

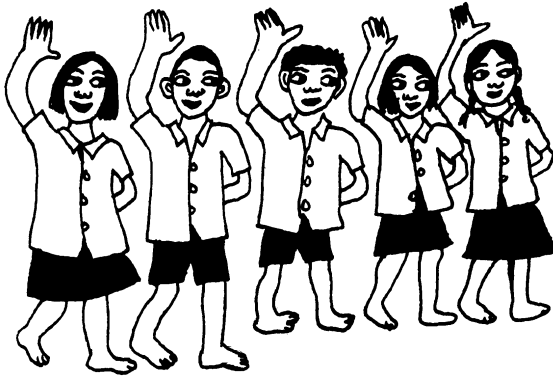
# How to Ask Good Questions

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Asking questions is fundamental to science. Asking questions is also fundamental to teaching and learning. In teaching, it is more important to ask questions and to encourage students to ask questions than it is to give answers. Students can be encouraged to find answers by observing, analysing, discussing, logically reasoning, searching in books or on the internet, doing research, doing experiments, and exploring in other ways - rather than just listening to their teachers, reading their textbooks, and trying to remember what they heard and read.

## **Instead of making a statement, Ask a question.**

Before making a statement to the class, ask yourself whether you can instead ask a question. Maybe some student in the class already knows what you are about to state. Maybe students have various answers and questions already in their minds. Rather than listening to the teacher lecture, the students will learn more if they discuss their conceptions and misconceptions, observe, test, analyse, critically assess, and think deeply about the matter - in other words, if they take active parts in the learning process. For example, rather than stating the definition of what you think is a new word like "vibration", ask the students, "Feel the surface of this tabla when I am striking it. What are you feeling?" or "What is vibration?"

When students ask questions, often the best answer a teacher can give is another question that might get the student to think of the answer themselves. Or a questions that might lead the students to do something to find the answer. Even a simple question like "How do you spell it?" can be answered by asking "How do you think it is spelled?" Often the students will give the correct answer themselves, even though they are not confident that it is correct. When the teacher then says, "Yes, you already knew it!", this will boost the confidence of the student, and also teach them the importance of guessing and reasoning in order to answer questions.

## **Asking questions for Assessment**

Knowing how to ask good questions is also important for assessment, or evaluation. Assessment is formally done through tests and examinations, but can also be a continuous, informal process. Assessment helps teachers figure out the best ways to teach. Assessment lets teachers and parents know how effective their teaching is – it can guide the choice of methods as well as content.

Assessment can also be used to help students, teachers, and parents find out what and how much a student has learned and understood, which areas they need to concentrate on, what skills they need to improve, and what misunderstandings they have. Assessment should be encouraging, not discouraging.

Learning does not mean remembering. There is much more to learning: reasoning, analysing, comparing, calculating, classifying, organising, evaluating, understanding, communicating, working together, learning skills, predicting - and also learning to ask questions and becoming curious and motivated. Since learning involves all these things, assessment requires the assessment of all these things.

In trying to think of questions for assessment, it may be helpful to use Bloom's Taxonomy in which learning objectives are classified into different levels. The usefulness lies in simply asking yourself whether a particular question you are framing goes beyond the level of "knowledge" or remembering. Try to frame questions that require students to think at the higher levels of comprehension, application, analysis, synthesis, and evaluation. A question that requires a student to evaluate will also require the student to analyse, remember, and apply in order to evaluate (separate questions at the lower levels need not be asked).

The questions that you ask will depend on the students' prior knowledge and experience, and the teaching methods that you use in class. Students as well as teachers need to learn to ask relevant, important questions.

### **Ask questions that go beyond memory**

For example, consider the question:

Does the Ganga flow from Allahabad to Patna, or from Patna to Allahabad?

