

Pedagogy and Practice: Teaching and Learning in Secondary Schools

Unit 7: Questioning

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*Pedagogy and Practice:
Teaching and Learning in
Secondary Schools*

Unit 7: Questioning

**Senior leaders,
subject leaders
and teachers in
secondary schools**

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Teaching repertoire



How to use this study guide

This study unit offers some practical strategies that teachers use to engage pupils through questioning. The techniques suggested are tried and tested; they draw on both academic research and the experience of practising teachers.

By working through this guide you can build your teaching repertoire step by step, starting with strategies that are easy to implement and moving on to those that will help pupils develop their skills still further. The unit contains 'reflections', to help you reflect on an idea or on your own practice, as well as practical tips and tasks to help you consider advice or try out strategies in your classroom. There are case studies to exemplify particular points, a summary of the research and some suggestions for 'next steps' and further reading. The final page invites you to reflect on the material and to set your personal targets for the future.

You can work through this unit in a number of ways:

- Start small; choose one class to work with. Ask another teacher to help by talking through what you intend to do and to act as a mentor.
- Work with another teacher or group of teachers who teach the same class. Work together on developing your approach to questioning. After three weeks compare notes. Discuss which strategies are the most effective and why.
- Find someone to pair up with and team-teach. Design the tasks together and divide the role of teacher in the lesson between you.
- Work with a small group of teacher-researchers within your school. Use the guide to help you focus your work as a professional learning community.
- Identify sections of the unit that are particularly relevant to you and focus on those.

There is space in this study guide for you to write notes and responses to some of the questions, but you may also find it helpful to keep a notebook handy. For some tasks, you might want to make an audio recording or video of yourself in action so you can review your work more easily. You could add this, along with any other notes and planning that you do as part of your work on this unit, to your CPD portfolio.

The evidence of work you gather in your portfolio could count as points towards accreditation of an MA, or could support your application for membership of a professional body, such as the General Teaching Council of England (GTCE). It could also be used to support an application to reach threshold or Advanced Skills Teacher status.

You will need access to [video sequence 7, Questioning](#), when working through this unit.

Questioning

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Introduction

Effective questioning

Questioning is fundamental to good teaching and learning. When effective questioning is a significant feature of lessons, pupils are more likely to:

- develop a fuller understanding of an idea because they have tried to explain it themselves;
- be clear about the key issues in a lesson;
- easily recall existing knowledge;
- be able to link the ideas in the lesson with their existing knowledge;
- tackle problems at a deep level and be able to extend their thinking;
- engage easily with a task because they are clear about what is expected;
- develop independence in the way they learn and think.

Common issues

Pupils' understanding of ideas is often not as fully developed as the teacher would wish and sometimes it is not clear what the stumbling blocks are. In addition, pupils can spend a significant amount of lesson time off-task. Pupils from highly disadvantaged backgrounds sometimes respond negatively to some forms of questioning because of their lack of self-esteem and their desire to appear 'cool' in front of peers. This is especially true of boys. Modifying the way questions are asked or considering where and when questioning will take place will improve the climate for learning.

Resolving the issues

Effective questioning is a skill that can be learned. All teachers intuitively question pupils for a variety of reasons, but to do it well requires planning and an understanding of how to engage and push pupils' thinking.

What can you do to become an effective questioner?

- Know how to plan questioning for a lesson.
- Understand how questions engage pupils and promote responses.
- Understand how questions develop pupils' cognitive abilities.
- Understand and be able to apply a taxonomy to questioning in your subject.
- Learn the classroom tactics you need to be an effective questioner.
- Know the pitfalls to avoid and how you can plan for alternatives to questions.
- Know how to respond to answers so that pupils are encouraged to participate.

1 Questioning

The interaction between teacher and learners is the most important feature of the classroom. Whether helping learners to acquire basic skills or a better understanding to solve problems, or to engage in higher-order thinking such as evaluation, questions are crucial. Of course, questions may be asked by pupils as well as teachers: they are essential tools for both teaching and learning.

For teachers, questioning is a key skill that anyone can learn to use well. Similarly, ways of helping pupils develop their own ability to raise and formulate questions can also be learned. Raising questions and knowing the right question to ask is an important learning skill that pupils need to be taught.

Research into questioning has given some clear pointers as to what works. These can provide the basis of improving classroom practice. A very common problem identified by the research is that pupils are frequently not provided with enough 'wait time' to consider an answer; another is that teachers tend to ask too many of the same type of questions. There is a [summary of research](#) into questioning at the end of this unit.

The purposes of questioning

Teachers ask questions for a number of reasons, the most common of which are:

- to interest, engage and challenge pupils;
- to check on prior knowledge and understanding;
- to stimulate recall, mobilising existing knowledge and experience in order to create new understanding and meaning;
- to focus pupils' thinking on key concepts and issues;
- to help pupils to extend their thinking from the concrete and factual to the analytical and evaluative;

- to lead pupils through a planned sequence which progressively establishes key understandings;
- to promote reasoning, problem solving, evaluation and the formulation of hypotheses;
- to promote pupils' thinking about the way they have learned.

