

Helping Teachers Refine their Questioning Skills to Formatively Assess Student Understanding

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“About 60% of teachers' questions require students to recall facts; about 20% require students to think; and the remaining 20% are procedural.”

- Meredith D. Gall

Source: <http://files.eric.ed.gov/fulltext/ED067650.pdf>

Teacher Issues



- ▶ It is difficult to spontaneously come up with questions that will challenge students to make connections without simply telling them what to do.
- ▶ Classroom minutes are limited and mathematical discussions will use some of them.

Student Issues



- ▶ Students have been trained to believe that teachers only care about the answer to the problem, not how they thought about it.
- ▶ It takes time for students to adjust to explaining themselves and the idea of discussing the problem will seem foreign to them at first.

Questioning Scenarios

- The activity begins with teachers in groups of three taking the roles of teacher, student, or observer.
- The individuals playing the role of teacher and student each receive a slip of paper describing their scenario.
- The individual playing the role of observer waits to record all of the teacher's questions to the student.
- Once the activity begins, the teacher will talk to the student in the context of the scenario they read about on the slips of paper.

What did you get for the area of the circle with a radius of 2 units?

4 pi

Great. Do you have any questions?

No

What did you get for the area of the circle with a radius of 2 units?

4 pi

Great. How did you get your answer?

The radius is 2 so I plugged it into $2\pi r$ and got 4 pi.

STANDARDS FOR MATH PRACTICE

- *MP 1 - Make sense of problems and persevere in solving them.*
- *MP 3 - Construct viable arguments and critique the reasoning of others.*
- *MP 6 - Attend to precision.*

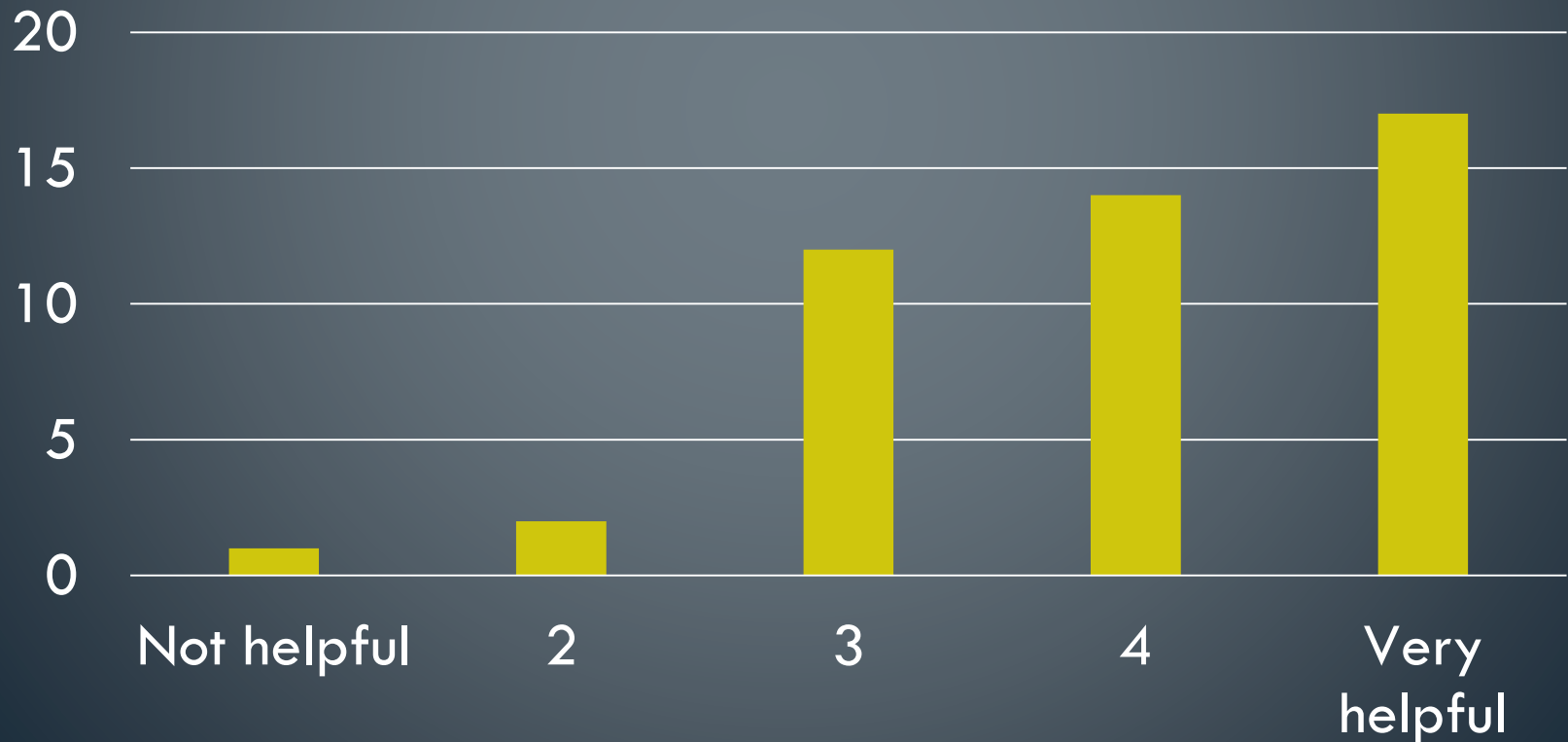
Lessons Learned



- ▶ When introducing *Questioning Scenarios* to a group for the first time, lead with an example.
- ▶ Pick scenario topics that the teachers are certain to feel comfortable with even if it means picking a topic below the grade level they teach.
- ▶ Consider providing a list of questions for teachers to use when they struggle to find one to ask.
- ▶ The best ideas for your own questioning scenarios often come from misunderstandings that you observe or experience.

Teacher Survey

- How helpful was the questioning scenarios activity in terms of developing questions that encourage elaborated responses?



Strategy with Biggest Impact

- “The questioning. I was always happy that the kids gave me the right answer, but I never asked the question ‘why’? That has really changed my way of teaching.”
- “I also got a lot of insight from the questioning work we did....How asking better questions can really help me understand what my students are REALLY thinking when they work out their math problems!”

Feedback from SFUSD

- “The questioning activity you presented got at the core of what many of our teachers struggle with as they try to orchestrate meaningful student discourse.”
- “The teacher response to this activity was overwhelmingly positive. Many of them mentioned this activity as a highlight of the day. Others asked us to bring more of these scenarios to future professional development days.”

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