You could just tell students the answer to this question and ask them to remember it. Or you could let them learn through activities. Ask them to make model mountains, rivers, and seas with sand and water, to understand how water flows from mountains towards the sea. Then look on a map to find the mountains that the Ganga flows from, the sea that it flows to, the positions of Allahabad and Patna (the elevations of each city - for higher classes), and figure out the answer.

The second approach will require a lot more time and energy. But it is likely to: (1) enthuse the students about geography; (2) lead them to understand a useful principle (that rivers flow from higher mountains towards lower seas) that will help them solve many questions; (3) lead them to ask additional questions and find their own answers; (4) lead them to reason and think more deeply; (5) lead them to remember the answer.

### **Understand rather than just remember**

If you ask a question that the students already answered before or have already been told the answer to, you are only asking them to remember something. Try instead to ask completely new questions that the students may not have thought about.

The same question could be either a memory question or a question requiring higher levels of thinking, depending on what the students have already been told. For example, suppose you ask the question, "Why do you think some people, even today, do not farm and get all their food by gathering and hunting?" This would just require memory if you had previously told the class that some people do not need to farm because they have plenty of food available in the forests they live in. But if the class had previously just discussed how hunter/gatherers live, and how farmers live, without discussing why, then the students will have to remember and analyse what they remember to think of reasons.

### **Compare**

- (1) Compare physical and political aspects of different parts of the world.
- (2) Compare different periods and places throughout history.
- (3) Compare different political systems.

- (4) Compare rocks to find both similarities and differences.
- (5) Compare the right and left side of your body.
- (6) Compare different people's points of view.

### **Classify or Sort**

- (1) Use the maps in your atlas to find out which countries are mostly desert (or mostly mountainous, or primarily agricultural, etc.)
- (2) Use keys to classify and identify trees in your neighbourhood.
- (3) Sort these nuts and bolts into different sets.
- (3) Use the maps in your atlas to find out in which states cotton and soybeans are grown.
- (4) Use the maps in your book to find out which present day states were once a part of the Gupta Empire.
- (4) Classify birds according to whether they can walk, run, or hop.

### **Analyse**

Use certain skills in an application to a new problem. For example:

- (1) Measure these objects in as many ways as you can (giving each student 1 to 5 objects);
- (2) Find the latitude and longitude of this city using this map;
- (3) Find the area of a particular state using a map and graph paper;
- (4) Find the area of a leaf using graph paper;
- (5) Why do you think so many different languages are spoken in India?

### **Why?**

Ask why an answer is correct, or why something happens or happened. For example:

- (1) Why is  $(7 \times 6) + 3$  less than  $7 \times (6 + 3)$ ?
- (2) Why did Ashoka decide to stop fighting wars?
- (3) Why can turtles run faster than snails?
- (4) Why are trees shorter higher up on mountains?
- (5) Why is .5 the same as .50?
- (6) Why are some trees very tall and others not so tall?
- (7) Why are there rich and poor people?
- (8) Why do some people believe in a god?

### **Explain your answer - Give evidence**

Instead of just asking students for an opinion or an answer that they may just answer yes or no, be sure to ask for an explanation as well.

### **What's the use of learning something?**

- (1) Why should you learn what a gas is?
- (2) Why do you need to know the multiplication table?
- (3) What's the use of studying about the Indus Valley Civilisation?

(4) Why should we learn about the digestive system?

The purpose of asking this kind of question is not only so that the students realise what the use of learning these things is, but also that you can tell whether they understand the topic well enough to analyse it's usefulness.

### **Can you prove it?**

It is not enough just to remember the answer – students should also understand why an answer is correct or incorrect. They should get practice supporting their arguments, giving examples, and justifying their opinions. Even emotional responses can be understood through reasoning.