The kind of question asked will depend on the reason for asking it. Questions are often referred to as 'open' or 'closed'.

Closed questions, which have one clear answer, are useful to check understanding during explanations and in recap sessions. If you want to check recall, then you are likely to ask a fairly closed question, for example 'What is the grid reference for Great Malvern?' or 'What do we call this type of text?'

On the other hand, if you want to help pupils develop higher-order thinking skills, you will need to ask more open questions that allow pupils to give a variety of acceptable responses. During class discussions and debriefings, it is useful to ask open questions, for example 'Which of these four sources were most useful in helping with this enquiry?', 'Given all the conflicting arguments, where would you build the new superstore?', 'What do you think might affect the size of the current in this circuit?'

Questioning is sometimes used to bring a pupil's attention back to the task in hand, for example 'What do you think about that, Peter?' or 'Do you agree?'

The practice of questioning

Questioning is an area characterised by a good deal of instinctive practice. The first task will help you reflect on your use of questioning.

Task 1		Questioning: a self-review		20 minutes
<p>For one lesson you teach, write down, as far as possible, all questions that you ask. To help capture them, you could make an audio recording of yourself or ask another teacher to observe you. (You could do the same for this colleague in return.)</p> <p>Now analyse the questions you have asked, using a grid like the one below. Refer to the list of the purposes of questioning above to help you with the fourth column.</p>				
Question posed	Open	Closed	Evaluation of pupils' responses (impact on learning)	
What do we call the process green plants use to make food?		3	Helped all pupils remember a key word	
Explain the differences between the processes of photosynthesis and respiration.	3		Helped all pupils to process knowledge.	

Read the [summary of research](#) on pages 18–20.

How does your use of questioning compare with the research findings? Look at the list of strategies in the section headed ‘What is effective questioning?’ Highlight those you think are part of your current practice and highlight in another colour those you think would be useful in helping to improve your practice.

Which points in the research confirmed your perceptions? Which points were new to you and which seemed especially interesting? Make a note below of the aspects of questioning that you wish to improve.

Key aspects of questioning to develop

-
-
-
-
-

2 Making a start with questioning – common pitfalls and possible solutions

Although questions are the most common form of interaction between teachers and pupils, it is fair to say that questions are not always well judged or productive for learning. This section identifies some common pitfalls of questioning and suggests some ways to avoid them.

Not being clear about why you are asking the question: You will need to reflect on the kind of lesson you are planning. Is it one where you are mainly focusing on facts, rules and sequences of actions? If that is the case, you will be more likely to ask closed questions which relate to knowledge. Or is it a lesson where you are focusing mainly on comprehension, concepts and abstractions? In that case you will be more likely to use open questions which relate to analysis, synthesis and evaluation.

Asking too many closed questions that need only a short answer: It helps if you plan open questions in advance. Another strategy is to establish an optimum length of response by saying something like ‘I don’t want an answer of less than 15 words.’

Asking too many questions at once: Asking about a complex issue can often lead to complex questions. Since these questions are oral rather than written, pupils may find it difficult to understand what is required and they become confused. When you are dealing with a complex subject, you need to tease out the issues for yourself first and focus each question on one idea only. It also helps to use direct, concrete language and as few words as possible.

Asking difficult questions without building up to them: This happens when there isn't a planned sequence of questions of increasing difficulty. Sequencing questions is necessary to help pupils to move to the higher levels of thinking.

Asking superficial questions: It is possible to ask lots of questions but not get to the centre of the issue. You can avoid this problem by planning probing questions in advance. They can often be built in as follow-up questions to extend an answer.

Asking a question then answering it yourself: What's the point? This pitfall is often linked to another problem: not giving pupils time to think before they answer. Build in 'wait time' to give pupils a chance to respond. You could say 'Think about your answer for 3 seconds, then I will ask.' You could also provide prompts to help.

Asking bogus 'guess what's in my head' questions: Sometimes teachers ask an open question but expect a closed response. If you have a very clear idea of the response you want, it is probably better to tell pupils by explaining it to them rather than trying to get there through this kind of questioning. Remember, if you ask open questions you must expect to get a range of answers. Acknowledge all responses. This can easily be done by saying 'thank you'.

Focusing on a small number of pupils and not involving the whole class: One way of avoiding this is to get the whole class to write their answers to closed questions and then show them to you together. Some teachers use small whiteboards for this. Another possibility, which may be more effective for more open questions, is to use the 'no-hands' strategy, where you pick the respondent rather than having them volunteer. One advantage of this is that you can ask pupils questions of appropriate levels of difficulty. This is a good way of differentiating to ensure inclusion.

