The practice of questioning is important in all content areas. In mathematics, questioning by teachers helps inform and shape the direction and content of student dialogue, which in turn helps teachers observe student thinking. Effective questioning requires not only a deep understanding of the mathematical concepts of the lesson, but also of the many different ways that students may try to make sense of mathematics.

Effective questioning places a high value on student contributions to discourse. To move away from a limited model of question-response-evaluation, you, the teacher, must assume the role of facilitator, gently guiding students to develop their own mathematical insights in lieu of simply giving them the right answers. In this role, you need to:

- Consider the implications of the question on the students by asking yourself: What purpose does the question serve? What is the intended effect on the learner? How does it contribute to or detract from the momentum of the lesson?
- Develop a repertoire of question types to use in specific situations.
- Realize that the choice of the question type is highly dependent on teacher knowledge of the student, the student’s learning style, the context of the lesson, the classroom environment, and the teacher’s teaching style.
- Recognize your own individual teaching strengths and weaknesses and learn new strategies to incorporate into your own style.

**About the Questioning Framework**

In the following pages, you will see a simple two-dimensional questioning framework, defined by question purpose and form. This framework is designed to help you plan questions that specifically support, shape, and extend mathematical dialogue in the classroom. This framework can be applied across curricula, content, and grade levels. Many of the ideas presented can also be applied across disciplines.
While the purpose of this taxonomy is to maintain momentum of a mathematical dialogue, other ways to categorize and analyze questioning strategies have been developed and used effectively. (We encourage you to explore some of these other taxonomies to get a feel for how they are similar and different. To do so, see Additional Resources in Teachscape’s left navigation bar.) However, shades of gray exist in any taxonomy. In some cases, for example, a single question can be associated with two or more different categories. At a certain point, the awareness and use of new and varied questioning strategies becomes more important than the initial exercise of categorization.

By considering the question purposes and forms presented in these sections, you will be better prepared to pose questions that motivate children to think both independently and collaboratively in the mathematics classroom.

- The section, “Question Purposes,” defines three main purposes of questioning
- The section, “Question Forms,” explains how questions are phrased or framed, leading to different types of learning outcomes

All questions can be categorized by their combined purpose and form.

**Note:** This framework does not specifically address the assessment of student understanding through questions. Rather, it helps teachers craft questions and lines of questioning that enable students to reach understanding, consider many approaches to a problem, reach informed conclusions, and evaluate possible solutions on their own. To learn more about the assessment of student understanding to inform instruction, we recommend Teachscape’s companion course, *Effective Formative Assessment.*

**Question Purposes**

The *purpose* of a question refers to the kind of thinking required for a student to attempt to answer the question. This framework suggests three purposes, which correspond loosely to the beginning, middle, and end of the problem-solving process. Examples of each will be provided in the Questioning Examples matrix.
1. A **clarifying** question requests information from the students to help them uncover the meaning of the question so they can get started. A classic example of a clarifying question is, “What is the question asking us?” Clarifying questions also help teachers learn more about what students mean when an explanation is unclear.

2. A **generative** question invites students to explore new ideas and to consider the question from different perspectives. Generative questions help students make connections to personal experiences or previously studied topics so that students can elaborate on existing lines of thinking.

3. A **confirmative** approach helps students articulate clearly what has already been learned or stated. Dialogue in any discipline needs an attempt at closure—grounding the conversation through refinement of ideas. Confirmative questions invite students to clearly state results, opinions, and discoveries before the class arrives at a final summary together.

In practice, a teacher mixes questions that are clarifying, generative, and confirmative in a cycle of interaction with individuals, small groups, and large groups. When the teacher is satisfied with the level of understanding reached by the students on a particular point, the cycle repeats, this time focusing on new, higher level milestones.

**Question Forms**

The *form* of a question describes how the question is phrased or framed— independent of the purpose. That is, it describes the shape the question takes to drive the purpose. Examples of each are provided in the Questioning Examples matrix.

This framework presents four forms of questioning. In some cases, the statements surrounding the actual question help identify the form of the question.

1. **Directed:** requires a specific, one-word or single-sentence response. The teacher and student both expect that the response will be immediately evaluated, and that it may elicit further questions or guidance.
2. The following are two varieties of the same form. They differ only in the way the teacher acknowledges the student’s thinking. Highlighting: spotlights a student’s contributions and uses these ideas to move a discussion along by holding them up for deeper consideration. Echoing: also spotlights a student’s contributions, this time paraphrasing a statement, clarifying it if necessary, to allow the class to consider its meaning and further implications.

3. Cueing: often used in one-on-one situations to help students articulate their mathematical reasoning. While cueing, a teacher may repeat a student’s phrasing before inviting the student to expand on his or her thought process that led to the statement.

4. Conceptual facilitation: can help students explore the tension between prior beliefs and new ideas. It is more directed than other strategies, and it can be used if a student voices alternative views that may block acceptance of new ideas or conceptual frames. If a student is not making connections, the teacher may elect to explore tensions between a student’s response and other opinions in the class, prompting the group and the student to consider alternative responses.

These forms can reveal subtle differences in the instructional approach and tone, such as:

- What is the rationale behind the teacher’s approach?
- How important is it for students to understand the concept at hand rather than moving on?
- How much time does the class have to explore the answer?
- How does the type of question make the student feel?
- What is the intended response?
- Does the intended response provide insight into how the student thought about and solved the problem?
- Does the intended response demonstrate that the student understood the problem?
- Does the answer lead to other questions?