### **Explain with a picture, diagram, or map**

- (1) Make a diagram to show examples of the social, economic, political, religious, and cultural aspects of life in present day Chandigarh (or in whatever place the students live, or in Agra 20 years ago).
- (2) Make a map to show the location of trees on the school ground. Make annotated diagrams to explain how a bean sprouts and grows.
- (3) Make a graph - Use a graph Look at the following graph and tell what are the main exports of Venezuela.
- (4) Make a graph to show how the female/male ratio changed over the last 80 years in Haryana.
- (5) Does the following graph tell you whether India or Pakistan has more Muslims? (using a graph which actually does not show this - it only shows the relative numbers within each country)

### **Make an outline**

- (1) Make an outline of a particular paragraph (or chapter). Avoid using any complete sentences - use phrases only. Use a hierarchal structure for the outline.
- (2) Before you write a page to answer a question, write an outline of the main points you will write about.
- (3) Outline the process of digestion in humans.

### **Summarise**

- (1) Write one sentence to summarize the third paragraph in the chapter.
- (2) Read the following paragraph and summarise it in one sentence. [Give an entire paragraph in the exam itself - a paragraph none of the students have previously read.]

### **What if.....**

- (1) What if people were covered with fur like some other animals – how would this have changed the course of history?
- (2) What if India still had not gained independence from Britain, how would your life be different?
- (3) What if in your area the monsoon next year starts two months later than usual and also ends two months later than usual, while still having a normal amount of rain?
- (4) What if an oil tanker leaked a large amount of oil off the coast of Juhu?

## **Design**

- (1) Design an experiment to find out whether it is better to brush teeth before or after breakfast.
- (2) Design a method to teach a younger child how to understand simple fractions.
- (3) Design a survey to find out how many people in a community know English.
- (4) Design an experiment to find out the best way to grow rice seedlings.

## **Invent**

- (1) Invent a way to tell a young child how to clean some utensils without using words.
- (2) Invent a way to make your enemy your friend.
- (3) Invent a machine to automatically turn off a tap when a tank is full.
- (4) Invent a computer program to put names in alphabetical order.

## **Observe**

Carefully observe – draw and describe what you observe

- (1) Carefully look at this leaf and draw exactly what it looks like.
- (2) Build a model town with blocks, and draw a map of it as you look at it from above.
- (3) Look at this picture and tell what the people are doing (or wearing, or what tools they are using, or what kinds of houses they live in, or how much money you think they have, or what time of year it is, etc.)

## **Predict**

Make a prediction based on past experience, established laws, or theories. Explain the reasons for your prediction. [When feasible, students can also do experiments to test their predictions.]

- (1) What will happen to a page of your notebook if you immerse it in a container of water?
- (2) What will tomorrow's weather be like?
- (3) What will your mother say if you tell her that you had a fight at school?
- (4) What will happen if the Women's Reservation Bill is passed in Parliament?

## **Use maps**

Instead of just memorising or copying maps, use maps to answer questions and find information.

- (1) Which state has the shortest coastline: Kerala, Tamil Nadu, Karnataka, Maharashtra, or Gujarat?
- (2) Which is farthest south: Delhi, Lucknow, Kolkata, or Jaipur?
- (3) What kind of soil is found in the areas in which a lot of rice grows? (compare the maps of soil types and crops.)

## **Ask questions**

Ask the students to ask questions.

- (1) Ask five questions about the rule of Akbar - questions for which you do not know the answers.
- (2) If you could ask Ashoka 3 questions, what would you ask him?

- (3) If you could ask a child living 500 years ago in Indore five questions, what would you ask?
- (4) Ask a question related to rain. Make sure it is a question for which you do not know the answer.
- (5) Ask a question about these five objects. Try to ask questions that you could answer by doing an experiment.

### **Question answers**

Even if you think an answer to a question is correct, question it. Think more deeply about it. Encourage students to question answers. Question your own answers. Keep asking why.

### **Find the contradictions**

- (1) Here are some quotes from two textbooks. Find contradictory statements. Discuss the reasons why the contradictions are there: is it because the authors did not know the truth or is it because it is difficult to say exactly what is correct because of the inherent nature of the problem?
- (2) Work with your partner to find something you believe which contradicts what your partner believes.

