

Questioning Techniques

Introduction

Good questioning skills are an important part of good teaching. The type of questions that teachers ask is one of the major determinants of the nature of the classroom. When teachers stick with direct recall questions such as *what* or *when*, the classroom environment tends to be more teacher-directed where a single correct answer is valued.

Questions allow us to make sense of the world. They are the most powerful tools we have for making decisions and solving problems, for inventing, changing and improving our lives as well as the lives of others. Questioning is central to learning and growing (McKenzie, 1999).

Asking probing questions is much more difficult. Developing questions that probe, engage and enable students to think deeply is a skill that needs to be developed. We know that probing questions promote student inquiry and increase student engagement and achievement; so as teachers we must hone this skill.

Garbage in, garbage out, is a popular truth, often said in relation to computer systems: If you put the wrong information in, you'll get the wrong information out. The same principle applies to communications in general: If you ask the wrong questions, you'll probably get the wrong answer, or at least not quite what you're hoping for.

Types of Questions

There are many different types of questions, each of which is designed to elicit a different response. Teachers wishing well-thought-out responses need to ask specific types of questions. Different types of questions accomplish different tasks and help us to build up our answers in different ways. If teachers ask tantalizing and divergent questions in their classrooms, students are likely to begin asking more interesting or thought-provoking questions. Many types of questions are described below with sample questions teachers might ask elementary school children.

Open questions are good for:

Developing an open discussion	What do you already know about the planets?
Finding out more detail	What else do you need to learn before you're comfortable creating your science fair project?
Digging deeper into a topic	How did you discover this unique idea about Saturn?"

Promoting high-level thinking	Why do you suppose Saturn has multicolored rings?
Seeking a thoughtful explanation	What can you conclude from the evidence?
Developing observation skills	What do you notice here? Tell me about this What do you see?
Concept development	What shapes did you use in your block building? What shapes did the other students use? What does this tell us about block building?

Closed questions are good for:

Testing one's understanding	Name the eight planets.
Obtaining finite information	Has your parent signed the photo release form?"
Setting a frame	Do you know where to place your homework each morning?

Probing questions are good for:

Gaining clarification	How did you learn that you could mix blue paint with yellow paint to get green paint?
Understanding relationships	Why can't a newborn puppy be separated from its mother?
Drawing information out of students who unsure of the topic	You told me that mixing yellow and blue paint made green paint. Use that same thinking to tell me what two colors you mix to make orange.
Drawing Inferences	If we mix all our different paint colors together, what color might we get? Why do you think that?
Digging deeper	You told me you think Pluto should still be characterized as a planet. What are your reasons for your thinking?
Justifying a response	Please explain why you chose to add the water to the dye rather than the dye to the water.
Thinking reflectively	What did we just learn from that experiment, experience, problem, or discussion?
Elaborate on an idea	Let's take that idea to the next level. We have been working to conserve water in our classroom. What if Ms. Smith's classroom did the same thing? What if all the classrooms in our school did the same thing? How would that effect how much water our town used?

Divergent Questions are one of the central elements of inquiry learning. They not only engage students in classroom discussions, they allow them to think independently, creatively, and often critically. Divergent questions allow students to take ownership of their own learning while also feeling a shared responsibility for the learning of the entire class. They allow a number of students to respond to the same question, thereby encouraging student participation. Divergent questions (designed to elicit many different answers) often begin with:

- Imagine...
- Suppose...
- Predict...
- If..., then...
- How might...
- Can you create...
- What are some of the possible consequences...
- What if...

Elaborating Questions extend and stretch our thinking. They take what we know or have learned in our classrooms and extend them to other classrooms or environments. They also help us make inferences about our learning. Elaborating questions often begin with:

- What does this mean?
- What might it mean if certain conditions were different?
- How could I take this farther? What is the logical next step? What is missing? What needs to be filled in?
- What are the implied or suggested meanings?

