

IMPROVING LEARNING THROUGH QUESTIONING

HANDOUTS FOR TEACHERS

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Handout 1: Thinking about why we ask questions

What different types of questions are there?

What different functions do your questions serve?

Which types of questions do you use most frequently?

When you have answered these questions, see a list of possible reasons to use questions in a classroom on the other side of this handout.

Teachers may ask questions for many possible reasons, including the following:

- To interest, engage and challenge.
- To assess prior knowledge and understanding.
- To stimulate recall, in order to create new understanding and meaning.
- To focus thinking on the most important concepts and issues.
- To help students extend their thinking from the factual to the analytical.
- To promote reasoning, problem solving, evaluation and the formation of hypotheses.
- To promote students' thinking about the way they have learned.
- To help students to see connections.

Asking questions alone is not doing formative assessment. In order to do formative assessment the teacher (or students) needs to use the answers to the questions to inform what they do next.

Handout 2: Common mistakes when asking questions

Common mistake	Unintended effect
Asking too many trivial or irrelevant questions.	
Asking several questions at once.	
Asking only closed questions that allow one right/wrong possible answer	
Asking 'guess what is in my head' questions, where you know the answer you want to hear and you ignore or reject answers that are different.	
Asking questions of only the most able or likeable students.	
Asking a question and answering it yourself.	
Not giving students time to think or discuss before responding.	
Simplifying the question when students don't immediately respond.	
Judging every student response with 'well done', 'nearly there' or 'not quite'.	
Ignoring incorrect answers and moving on.	
Assuming the cause of an incorrect answer and not probing deeper to make sure of the cause.	

Handout 3: What types of questions develop thinking and reasoning?

What types of questions seem to develop thinking and reasoning?

Give a few examples.

What are the implications for your practice?

Handout 4: Five principles for effective questioning

1. Plan to use questions that encourage thinking and reasoning

Really effective questions are planned beforehand. It is helpful to plan sequences of questions that build on, and extend, students' thinking. A good questioner, of course, remains flexible and allows time to follow up responses.

2. Ask questions in ways that include everyone

It is very important that everyone is included in thinking about the questions asked. Here are three ways that teachers have tried to achieve this:

- **Use a 'no hands up' rule.** After a few hands have gone up some students stop thinking because they know that the teacher will not ask them. When students have their hands up they too stop thinking as they already have the answer they want. 'No hands up' encourages everyone to keep thinking as anyone may be called upon to respond.
- **Ask questions that encourage a range of responses.** Rather than asking for specific right answers, ask for ideas and suggestions: "How can we get started on this?", "What do you notice about this?" Everyone will then be able to offer a response.
- **Avoid teacher --- student --- teacher --- student 'ping pong'.** Encourage students to listen to and to reply to each other's responses. Aim for a pattern more like: teacher --- student A --- student B --- student C --- teacher.
- **Arrange the room to encourage participation.** Think about where students are sitting – are there some who cannot hear? Can students see and hear one another so that they can respond to the points another student makes? It is often better to sit students in a U---shape, if possible.

3. Give students time to think

The time interval between a teacher asking a question and supplying the answer herself, or following up with an additional question or comment, is commonly called 'wait time'. For many teachers, the mean wait time is less than one second (Rowe, 1974¹). When teachers increase this wait time to between three and five seconds the research shows that students begin to:

- respond at greater length and with greater confidence;
- offer more unsolicited, but appropriate, responses;
- offer more diverse, alternative explanations;
- relate responses to those from other students.

Increasing wait time is difficult. Silence in a classroom can be hard to bear!

- **Talk to students about 'wait time'.** Make sure that students *know* that they must take time to think before responding. (Some teachers even make themselves wait by counting slowly to themselves: "One, two, three, four, got to wait a little more"!))
- **Use "Think --- Pair – Share".** Ask the question, give 10 seconds thinking time and then allow 30 seconds for talking to a partner. After this, everyone should be ready with an answer and they should know that anyone may be asked for what they think.
- **Use mini whiteboards.** Ask the students to spend 30 seconds thinking about the problem and jotting ideas for the solution onto their mini whiteboards. Then ask the students to share the ideas they had for starting the problem.

