

# QUESTIONING STRATEGIES

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## A good question is worth a thousand thoughts

*"Good questioning requires skill and planning."*

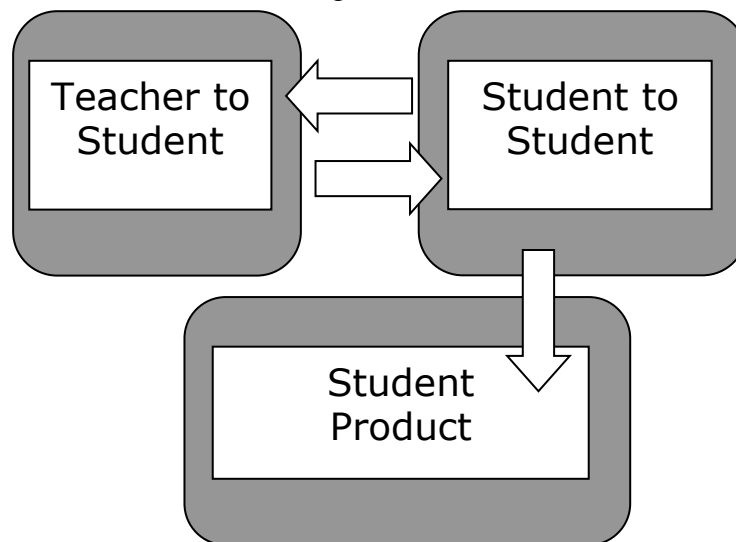
(EdThoughts, Aimee Kruger and John Sutton, 2001)

Quality teaching and learning includes the art and skill of questioning. "Huh?" you say, "Haven't we been here before? This is just old stuff."

Au contraire! Questions are the basic blocks of good teaching and learning. Without them, nothing would be explored and we'd all be in the dark; with them, the world – and our classrooms -- are a more impressive and dynamic place.

We as teachers must recognize that when we improve the quality of our questions to students, we are not only prompting deeper thought, but we are encouraging student discourse.

Of course, both goals hold students accountable with products (e.g., notebook, whiteboards) that can clearly demonstrate their understanding.



In this article we examine the role of questioning between the teacher and the student. Teachers use a variety of questions within their day-to-day classroom activities including low-level yes/no questions, simple recall questions, rhetorical questions and leading questions (you know...when querying students for a word and giving the hint "starts with"...). These types of questions make minimal demands on student thinking.

Our goal is to decrease these interchanges and “get better” at asking and probing for student understanding. We have found that probing deeper for student understanding is a challenge for both novice and experienced teachers.

How does the teacher really know, based on a student response, when conceptual understanding is evident? When do student responses seem to show understanding but probing reveals misconceptions? Where and when does the teacher make a decision to ask follow-on probing questions? What type of question will be the most effective for the purpose?

Our classrooms need to be places where teacher questioning is purposeful and meaningful; this requires a shift in thinking as noted below in Fig. 1

**Fig. 1 Quality Teacher Questions**

<b>Less Of</b>	<b>More Of</b>
Rapid fire teacher questions	Thoughtful questions that are linked to push student thinking
Questions directed to the whole class, with few students responding.	Questions directed to student partners or small groups.
Questions that ask students to state small pieces of knowledge unrelated to the larger context.	Questions that require connections between and among concepts
Questions that ask what students know	Questions that ask how students know.
Questions with quick answers.	Questions with wait time for student thinking
Questions limited to current understanding	Questions that extend understanding to a new context
Plan activities in a lesson	Plan questions in the activities based on expected and unexpected student responses.

### **Moving Toward “More”**

Google “questions” and you will find a plethora of articles that are overwhelming and daunting. Yet, there is a theme running through many of the articles: changes in teacher questioning practice are rare. For example, Walsh and Stattes (2005) indicate that research conducted for

more than 100 years about teachers' use of questioning strategies show that very little has changed in classroom practice.

Yet, we know that questions promote student learning and that teachers should plan their questions before asking them to ensure that questions match the teacher's learning goals. These questions should require students to engaging in higher-level thinking. A few carefully prepared or selected questions are preferable to large number of questions. (Walsh & Stattes, 2005 p. 12).

Here are two strategies that we have found effective in increasing the quality of teacher questions and student understanding. The first addresses the level of question the teacher asks. The second has to do with the follow-on question to understand student thinking.

## Question levels

Level of questions refers to the type of "brain engagement" the student does. An *input* question asking a simple fact (e.g., how many bones are there in the human body?) requires little engagement. The student either knows or does not know the answer.

A *process* question that asks student to compare and contrast (e.g., compare the pelvic structure of a bipedal and quadrupedal animal) engages the student's brain in seeking patterns between and among their facts/concepts.

An *output* question that asks students to apply their understanding in a new situation -- or to synthesize and evaluate their knowledge -- stretches their conceptual framework.

The key for teachers moving between and among input, process and output questions is linked to the questions' purpose in guiding student thinking. Input questions that focus students on attention to detail in an observation can provide the basis for linking a small fact to a larger concept.

Using all three levels of questions – input, process and output - support findings from *How People Learn* (Bransford et al., 1999) that describe an "expert" as one who:

- (a) has a deep foundation of factual knowledge,
- (b) understands facts and ideas in the context of a conceptual framework, and
- (c) organizes knowledge in ways that facilitate retrieval and application.