Levels of Questioning: Part 1

Mr. Coley, fifth grade teacher (Tovashal Elementary School, Murrieta Valley Unified School District, CA) wished to help his students ask better questions. The questioning worksheet (based on Bloom's Taxonomy) he developed for them is summarized below:

Level 1: Knowledge – Exhibits memory of previously learned materials by recalling facts, terms, basic concepts, and answers.

Key Words		Sample Questions
who	label	What is...?
what	show	Who was...?
why	spell	How is...?
when where	list	Where is...?
which	match	How did _____ happen?
omit	name	When did _____ happen?
choose	relate	Why did...?
find	tell	When did...?
how	recall	How would you show...?
define	select	Who were the main...?
		Which one...?
		How would you describe...?
		Can you recall...?
		Can you select...?
		Can you list the three...?

Level 2: Comprehension – Demonstrates understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas.

Key Words		Sample Questions
compare	extend	What is the main idea of...?
contrast	illustrate	What facts or ideas show...?
demonstrate	infer	Can you explain what is happening...?
interpret	outline	What does _____ mean?
explain	relate	How would you classify the type of...?
rephrase	classify	How would you compare...?
translate		How would you contrast...?
summarize		Put in your own words...
show		How would you rephrase the meaning of...?
		What statements support...?
		What can you say about...?
		Which is the best answer?
		How would you summarize...?

Level 3: Application – Solve problems to new situations by applying acquired knowledge, facts, techniques, and rules in a different way.

Key Words		Sample Questions
apply build choose construct develop interview make use of organize	plan select solve utilize model identify experiment	How would you use...? What examples can you find to...? What would happen if...? What parts would you choose to change...? How would you solve _____ using what you've learned? How would you organize _____ to show...? How would you show your understanding of...? What approach would you use to...? How would you apply what you learned to...? What other way would you plan to...? What facts would you select to show...? What questions would you ask in an interview with...?

Level 4: Analysis – Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations.

Key Words		Sample Questions
<i>Verbs</i> analyze categorize classify compare contrast discover dissect divide examine inspect simplify survey take part in test for distinguish list	<i>Nouns</i> distinction theme relationship/s function motive inference assumption conclusion	Why do you think...? What are the parts or features of...? How is _____ related to...? What motive is there...? Can you list the parts...? What inference can you make...? What conclusions can you draw...? How would you classify...? How would you categorize...? What evidence can you find...? What is the relationship between...? Can you make a distinction between...? What is the function of...? What ideas justify...?

Level 5: Synthesis – Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.

Key Words		Sample Questions
build	suppose	What change would you make to solve...?
choose	discuss	How would you improve...?
combine	modify	What would happen if...?
compile	change	Can you elaborate on the reason...?
compose	original	Can you propose an alternative...?
construct	improve	Can you invent...?
create	adapt	How would you adapt _____ to create a different...?
design	minimize	How would you change or modify the plot...?
develop	maximize	What could be done to minimize or maximize...?
estimate	delete	What way would you design...?
formulate	theorize	What could be combined to improve...?
imagine	elaborate	Suppose you could _____. What would you do...?
invent	test	How would you test...?
make up	happen	Can you formulate a theory for...?
originate	change	Can you think of an original way for the...?
plan	propose solve	Can you predict the outcome if...?
predict	solution	

Level 6: Evaluation – Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria.