Dealing ineffectively with wrong answers or misconceptions: Teachers sometimes worry that they risk damaging pupils' self-esteem by correcting them. There are ways of handling this positively, such as providing prompts and scaffolds to help pupils correct their mistakes. It is important that you correct errors sensitively or, better still, get other pupils to correct them.

Not treating pupils' answers seriously: Sometimes teachers simply ignore answers that are a bit off-beam. They can also fail to see the implications of these answers and miss opportunities to build on them. You could ask pupils why they have given that answer or if there is anything they would like to add. You could also ask other pupils to extend the answer. It is important not to cut pupils off and move on too quickly if they have given a wrong answer.

Practical tips

Be clear about why you are asking the questions. Make sure they will do what you want them to do.

Plan sequences of questions that make increasingly challenging cognitive demands on pupils.

Give pupils time to answer and provide prompts to help them if necessary.

Ask conscripts rather than volunteers to answer questions.

Reflection

Look again at the list of pitfalls and think about your own teaching. Which of these traps have you fallen into during recent lessons?

How might you have avoided them?

3 Engaging the whole class with questioning

When using questioning with the whole class, it is important that the questions are planned in advance and that you are clear about the purpose. It is also important that the questioning does not carry on for too long and that pupils know this. Questioning can involve and engage even those pupils who can be challenging, provided that it is well planned, of interest and makes them think; they need to see that they will learn something.

Task 3

Whole-class questioning

10 minutes

Watch [video sequence 7a](#), which shows a teacher involving the whole class through questioning.

Note the following techniques as you see them:

- telling the class what to expect;
- providing wait time (two different techniques);
- providing a safe environment by allowing pupils to discuss answers with each other first;
- a 'no-hands' rule.

Task 4**Classroom assignment: planning your own questions** 1 hour

Use the four types of good practice shown on the video together with the list of pitfalls to plan a whole-class questioning session for the start of a lesson.

Aim to engage all pupils and think about the following issues:

- How will you tell them what to expect?
- What will be the first question?
- How will you provide wait time?
- How will you provide a safe environment for them to take risks?

Try out your plan in the classroom and evaluate the outcome using the grid below.

Aspect of questioning	Pupil response	What to try next time
Telling pupils what to expect		
Using a planned sequence		
Providing wait time		
Safe environment		
'No-hands' rule		

Planning questions in advance is important, and teachers often plan prompts to help them move through a sequence. It is also important to help pupils build on the ideas of others, and to extend both their answers and their thinking. Using questioning to promote higher-order thinking is dealt with in [section 5](#).

4 Making questioning effective

The way questions are asked is central to their effectiveness. All pupils, including challenging ones, respond well to teachers who show an interest in them and in their opinions and ideas.

‘It’s all to do with respect ... It’s those who are more of a person ... with some teachers you can have a conversation.’ (Year 11 pupil, Croydon)

The way you ask a question or listen to a response is vital. Good questioners tend to show genuine curiosity in the way they ask questions, inviting pupils to think with them, for example ‘I wonder why we can’t compress liquids yet we can gases’ or ‘How could we find out if these figures are correct?’ The way in which you respond to pupils’ answers is also crucial.

Classroom tactics for effective questioning

Creating a climate where pupils feel safe to make mistakes: This is very important if pupils are going to build the confidence to speculate and take risks. Some teachers use small whiteboards for pupils’ answers to simple questions. All pupils write the answer at the same time and hold it up so that the teacher can see. This avoids making pupils feel vulnerable. It is important that pupils’ contributions are listened to and taken seriously by both the teacher and the class. You should model this by ensuring that you make appropriate responses to contributions and are not critical. It is also important that you do not allow the class to ridicule wrong answers. Boys in particular do not like to be shown to be wrong. You could also model making mistakes yourself to show that being wrong is acceptable.

Using a ‘no-hands’ rule: This tactic can contribute to creating a supportive classroom climate. It ensures that all pupils are likely to be asked for a response and makes the questioning process more inclusive. If you only ever ask people with their hands up, it limits who is included and can leave some pupils disengaged from the process. The ‘no-hands’ tactic also lets you direct questions where you want and to pitch a question at the appropriate level to extend the pupil you are asking. If you are asking conscripts rather than volunteers, you need to have a range of back-up strategies if the pupil is unable to answer. Such strategies could include allowing them to say ‘pass’ or to seek help from a friend.

Probing: When pupils respond to a question, probes are useful follow-ups and can be used to seek more information, to clarify responses or to get pupils to extend their answers. Questions such as ‘Can you tell me more about that?’ or ‘What do you think the next step would be?’ are probes that can move pupils’ thinking on.

Telling pupils the big question in advance: This helps to reinforce the main ideas and concepts and gives pupils time to prepare for the question as they work through the lesson. You could also provide signals to help pupils recognise the range of possible responses to the question being asked and to help them to select the most appropriate one.

