of less than one second for wait time and that teachers give less wait time to perceived low achievers. When teachers increase the amount of wait time between question and answer, and again between answer and response, to two to three seconds, students show significant gains in the length and complexity of their responses (Cotton, 1988). When teachers use sufficient wait time, more students participate in answering, responses are longer and more confident, and students are more sophisticated in the ways that they comment, respond to, and thus build upon, each other's answers.

The lesser known finding from Cotton's research also supports the formative assessment process. In addition to student gains, teacher practice also changes with increased wait time. With increased use of wait time, teachers increase the variety of questions they ask, and increase the cognitive level of questions (Cotton, 1988).

**Employ pre-thinking strategies** (such as think/pair/share or pre-writes) when asking cognitively complex questions. Students benefit from processing information and rehearsing their answers, and gain confidence to join in a whole class discussion after they've had a chance to prepare their response.

5. Develop and post a list of effective question stems appropriate to your context. A starter list might include:

- What evidence can you find to...?
- What have you tried so far?
- What might happen if...?
- What details can you add?
- What might we infer from...?
- In what other ways might we show...?
- What conclusions might be drawn from...?
- Can you predict what might come next?
- What is alike and what is different about your method of solution and hers?
- What have you learned before that might help you solve this problem?

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## References:

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