### **Ask open-ended questions**

Ask questions that have more than one correct answer, or that don't have any correct answer. Let students know that you don't know the answers to many questions. This will make the subject seem more interesting to them.

### **Atlas based questions**

Most questions that require students to refer to their atlas will require more than just memory, and will be more interesting.

- (1) Using maps of soil type, crop patterns, and state boundaries, find out whether there is a correlation between soil type and the production of cotton (or rice, or ...).
- (2) Which states have borders that are major rivers?

### **Open book questions**

An easy way to avoid asking questions that are just memory questions is to let students refer to their books and notes when they answer questions. The aim should not just be to make them search for the ready-made answer in the text. Think of questions that do not have ready-made answers in the text.

### **Use the Index and the Table of Contents**

Find information in a book by using its Index and Table of Contents. Ask each student to bring a book from home that has both an Index and a Table of Contents. Pairs of students can take turns asking each other to search for information in the books, and then they can compare notes to see what they found. Students should write down the source of each citation using the proper format.

### **Write rough drafts and final drafts**

Students need lots of practice writing and rewriting. They need to be able to proof read their own writing: finding errors, making improvements, explaining ambiguities, and rewriting. Students can be marked on how well they mark their own papers. [Three marks 5 could be assigned: one for the rough draft, one for finding errors, and one for the final draft.]

## **Work in a group**

Students can be marked for how well they cooperate with each other and work together in a group. Instead of doing an assignment individually, have students work in pairs or small groups of up to 6 students. All the students in the group should get the same marks for the paper.

## **Follow directions - practice listening**

Before you give the directions, warn the students that you will not repeat yourself, so they must listen very carefully. You must speak loud and clear, and slowly, allowing enough time in between each step so that all students can follow.

(1) Give each student a photocopied map. Ask them to draw an X at a particular place. Ask them to trace a route that you describe. You may describe the route in terms of landmarks, using roads, railways, waterways, in terms of directions (turning right or left - or turning N, E, S, W), and/or in terms of distances.

(2) Describe a geometric figure or a geometric scene in words as the students try to draw what you are describing.

(3) Orally ask mathematics sums like, "Subtract 4 from 17, then add 23, then multiply by 3. What do you get?"

## **Do not ask leading questions**

Instead of asking, "Is X true?", ask, "Is X true or false?"

Instead of asking, "Do you agree with X?", ask "Do you agree or disagree with X?"

This is most important in oral discussions when students may think a leading question implies that the teacher expects a certain answer. For example, if a teacher asks, "Did you drink a glass of milk this morning?" the answer will be more likely to be yes, than if the teacher asks, "Did you drink a glass of milk this morning, or did you drink something else?" If a teacher asks "Was Ashoka a good king?" the answer will be more likely to be yes than if the teacher asks, "Was Ashoka a good or bad king?" By phrasing the question in the second way, the students will be more apt to realise that they have more than one option for an answer.

## **Personalise multiple choice questions**

When giving a list of multiple choice answers to a question, it is a good idea to include an answer like, "(e) none of the above. I think \_\_\_\_\_".

## **Give enough choices**

Give at least four choices in a multiple choice question. If you only give two choices, the students have a 50% chance of answering correctly just by guessing - then if 50% of the students get the answer correct, can you assume that you have been a successful teacher?

## **Look at things from a different perspective**

Suppose you were the king, what would you think? – Suppose you were the peasant, what would you think? Students should realise that often their answer will depend on their point of view. They should be aware of their own point of view, and why they have that point of view, and why other people will have different points of view.

Since we often do not get a chance to consider points of view other than the dominant point of view, we need to make special efforts to be sure that the point of view of the downtrodden and of minorities are heard. The best way to do this is to ask students to ask the downtrodden themselves (in case the students are not themselves the downtrodden).