Building in wait time: Research suggests that if the teacher waits about 3 seconds, both before a pupil answers a question and also before speaking after the answer, there are substantial benefits in the classroom. It is likely to:

- encourage longer answers;

- encourage a greater number and variety of responses;
- encourage more confidence and ‘risk taking’;
- encourage pupils to ask questions in return.

Allowing time for collaboration before answering: Asking pairs of pupils to consider the question for a set period of time before seeking answers leads to more thoughtful and considered answers. It can also promote engagement by giving pupils a very immediate context for their work.

Placing a minimum requirement on the answer: Saying something like ‘Do not answer this in less than 15 words’ will begin to produce longer responses.

Dealing with answers

Dealing well with pupils’ answers is a very important aspect of effective questioning. The overuse or inappropriate use of praise should be avoided and pupils should be made aware if their answer is not correct. This is particularly true if the answer reveals misconceptions.

If the answer is correct: You must acknowledge this but you should avoid effusive praise. If the answer is a particularly good one, you might indicate why it is so good or ask other pupils what they think. If the pupil is hesitant, they will need a greater degree of affirmation than someone who is confident in the answer.

If the answer is incorrect: If this is because of a lack of knowledge or understanding, you could simplify the question or provide a series of prompts to encourage the pupil to try a better answer. If this doesn’t work, then you could try to clarify the underpinning knowledge or provide a partly correct answer for them to try completing. This can help to clarify misconceptions and can also involve other pupils in the discussion.

If the answer is partly correct: You should acknowledge the parts which are correct and then use prompts to deal with the incorrect parts.

If an answer is a result of speculation: You should accept all answers as being of equal worth. Then collaborate on finding which are more likely to be correct. The way you ask the question in the first place should indicate that all answers are acceptable at this stage. Asking, at the start of an investigation, ‘What factors *might* affect the rate of photosynthesis?’ is much better than ‘What factors affect the rate of photosynthesis?’

Reflection

Which of these tactics could help you improve your own practice?

Alternatives to direct questions

Sometimes teachers use questioning when other teaching strategies, such as explanation, would be more appropriate. Below are some alternatives to questioning which could be used as additional tools to develop pupils' learning.

Explore a statement: Rather than asking pupils a direct question, give them a statement and invite them to discuss, perhaps first in pairs and then in fours, what it means. The statement could be correct or false or ambiguous, for example 'There is no gravity in space', 'Erosion is a process that is happening all the time', 'To be able to design hats you do not need a good understanding of materials.'

Paint the picture: This is particularly useful for exploring abstract ideas. Ask pupils to draw how they picture an idea they have in their minds. You might say, for example, 'So the energy in the battery is transferred around the circuit to the bulb and then to the air by light and heating. What is in your head? How do you picture this? Draw it.'

Invite pupils to elaborate: Phrases such as 'Would you say a little more about that?' or 'I'm not sure what you mean' are useful in getting pupils to expand and develop a comment.

Speculate about the subject under discussion: Saying things like 'I wonder what would happen if ...' can help pupils to think around an issue.

Make a suggestion: You could offer alternative ways of carrying out a task. This may be more practical during small-group work than with a whole class.

Offer extra information: Providing extra information during a problem-solving activity can be useful in stimulating pupils' thinking.

Reinforce suggestions from pupils: Try developing a comment made by a pupil by saying something like 'I really liked ... because ...'.

Clarify ideas: Saying something like 'We can tell that this is the case because ...' helps to reinforce learning by focusing sharply on the main issues under consideration.

Repeat comments and summarise: When you want to reinforce important points that have been made, it helps to restate or summarise them in a slightly different form.

Task 5**Classroom assignment: putting it into practice****30 minutes**

Choose two or three tactics from the list on pages 8–9. Try them out in a lesson and assess the response of the pupils. You may feel self-conscious until you become familiar with doing them. Pupils, too, may find the approaches unusual and will take time to get used to them.

Try to complete a lesson record as you try out each tactic. You can adapt the example below to meet your needs. It is useful to make an audio recording of your lesson or have another teacher observe you so you can reflect on it later.

Tactic	Pupils' response: first try	Pupils' response: second try	Pupils' response: third try	Pupils' response: fourth try	Pupils' response: fifth try
Using a 'no-hands' rule					
Building in wait time					
Giving the big question in advance					
Allowing pupils time for collaboration					
Placing a minimum requirement on the length of an answer					
Allowing all pupils to write an answer at the same time and show you together					
Using probes and prompts					

5 Planning sequences of questions to promote thinking

If you are going to use questioning to improve what and how pupils learn, you need to be able to formulate different kinds of question: both the closed, product type of question and the open, process type. As you begin to plan in this way, it is a good idea to write down the main questions that you will use in a lesson. The questions you plan will need to be in sequences of increasing difficulty. In addition, you will need to ask questions of different degrees of cognitive complexity in order to challenge pupils and help them to develop their thinking. You will need to consider your objectives for the lesson to ensure that this challenge is built in and that the questions you plan are closely linked to the objectives.

