

# ***'How do they walk on hot sand?'***

*Using questions to help pupils learn*

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**APPENDICES** *Resources for developing good questioning*

# ***‘How do they walk on hot sand?’***

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***“Judicious questioning is nearly half the learning.”***

*Jerome Bruner*

### **Introduction**

The ways in which teachers use language, and in particular, use questions, can have immediate and long – term effects on behaviour and learning. Teachers ask pupils questions primarily to discover what they know in order to teach them accordingly. Other reasons frequently given for using questions are to:

- help recall,
- develop thinking and imagination,
- encourage pupils to verbalise their knowledge,
- promote reflection, analysis or enquiry and
- deepen understanding.

To fulfil these purposes questions need to offer an intellectual challenge to pupils. In practice this is not necessarily the case, as the questions that teachers ask may often restrict intellectual activity and save pupils the effort of having to think for themselves. Asking the right question has been called the essence of good teaching as it can act as the bridge between teaching and learning. A good question can stimulate pupils to move on to a more advanced stage in their thinking and provide the ‘scaffolding’ for new learning. But not all questions facilitate learning. What differentiates good questioning from that which is unproductive emerged as a clear issue from the survey of classroom assessment in Suffolk undertaken in 1999 (1)

To follow up the survey, teachers from primary, secondary and special schools in Suffolk undertook action research in the spring of 2000. This work set out to determine what made questioning effective. The outcomes proved productive and enabled those involved, and, in many cases, their colleagues as well, to reflect critically on their questioning techniques. Arising from it were practical suggestions for improving these techniques, but also concerns that often it is the teacher who undertakes most of the questioning, and the pupils concentrate on giving answers.

In the autumn of 2000 a small sample of volunteer first and middle schools were involved in follow - up action research. This focused on determining whether teachers were encouraging pupils to ask questions, how they were doing this, and whether the pupils’ own questioning was having an impact on their learning.

This booklet draws on the excellent work of both of these groups of teachers. Thanks are due to the following schools for the time, enthusiasm and commitment that they gave to the research:

Albert Pye Primary  
All Saints CEVA Primary,  
Newmarket  
Beyton Middle School  
Broke Hall Primary  
Bosmere Primary School  
Castle Hill Junior School

Claydon High School  
Great Whelnetnam CE Primary  
Gunton Primary  
Heathside School  
Hillside School, Sudbury  
Leiston High School

Stowmarket Middle  
Shotley Primary  
Thomas Wolsey School  
Wells Hall Primary  
Whitton Green Primary

Liz Depper, Assessment Officer  
October 2001

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**APPENDICES** *Resources for developing good questioning*

## **What makes questioning effective?**

### ***Ten top tactics***

*Participation, interest and effective thinking and learning are affected by the questions that both teachers and their pupils ask. The quality of classroom questioning and its effectiveness can be improved in a number of ways:*

- Prepare key questions to ask;
- Ask fewer and better questions;
- Use appropriate language and content;
- Distribute questions around the class;
- Give pupils “thinking time” to respond to questions, and pause between them;
- Use questions to make progressive cognitive demands;
- Prompt pupils, give cues;
- Use pupils’ responses ~ even incorrect ones;
- Encourage pupils to ask questions;
- Listen, and acknowledge pupils’ responses positively.

## Prepare key questions to ask

**“The children were each asked questions... these had been carefully planned to help them to respond.”** *Teacher observing her colleague in the nursery class at a school for children with severe learning difficulties.*

Every teacher recognises the value of planning and its contribution to the success of her / his classroom practice. Similarly, all questioning strategies depend on good lesson planning and a clear knowledge of where the teacher wants the topic to go. This is particularly important if questioning is to be the main vehicle for learning. The first step is to identify the learning intentions (objectives). Then to decide upon three, possibly four **key questions** that you want the pupils to think about. The acronym **IDEA** is useful for developing and using key questions:

- I** Identify the key questions in relation to the learning intentions.
- D** Decide on the level and order (timing) of the questions.
- E** Extend the key questions with subsidiary questions to ask.
- A** Analyse the answers you are given and decide on ‘follow – up’ responses.