### **Analyse original sources**

(1) Read the following three paragraphs and tell which one was written by a British ruler, which one was written by an Indian ruler, and which one was written by a cotton mill worker. Explain your reasoning in each case. [The three paragraphs are given from original sources.]

### **Questions and sub-questions**

Students often forget to answer all the parts of a question if it includes a number of sub-questions. It may be better to break such a question up into separate questions, or list them out as 4(a), 4(b), 4(c), etc.

### **Analyse and compare newspaper reports**

Collect accounts of one incident from a number of different newspapers and list the similarities and differences. Analyse why they are similar or different. Ask what is the point of view of the reporter and why the reporter has that point of view.

### **Analyse song lyrics**

Lyrics to any kind of songs can be analysed after students listen to the song. (Hand out written copies of the lyrics beforehand.) Students can discuss meanings in small groups and then share with the whole class.

### **Analyse TV shows, films, and other audio-visual materials**

Make sure all the students have seen whatever is being discussed - preferably show the video in the classroom and discuss immediately afterwards.

### **Look for inherent opposing forces**

In everything and every event, there are opposing forces that are pulling in different directions. Students can better understand things by analysing these opposing forces. For example:

- (1) A piece of paper is lying on a table in a locked room in an abandoned house. Describe the opposing forces that will act upon the paper as it lies there for hours, days, months, and years.
- (2) Suppose a servant cleans a house while the owner of the house relaxes on a chair. Describe the opposing forces that have led to this circumstance. Include social, political, economic, cultural, psychological, and other kinds of forces.

### **Look for inherent contradictions**

For each of the following statements, give reasons why it is true, and also give reasons why it is false:

- (1) The sun always rises in the east.
- (2) Water always flows down.
- (3) Heavy objects fall faster than light objects.
- (4) A seed is a living thing.
- (5) A rose is a rose. [Hint: When is a rose not a rose? Before it opens completely? Afterwards?]
- (6) Indians attained independence in 1947.
- (7) Blood is red.

### **Ask about changes**

- (1) How did the plot of land on which your school is built change during the past 50 years?



(2) How has your hair changed over the past few minutes? How has your hair changed over the past few hours? How has your hair changed over the past few days? How has your hair changed over the past few months?

(3) How have the relations between you and your parents changed since you were 2 years old?

(4) Look closely at the set of stones your teacher will give you and analyse how the stones may have changed over time.

(5) Discuss what has possibly happened to the glass of water you drank last night.

### **Ask for interrelations**

Looking for the interrelations and interdependencies between things and processes is one of the fundamental aspects of learning.

(1) What is the relation between rain and railroads?

(2) How does water affect magnetism?

(3) Are rich people dependent on poor people?

### **Ask a more basic question**

Sometimes we forget to look at the larger picture. It is easy to get involved in asking detailed, intricate, or trivial questions and forget about the bigger questions. While asking about the trees, we forget to ask about the forest.

### **Ask for reasoning, not just emotion**

Students should realise the difference between an answer based on emotion and an answer based on reason. Encourage students to let their emotion be guided by reason, rather than letting their reason be guided by emotion.

Thus, it will not be acceptable to answer "Because I like it," or "Because I think so," or "Because I know it." The reasons for knowing or liking or disliking must be analysed. Students must find evidence to support their beliefs. When you ask a question, ask specifically for evidence.

### **Answer in your mother tongue**

If a student is studying an a language other than their mother tongue, it may be useful to ask the student to answer in their mother tongue. Often the student will be able to give a simpler, clearer answer in their mother tongue, especially if they answer orally rather than in writing. The teacher will then be able to assess whether the student is having a problem with language or with understanding or analysing.

### **Which questions?**

Why ask this question or that question? There are many possible questions to choose from. We cannot ask all questions. We need to choose. How do we choose? We need to analyse why we should ask a particular question rather than some other question. We need to analyse the relevance and importance of each question we ask.