Bloom's taxonomy

Bloom's taxonomy (see the [summary of research](#)) is very useful both in planning objectives and in planning increasingly challenging questions. The taxonomy classifies educational objectives into groups according to the level of cognitive complexity involved and kind of thinking needed to meet the objectives.

Bloom assumed that the objectives could be placed in a hierarchical sequence, from knowledge (the least complex kind of objective) to evaluation (the most complex and the one that demands higher-order thinking).

In summary, Bloom's taxonomy suggests that people first need to acquire knowledge before they can understand the knowledge. They need to be able to understand the knowledge before they can apply it to different contexts. They need to be able to apply knowledge before they can analyse, question or infer from the knowledge. Only when they have done that can people combine different kinds of knowledge to create new knowledge. Finally, when a person is able to combine knowledge in this way, they are then able to evaluate. Moving between these stages demands increasingly complex thinking on the part of the learner.

You can use the steps in the taxonomy to help plan objectives for lessons over a period of time to ensure that lessons are making increasingly challenging cognitive demands on pupils. You can also use them to plan sequences of questions in a lesson. By sequencing questions in this way, you can help pupils to deepen their understanding, to develop their thinking skills and to become more effective learners.

The following chart links the steps in Bloom's taxonomy with the types of task pupils might be expected to do and the kinds of question that would help them in those tasks. There are many possible generic question stems; just a few examples are given for each objective.

Cognitive objective	What pupils need to do	Links to thinking	Possible question stems
Knowledge	Define Recall Describe Label Identify Match	Pupils are more likely to retain information if it is needed for a specific task and linked to other relevant information. Do your questions in this area allow pupils to link aspects of knowledge necessary for the task?	Describe what you see ... What is the name for ... What is the best one ... Where in the book would you find ... What are the types of graph ... What are we looking for? Where is this set?
Comprehension	Explain Translate Illustrate Summarise Extend	Comprehension questions require the pupils to process the knowledge they already have in order to answer the question. They demand a higher level of thinking and information processing than do knowledge questions.	How do you think ... Why do you think ... What might this mean ... Explain what a spreadsheet does ... What are the key features ... Explain your model ... What is shown about ... What happens when ... What word represents ...
Application	Apply to a new context Demonstrate Predict Employ Solve Use	Questions in this area require pupils to use their existing knowledge and understanding to solve a new problem or to make sense of a new context. They demand more complex thinking. Pupils are more likely to be able to apply knowledge to a new context if it is not too far removed from the context with which they are familiar.	What shape of graph are you expecting? What do you think will happen? ... Why? Where else might this be useful? How can you use a spreadsheet to ...? Can you apply what you now know to solve ...? What does this suggest to you? How does the writer do this? What would the next line of my modelled answer be?
Analysis	Analyse Infer Relate Support Break down Differentiate Explore	Analysis questions require pupils to break down what they know and reassemble it to help them solve a problem. These questions are linked to more abstract, conceptual thought which is central to the process of enquiry.	Separate ... (e.g. fact from opinion) What is the function of ... What assumptions are being made ... What is the evidence ... State the point of view ... Make a distinction ... What is this really saying? What does this symbolise? So, what is the poet saying to us?

Table continues

Synthesis	Design Create Compose Reorganise Combine	Synthesis questions demand that pupils combine and select from available knowledge to respond to unfamiliar situations or solve new problems. There is likely to be a great diversity of responses.	Propose an alternative ... What conclusion can you draw ... How else would you ... State a rule ... How do the writers differ in their response to ... What happens at the beginning of the poem and how does it change?
Evaluation	Assess Evaluate Appraise Defend Justify	Evaluation questions expect pupils to use their knowledge to form judgements and defend the positions they take up. They demand very complex thinking and reasoning.	Which is more important/moral/logical ... What inconsistencies are there in ... What errors are there ... Why is ... valid ... How can you defend ... Why is the order important? Why does it change?

Task 6

Which category?

10 minutes

You could try this task by yourself or do it with another teacher.

Look at the list of questions and question stems below and decide which objective in Bloom's taxonomy each relates to. Write the question numbers under the headings in the first column of the grid above.

- 1 Which of these three tools would do that most effectively and why?
- 2 What name did we give to ...?
- 3 Why do you think the indigenous peoples of what is now South America had no word for 'season'?
- 4 Why do you think the indigenous peoples of what is now South America might have no word for 'season' in their native languages?
- 5 What does this style of painting remind you of?
- 6 What do you think is the main point the writer is making in the second paragraph?
- 7 Which of these four sources might be most reliable in helping us to ...?
- 8 Now, the difficult bit. Given all the conflicting arguments, where would you build the new refinery?
- 9 What would happen if you mixed ...?
- 10 What choices did Harold have when faced with that situation?
- 11 Which words in this sentence do you already know?