Key Words		Sample Questions
award	prioritize	Do you agree with the actions...? Why or why not?
choose	opinion	What is your opinion of...?
conclude	interpret	Who would you prove or disprove...?
criticize	explain	What is the value of...?
decide	support	Would it be better if...?
defend	importance	Why did the character choose...?
determine	criteria	What would you recommend...?
dispute	prove	How would you rate...?
evaluate	disprove	What would you cite to defend the actions...?
judge	assess	How would you evaluate...?
justify	influence	What choice would you have made...?
measure	perceive	What would you select...?
compare	value	How would you prioritize...?
mark	deduct	What judgment would you make about...?
recommend	select	How would you justify...?
rule on	agree	Why is it better...?
rate	appraise	

Levels of Questioning: Part 2

San Diego Unified School District simplifies the six levels into three levels: the answer is on the page, the answer is between the lines, and the answer is in your head. This scheme is summarized below:

Level 1 - “The answer is on the page” facts or details These questions can be answered with yes, no, or specific information found in the text. A person can point to the information, read it, or physically see it.			
Count	Define	Describe	Complete
Identify	List	Match	Name
Observe	Recite	Scan	Select
Level 2 – “The answer is between the lines” Implied or Inferred These questions require a person to expand on what they already know by using facts, details, or clues.			
Analyze	Compare	Contrast	Classify
Distinguish	Explain (Why)	Infer	Make Analogies
Observe	Recite	Scan	Select
Level 3 – “The answer is in your head” Connections or Opinions These questions require a person to reflect on their thinking and be able to respond with a personal opinion that is supported by facts. The person makes a value judgment or wonders about something.			
Apply a...	Evaluate	Forecast	Generalize
Hypothesize	If...Then	Imagine	Idealize
Judge	Predict	Principle	Speculate

Questions for Inquiry-Based Learning from You For Youth

You for Youth < <https://www.y4y.ed.gov/>> focuses on inquiry-based learning. They provide some guidelines on developing questions to strengthen your students’ inquiry skills. They are summarized below:

<i>Checklist</i>	<i>Yes</i>	<i>No</i>
Is the question something students really care about?		
Does the question require more than just looking up a simple fact?		
Is the answer something students already know?		
Is there more than one possible 'right' answer?		

Do these questions make the cut?

- Where is Chicago?
- How do they get the toothpaste in the tube?
- How much does a car cost in Japan?
- Why did Dr. Seuss write The Cat in the Hat?
- What is text messaging?
- Is R&B more popular than rap?
- How many people live in New York City?
- Why does the grass turn brown in the summer?
- Is the price of gas the same in Montana as it is in New Jersey?

The Four Steps to the Inquiry Process:

- (1) Ask Question: Probe students to get to the “real” question they want to ask.
- (2) Get Resources: Help students find resources to answer their question. Encourage students to question whether the information is valid or good information.
- (3) Apply Information: Help students decide if the information is useful or answers their question.
- (4) Report Findings: Encourage students to create their own way to show what they learned.

Questions Aligned with the Scientific Process

Another way of developing questions is aligning them with the steps in the Scientific Process. The chart below outlines and explains the steps in the left column, and it provides sample questions in the right column. Use any of these questions in your STEAM classroom instruction or lesson plans.

Scientific Processes	Guiding Questions
<p>Questioning, hypothesizing Forming questions Coming up with possible explanations or answers (hypotheses)</p>	<ul style="list-style-type: none"> • Why is that? • How does it work? How does it happen? • What might happen if...? • What might you see?
<p>Observation Using the senses to gather information</p>	<ul style="list-style-type: none"> • What do you see? Hear? Smell? How does it feel? • What is going on? How do you know? • Does this seem like anything else you know about?
<p>Classification Ordering and grouping observations</p>	<ul style="list-style-type: none"> • Which are the same? Similar? • Different? • How are they similar or different?
<p>Recording and communicating Explaining and presenting to others</p>	<p>How do you describe this? What did you do? How did that happen? What were you looking for?</p>
<p>Use data (e.g., numbers and measurement) to represent and explain</p>	<ul style="list-style-type: none"> • How many? • How often? How much? • How long did it take? When? • How big? What shapes? • How many different...?
<p>Form conclusions, question further, predict, and revise hypotheses</p>	<ul style="list-style-type: none"> • What did you find out? • What do you wonder about? What else do you want to know? • Is there another explanation? • What do you think will happen if... • What might change findings?