¹ Rowe, M. (1974). Relation of wait-time and rewards to the development of language, logic, and fate control: Part II-Rewards. *Journal of Research in Science Teaching*, 11(4), 291-308.

4. Avoid judging students' responses

Interestingly, Rowe (1974) found that if a teacher made judgmental comments, even positive ones such as "Well done!", then this negatively affected students' verbal performance even with the lengthened wait times. Task persistence was greatest where verbal rewards were fewer. When a teacher judges every response with 'yes', 'good', 'nearly' and so on, students are likely to reason to themselves:

"The teacher said that was good. That is not what I was going to say. So what I was going to say cannot be good. So I won't say anything."

Ask open questions that permit a greater variety of responses and reply to students with comments that do not close off alternative ideas.

"Thank you for that, that is really interesting. What other ideas do people have?"

5. Follow up students' responses in ways that encourage deeper thinking

The following approaches encourage further thinking and dialogue:

Ask students to repeat their explanation	Can you just say that again?
Invite students to elaborate	Can you just say a little more about that ...
Challenge students to offer a reason	Can you explain why that works?
Cue alternative responses	Can you suggest another way of doing this?
Support with non---verbal interest	Nod head, rotate hand to indicate that you want more ...
Encourage students to speculate.	What would happen if ...?
Make challenging statements	Someone in this group said ... were they right?
Allow rehearsal of responses	Try out the answer on your partner first.
Encourage students to ask questions	Would anyone like to ask Pat a question about that?
Ask students to think aloud	Can you go through that step by step?
Encourage students to make connections	Can you remember something else we did like this ...?
Thinking aloud with students	Let's think this through together ...

Which of these principles do you implement in your own teaching?

Which principles do you find most difficult to implement? Why?

Handout 5: Observing a lesson

Sharing petrol costs

Each day Dan’s mum drives him to school.

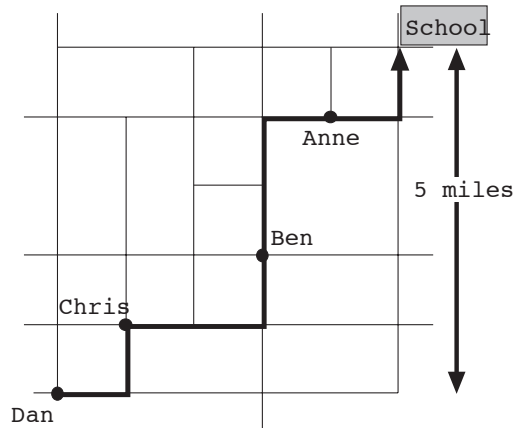
On the way, she picks up 3 of Dan’s friends, Chris, Ben and Anne.

Each afternoon, she returns by the same route and drops them off at their homes.

At the end of a term, the four students decide to pay a sum of £100 towards the cost of petrol.

How should they share out the cost?

Find some reasonable solutions and say which you think is best and why.



This map shows where each person lives and the route taken.

Two reasoned methods are shown below. Which do you consider better?

Method 1:

This is to share the cost in the proportion to the road distance people live from school: 2: 5: 8: 10. So:

Anne pays	£8	Chris pays	£32
Ben pays	£20	Dan pays	£40

Method 2:

Assume that, altogether, people will need to pay \$10 per mile. Costs are shared out as follows:

	Anne	Ben	Chris	Dan
Last 2 miles £20	£5	£5	£5	£5
Next 3 miles \$30		£10	£10	£10
Next 3 miles \$30			£15	£15
Next 2 miles \$20				£20

Anne pays	£5	Chris pays	£30
Ben pays	£20	Dan pays	£50

Which of the two solutions do you consider better and why?

Which of the following principles can you see in Gwen's lesson? Give examples.

- Ask questions that encourage thinking and reasoning.
- Ask questions that include everyone.
- Give students time to think.
- Avoid judging students' responses.
- Follow up students' responses in ways that encourage deeper thinking.