Task continues

- 12 Given all of the sources we have looked at, where would you now expect these people to have moved to?
- 13 If we are unsure, how could we set about translating ...?
- 14 Why did the Normans invade ...?
- 15 What similarities can you spot between the two ...?
- 16 If this verb looks like this when it follows 'il', what would you expect of these verbs?
- 17 What repeating pattern can you see in the events ...?
- 18 How will you set about remembering what you have learned?

You will find some suggested answers on page 24.

As you will realise, the questions that are asked in relation to the cognitive objectives in Bloom's taxonomy can be put into two main categories:

- **Those which are mainly about factual knowledge and its understanding and application:** These questions demand mainly concrete thinking and fall into the first three areas of the taxonomy. Questions in this category will have a limited number of possible answers. They are sometimes called 'convergent questions'.
- **Those which are mainly about problem solving and the manipulation of knowledge:** These questions demand mainly abstract thought and require understanding and use of concepts as well as the ability to see patterns and processes. They fall into the last three areas of the taxonomy. Questions in this category are likely to produce a wide diversity of responses and possible answers. They are sometimes called 'divergent questions'.

Task 7

Planning a questioning sequence to promote thinking 1 hour

First watch [video sequence 7b](#), which shows an English teacher working with a Year 10 mixed-ability group. Watch how she increases the demand, moving from concrete questions to abstract ones. Notice also how she increases and reduces demand in response to individual pupils, changing from abstract to concrete if a pupil struggles to respond.

Note down some of the questions she uses and then use the grid on pages 13–14 to work out which of Bloom's cognitive objectives each one matches.

Now use Bloom's taxonomy to plan a sequence of questioning you can use in a lesson that you will teach soon. You might like to plan the sequence with someone in your own department and then both try it out.

Evaluate how effective it was and consider what you might do next time to improve the sequence. You might find it helpful to reflect on the pitfalls to questioning on pages 4–5.

Once you have tried this a few times, it is a good idea to build banks of questions into your schemes of work.

6 Helping pupils develop the ability to raise their own questions

Being able to raise questions to explore a problem or to find an answer is a key learning skill. You can help pupils develop their ability to raise questions by giving them explicit teaching on how to do this.

Model the process: Talk through with pupils the process of formulating questions to ask in order to explore or investigate an idea, thus making explicit your thought processes. For example, a teacher might say:

‘I want to find out the best metal to use for connecting wires in an electrical circuit. I need to think first about what I mean by “best”, because I can’t investigate that to find an answer. The best metal will conduct electricity well and be flexible enough when it’s in a wire form. So maybe the questions I need to ask are: “What are the conductivities of these metals?” and “How easily do they bend?”’

Pupils can be taken step by step through the process of reformulating a question into a form that can be investigated.

Generate questions together: Start with a problem and discuss with pupils what questions are needed to find an answer. For example, a teacher might say:

‘If we want to find out what happened to Thomas à Becket, what questions do we need to ask? Discuss this in pairs; you have 3 minutes and then I will take some of your questions.’

You could then gather a number of questions on the board, grouping types appropriately and discussing which are most likely to provide information and why. This could be followed by discussion on where you would look to find answers.

Use generic questions: Point out that there are many effective generic open-ended questions such as ‘What do you notice?’, ‘What would happen if ...?’, ‘Is there a quicker way of doing this?’ You could suggest that pupils use some of these questions to explore an object or event. You could use Bloom’s taxonomy to generate a list. It is best to employ only a few at any one time.

Play 20 questions: Allocate pupils to small groups (e.g. three) and provide each group with different information on something they are studying – for example, in history, they could be given the differing views of the king, the church and parliament on a particular issue. Then ask them to form big groups, each comprising three of the small groups. Two of the small groups have to ask questions of the other to get their information. The pair that ‘wins’ is the one that asks the fewest questions. The groups swap round so they all get a turn at being questioned.

Explore a new topic: Tell pupils what the new topic is about and ask them to identify what they already know. Make a note of these points and then ask pupils, perhaps working in groups at first, to generate a number of questions about the topic they would like to explore further. You could use some question stems from the grid on pages 13–14 to use as prompts.

KWL grids

A KWL grid is a useful way for pupils to identify what they already know, generate questions and record answers.

What I know	What I want to know	What I have learned
People over 18 can vote in elections in Britain.	Are there any people over 18 who are not allowed to vote?	<p>These people can't vote in elections:</p> <ul style="list-style-type: none"> • Members of the House of Lords • prisoners • patients in mental hospitals • people who have committed corrupt actions in elections in the last 5 years • people who are citizens of the European Union or other countries (except for citizens of the Republic of Ireland and Commonwealth countries resident in Britain) • people who can't make a reasoned judgement

Task 8

Classroom assignment: generating questions

1 hour

Choose an area of work where it would be appropriate for pupils to generate their own questions. Try out one of the suggestions above and evaluate its effectiveness.