Teachers should help students become familiar with the different levels of thinking and help them be aware of the kind of thinking required by the question (Walsh & Stattes, 2005 p. 13).

One way to accomplish this is to be overt about your questioning levels. Figure 2 lists verbs for questions that help categorize the level of question being asked. *Many K-12 Alliance teachers have enlarged this chart and posted in their room* as a reminder for them and their students of the level of thinking being asked for and used in the discussion.

**Fig. 2 Levels of Questions**

**INPUT**

complete	list	observe	identify
count	locate	recite	
define	match	select	
describe	name	tell	

**PROCESS**

analyze	arrange	report	arrange
explain	separate	classify	group
sequence	combine	infer	show
compare	invent	cause/effect	contrast
analogy	relationship	construct	organize
summarize	distinguish	plan	synthesize
estimate	produce	use	write

**OUTPUT**

evaluate	imagine	build	model
expand	judge	choose	speculate
extrapolate	predict	create	forecast
project	decide	generalize	recommend
discuss	hypothesize	apply	principle

**Follow on questions**

While you might think that asking a good question is the ticket to push student thinking, we know that student answers often reveal only partial understanding. Frequently the student reveals partial understanding and only shows the misconception on probing (see Fig.1) of a concept. Students often give responses that indicate an appearance of understanding, but on our reflection leaves us wondering, “How exactly are they thinking about the topic?”

The bottom line is that in order to understand student thinking, you have to ask more quality questions that continue with the student’s line of reasoning, pushing and probing for underlying assumptions, alternate conceptions and partial understanding. We call these types of questions “follow on” because they follow the student’s lead.

Follow on questions probe for student thinking. Probing can be used to help students:

- Clarify: to make something clearer by explaining it in greater detail; paraphrase, make more accurate

- Redirect: to focus attention on another aspect of the phenomena
- Summarize: to state the main ideas; synthesize to a bigger idea
- Extend: to apply to a new situation
- Reflect: to think about; active persistent and careful consideration

The teacher selects the question based on what needs to be “uncovered” in the students’ thinking. For example, if the teacher is unclear about what a student is saying, clarification might be the best type of question to use; if the teacher wants to know how a student is in putting several ideas together, then summarizing might be the best type of question.

The following transcript shows the power of using follow-on questions to help students articulate their thinking and make powerful connection.

### **Dialogue With Quality Questioning**

In a fourth grade classroom, students had been exploring with batteries, bulbs and wires and discussing how and why a complete circuit works. The teacher posed the question “Why did the light bulb light?” to pairs of students as he observed them working. The teacher wanted to see if the students had a conceptual understanding of what a complete circuit includes and how it enables a light bulb to light.

Teacher (T): *Why did the light bulb light?*

Student 1 (S1): *Because it is a complete circuit.*

T: (clarify) *Explain what you mean by complete circuit.*

S1: *It is when electricity goes in a circle.*

T: (reflect) *Does it have to be a circle? Could it be another shape?*

S2: *Yes, it is always a circle.*

T: (clarify) *Are their parts in your circle? What are the parts?* S1: *A battery, a wire and a bulb.*

T: (redirect) *What would happen if we placed the parts in a square? Would it be possible for the bulb to light?*

S2: *Student hesitates...then says...yes, the bulb could light in a square.*

T: (clarify) *How do the parts help make the light bulb light?* S1: *One wire needs- to touch the metal part on the bottom of the light bulb and one end of the battery, and one wire needs to touch the metal on the side of the light bulb and the other side of the battery*

T: (summarize) *How would you add this information to your idea of a complete circuit?*

S1: *So parts need to be connected in a complete circuit.*

T (probe) *Can you think of another shape for the complete circle in addition to a circle or a square?*

S1: *A triangle could also be the shape for the circuit.*

T: (extend) *What if you had two light bulbs? What would you need to do now to light both of them?*

S2: *We might need more batteries.*

S1: *Or more wires.*

T: (reflect) *Think about how you could test your idea.*

S2: *I think we should try to hook up both bulbs to two batteries. (students try and find they don't*

have enough wires)

T: (redirect) *How might you do this with one battery? How many wires would you need?*

S1: *I see how we can connect the two bulbs with one wire and then each bulb to an end of the battery. We need three wires.*

T1: (Summarize) *How is this circuit like the first one you made?*

S2: *They both made the light bulbs light.*

S1: *The circuits were complete because the electricity went in a path when connecting the bulbs, wires and batteries the right way.*

Like levels of questions, follow-on questions should be planned in advance of teaching based on student expected responses. Figure 3 is useful in pre-thinking questions. Place the first question in the center of the “wheel” and then list possible expected student responses in the first circle. Decide what probes would be necessary in order to help students clarify, reflect, summarize, or extend their thinking. Write these questions, including ones that help redirect students, in the outer circle. Then when teaching, keep the wheel handy for planned questions based on student responses.

Using these two strategies—levels of questions and follow on questions, teachers can illuminate student thinking and instill habits of mind that build the foundation for a lifetime of learning.

**Fig. 3 Follow On Planning Wheel**

