

Mathematical Questioning

by Chelsie Wolcott

Good questioning techniques are an integral part of any successful mathematical experience. Good questioning makes students think and help them make sense of the mathematics in an activity. Questioning is an important tool in the introduction of a topic, in any mathematical discussion, and in informal assessment.

Good questioning relies on knowledge of content and development. For the process to work well, the teacher must engage in active listening and appropriate responses.

Questioning can effectively **introduce a topic**.

“What do you know about...?”

“What do you want to know about...?”

These two introductory questions can help a teacher pinpoint areas of misunderstanding as well as provide a starting point for instruction. These **open-ended** questions allow all students to participate and explore mathematical ideas.

When using questioning with an individual, small group or whole class it is important not only to use **wait time** before responding, but also to allow all students the time to think through their answers. Questioning should lead to discussion, not end it.

By **not affirming or denying a response**, the teacher allows the students to continue the mathematical sense making. This is often very hard for the teacher to do, since we have been conditioned to immediately give positive feedback. Unfortunately, immediate positive feedback has the undesired result of shutting down any other thought on the topic! (Students will also want an immediate verification; comments such as “but I gave that answer” will have to be answered.)

“Does anyone agree or disagree with this answer?”

“Does anyone have another idea?”

These questions allow all the students to think and explore the question asked.

Good questioning can help a student with **higher level thinking skills**.

“What if...?”

“How many ways...?”

“Can you find another way...?”

“Why isn’t...?”

“When would we use...?”

These questions help students explore different possibilities and methods in mathematics.

Good questioning helps teacher assess what has been understood and where misunderstanding are.

“Why is...?”

“Why can’t we...?”

“How do you know...?”

“What’s wrong with...?”

“What if I...?”

Students must communicate their thoughts and reasoning, often clarifying and making sense of the mathematics while doing so. The teacher’s role is to help the student make the mathematical connections, to help them see, and to make sense of the concept. Questioning techniques help do this.

For additional information about mathematical questioning see: Developing Mathematical Thinking with Effective Questions

<http://www.wisconsinrticenter.org/assets/files/Universal%20Math/Day%202/DevelopingMathematicalThinkingWithEffectiveQuestions.pdf>