Try to complete a lesson record as you try out each tactic. You can adapt the example below to meet your needs. It is useful to make an audio recording of your lesson or have another teacher observe you so you can reflect on it later.

Tactic	Pupils' response: first try	Pupils' response: second try	Pupils' response: third try	Pupils' response: fourth try	Pupils' response: fifth try
Modelling the process					
Generating questions together					
Using generic questions					
Playing 20 questions					
Exploring a new topic					

Summary of research

Effective questioning

Research evidence suggests that effective teachers use a greater number of open questions than less effective teachers. The mix of open and closed questions will, of course, depend on what is being taught and the objectives of the lesson. However, teachers who ask no open questions in a lesson may be providing insufficient cognitive challenges for pupils.

Questioning is one of the most extensively researched areas of teaching and learning. This is because of its central importance in the teaching and learning process. The research falls into three broad categories:

- What is effective questioning?
- How do questions engage pupils and promote responses?
- How do questions develop pupils' cognitive abilities?

What is effective questioning?

Questioning is effective when it allows pupils to engage with the learning process by actively composing responses. Research (Borich 1996; Muijs and Reynolds 2001; Morgan and Saxton 1994; Wragg and Brown 2001) suggests that lessons where questioning is effective are likely to have the following characteristics:

- Questions are planned and closely linked to the objectives of the lesson.
- The learning of basic skills is enhanced by frequent questions following the exposition of new content that has been broken down into small steps. Each step should be followed by guided practice that provides opportunities for pupils to consolidate what they have learned and that allows teachers to check understanding.
- Closed questions are used to check factual understanding and recall.
- Open questions predominate.
- Sequences of questions are planned so that the cognitive level increases as the questions go on. This ensures that pupils are led to answer questions which demand increasingly higher-order thinking skills but are supported on the way by questions which require less sophisticated thinking skills.
- Pupils have opportunities to ask their own questions and seek their own answers. They are encouraged to provide feedback to each other.
- The classroom climate is one where pupils feel secure enough to take risks, be tentative and make mistakes.

The research emphasises the importance of using open, higher-level questions to develop pupils' higher-order thinking skills. Clearly there needs to be a balance between open and closed questions, depending on the topic and objectives for the lesson. A closed question, such as 'What is the next number in the sequence?', can be extended by a follow-up question, such as 'How did you work that out?'

Overall, the research shows that effective teachers use a greater number of higher-order questions and open questions than less effective teachers. However, the

research also demonstrates that most of the questions asked by both effective and less effective teachers are lower order and closed. It is estimated that 70–80 per cent of all learning-focused questions require a simple factual response, whereas only 20–30 per cent lead pupils to explain, clarify, expand, generalise or infer. In other words, only a minority of questions demand that pupils use higher-order thinking skills.

How do questions engage pupils and promote responses?

It doesn't matter how good and well structured your questions are if your pupils do not respond. This can be a problem with shy pupils or older pupils who are not used to highly interactive teaching. It can also be a problem with pupils who are not very interested in school or engaged with learning. The research identifies a number of strategies which are helpful in encouraging pupil response. (See Borich 1996; Muijs and Reynolds 2001; Morgan and Saxton 1994; Wragg and Brown 2001; Rowe 1986; Black and Harrison 2001; Black et al. 2002.)

Pupil response is enhanced where:

- there is a classroom climate in which pupils feel safe and know they will not be criticised or ridiculed if they give a wrong answer;
- prompts are provided to give pupils confidence to try an answer;
- there is a 'no-hands' approach to answering, where you choose the respondent rather than have them volunteer;
- 'wait time' is provided before an answer is required. The research suggests that 3 seconds is about right for most questions, with the proviso that more complex questions may need a longer wait time. Research shows that the average wait time in classrooms is about 1 second (Rowe 1986; Borich 1996).

How do questions develop pupils' cognitive abilities?

Lower-level questions usually demand factual, descriptive answers that are relatively easy to give. Higher-level questions require more sophisticated thinking from pupils; they are more complex and more difficult to answer. Higher-level questions are central to pupils' cognitive development, and research evidence suggests that pupils' levels of achievement can be increased by regular access to higher-order thinking. (See Borich 1996; Muijs and Reynolds 2001; Morgan and Saxton 1994; Wragg and Brown 2001; Black and Harrison 2001.)

When you are planning higher-level questions, you will find it useful to use Bloom's taxonomy of educational objectives (Bloom and Krathwohl 1956) to help structure questions which will require higher-level thinking. Bloom's taxonomy is a classification of levels of intellectual behaviour important in learning. The taxonomy classifies cognitive learning into six levels of complexity and abstraction:

- 1 Knowledge – pupils should: describe; identify; recall.
- 2 Comprehension – pupils should: translate; review; report; restate.
- 3 Application – pupils should: interpret; predict; show how; solve; try in a new context.
- 4 Analysis – pupils should: explain; infer; analyse; question; test; criticise.

- 5 Synthesis – pupils should: design; create; arrange; organise; construct.
- 6 Evaluation – pupils should: assess; compare and contrast; appraise; argue; select.

On this scale, knowledge is the lowest-order thinking skill and evaluation is the highest. It is worth pointing out that, in most cases, pupils will need to be able to analyse, synthesise and evaluate if they are to attain level 5 and above in the National Curriculum and Grade C and above at GCSE.

Bloom researched thousands of questions routinely asked by teachers and categorised them. His research, and that of others, suggests that most learning-focused questions asked in classrooms fall into the first two categories, with few questions falling into the other categories which relate to higher-order thinking skills.

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- Black, P. and Harrison, C. (2001) 'Feedback in questioning and marking: the science teacher's role in formative assessment'. *School Science Review* 82 (June) 43–49.
- Black, P. et al. (2002) *Working inside the black box: assessment for learning in the classroom*. King's College, London. ISBN: 1871984394.
- Bloom, B. S. and Krathwohl, D. (1956) *Taxonomy of educational objectives: the classification of educational goals*. Handbook 1: *Cognitive domain*. Addison Wesley. ISBN: 0582323878.
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- Wragg, E. C. and Brown, G. (2001) *Questioning in the secondary school*. Routledge. ISBN: 014524952X.

Next steps

This unit has explored an aspect of teaching and learning. You may wish to develop your ideas further, to consolidate, apply ideas in different contexts or explore an aspect in more depth and innovate.

Reflect

What have been the key learning points for you?

What has been the impact on pupils?

Here are some suggestions as to how you may develop practice further:

- Work with other teachers to develop a question bank for your subject using Bloom's taxonomy, and add it to the scheme of work. First, check the main objectives for each unit of work. Do they focus mainly on the first three of Bloom's cognitive objectives – knowledge, comprehension and application? If they do, how can you build in objectives which relate to the last three of Bloom's objectives – analysis, synthesis and evaluation? Now, take a small section of the scheme, such as might be taught in two or three lessons, and talk about the kinds of learning and thinking that are needed to meet the objectives. Then start to plan the types of question which would allow this to happen.
- Following a whole-class episode, pupils are often expected to work in groups or individually, after having been given some instructions. Whilst appearing to, pupils may not understand as well as you would wish. Circulating and asking three focusing questions of each group/individual can help. These are:
 - What are you trying to find out / do?
 - What do you think the answer is likely to be / will happen?
 - Why?

Investigate the impact of these three questions on pupils' understanding in a range of different classes. Does this help?

- Using a grid such as in [task 1](#), investigate whether your questioning changes with the maturity of the pupils. To help complete the grid some teachers used a teacher assistant, whilst others used three pupils in a class to separately record the number and type. Does the nature of questioning change between Key Stages 3 and 4? Are they sufficiently challenging at all ages?
- Explore further how you might help pupils raise their own questions. Work with a colleague to explore what methods other than those in [task 8](#) you could use. How will you evaluate the impact?

For further reading, the following publications are recommended:

- Assessment Reform Group (1999) *Assessment for learning: beyond the black box*. University of Cambridge, Faculty of Education. ISBN: 0856030422.
- Black, P. and Harrison, C. (2001) 'Feedback in questioning and marking: the science teacher's role in formative assessment'. *School Science Review* 82 (June) 43–49.
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- Borich, G. D. (1996) *Effective teaching methods* (esp. ch. 8, Questioning strategies). Prentice Hall. ISBN: 002312461X.
- DfES Key Stage 3 Strategy training materials:
 - *Assessment in science*, session 4, Developing effective teacher questioning.
 - *Misconceptions in Key Stage 3 science*, session 3, Particles.
 - *Training materials for the foundation subjects*, module 4, Questioning.
- Morgan, N. and Saxton, J. (1994) *Asking better questions: models, techniques and classroom activities for engaging students in learning*. Pembroke. ISBN: 1551380455.
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Setting future targets

Having considered your next steps, you may wish to set yourself some personal targets to support your own continuing professional development. You could use these ideas to inform your performance management discussion.

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Task 9

Setting your targets

40 minutes

When setting targets for the future you may want to discuss the possibilities with a colleague or your line manager.

Whatever you decide to do, you will need to consider the following.

- What are your objectives for the next year?
- What are the expected outcomes in terms of pupils' achievements?
- What strategies will you employ to achieve these outcomes?
- How will you track progress over the year?
- How will you know whether you have been successful or not?

Suggested answers for task 6

Below is a set of possible answers for [task 6](#); it can be argued that some of the questions could be categorised differently.

Bloom's taxonomy	Questions
Knowledge	2, 3, 11
Comprehension	10, 14, 15
Application	5, 9, 13, 16, 18
Analysis	4, 17
Synthesis	6, 12
Evaluation	1, 7, 8

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