After Brown and Wragg (2)

In practice using the above might result in a plan that looked something like this:

<b>Topic</b>	<i>History of the Second World War</i>
<b>Theme for the lesson</b>	<i>The evacuation &amp; how it affected people’s lives</i>
<b>Learning intentions</b>	<i>To help pupils understand what evacuation meant to those involved.</i>  <i>To show that situations like this are open to interpretation and are not clear – cut.</i>
<b>Resources</b>	<i>Photographs, books, posters</i>
<b>Key and additional questions</b>	<ol style="list-style-type: none"><li><b>1. Why was evacuation considered so important to the war effort?</b><ul style="list-style-type: none"><li>- <i>relieving stress?</i></li><li>- <i>economically?</i></li><li>- <i>morale?</i></li></ul></li><li><b>2. Using the evidence, what can you deduce about how it felt?</b><ul style="list-style-type: none"><li>- <i>to be an evacuee?</i></li><li>- <i>to have your children evacuated?</i></li><li>- <i>to receive an evacuee?</i></li></ul></li><li><b>3. What were the drawbacks to evacuation?</b><ul style="list-style-type: none"><li>- <i>for evacuees?</i></li><li>- <i>for their families?</i></li><li>- <i>for those who hosted them?</i></li><li>- <i>for the government?</i></li></ul></li><li><b>4. What alternatives might there have been? What would you have done had you been a politician at the time?</b></li></ol>

Not every lesson will require 'in – depth' planning of questions. However, noting, asking and returning to a small number of key ones will help to establish with pupils the learning that any lesson set out to achieve. This was summed up by a teacher in a special school who wrote 'Planned questions were used to encourage the whole class to stay 'on task', not just the children whose turn it was. These were used as reinforcement of the learning intentions and the concepts being taught'.

A '**mind map**' is another way of using questions to structure, develop and eventually summarise a lesson. The teacher writes down the theme of the lesson on the centre of paper, wall or whiteboard and draws lines radiating from the theme. On these lines questions are written relating to the theme. At the end of each question line, further lines and questions may be drawn, supplying the basis for collecting thoughts and ideas about the topic. Tasks, opportunities for investigations, research and further learning can be built into this structure. (See Fig. 1)

**Fig. 1** Mind map example



Questions need to be **embedded** when a learning experience starts: "By the end of this morning we'll be able to answer the following questions..." "What would it be like if we knew whether...?", "Before the end of this work we'll be able to.." Research (3) into human memory indicates that when a learner is thinking, s/he processes for an answer in a variety of ways and at conscious and unconscious levels. We talk of having someone (or some thing's) name on the 'tip of the tongue'. We attempt consciously to retrieve the name, fail to do so and eventually give up. Then later, in an unrelated situation and when we're not seeking resolution, the name comes back. Embedding questions at the outset and during a learning experience can harness the same phenomenon.

In summary:

- **Be clear about your learning intentions** – link your key questions directly to them.
- **Plan a few key questions to use** – keep to a maximum of four.
- **Embed the key questions early in the lesson** – so that they become a focus for the recall of learning.

# Ask fewer and better questions

“Why am I asking this question?” *High school geography teacher.*

Teachers ask a lot of questions, probably too many. One study (4) has shown that a group of teachers asked, on average, more than 300 questions in a day. These findings were reflected in research into questioning by Suffolk schools. In tallies of questions used in the classroom, teachers frequently posed 6 to 12 times the number that pupils asked. Research (4, 5) has also demonstrated that the more pupils were questioned, the less initiative they showed in their responses. Most of the questions recorded in the studies were of the closed variety, i.e. ‘What is it called?’ ‘Where did it come from?’ ‘What colour is it?’ Classroom observations that focus on teachers’ questioning patterns and skills suggest a **‘closed or ‘open’ approach**. An open question permits a range of responses, and solicits opinion, but a closed one implies that the teacher has a predetermined ‘correct’ response in mind.

**CLOSED** ←————→ **OPEN**

Another to describe the two question types might be:

**RECALL** ←————→ **THOUGHT**

Here, the choice is between question that draws on knowledge that the pupil already has, and one that requires them to pursue the topic on their own behalf.

The **closed (recall) approach** is more suitable for ‘what’, ‘who’, ‘where’ and ‘when’ questions. The danger is that these may take the form of ‘guess what’s in the teacher’s mind’ questions. When too easy, a volley of ‘What is this...?’ ‘What is that...?’ ‘What is the other..?’ results. When they are too hard, the teacher frequently ends up answering herself:  
‘What is a frog?’  
(No answer)  
‘It’s an am..... amph..... amphib..... amphibian!’

The **open (thought) approach** demands more explanation, and is likely to involve ‘how’ or ‘why’ questions. These generate ideas about processes, reasons, feelings and motives. ‘Could’ or ‘would’ questions ask the listener to explore their potential to think and reason.

Examples of open questions that invite pupils to think might include:

Why would we want to know that?	What are the alternatives?
Could you tell me more about...?	How can we prioritise?
Is that always so?	What would we like to find out?
Is there another way/ reason/ idea?	Where is there another example of this?
Would you summarise Kelly’s point for us please?	What would we have done had we been there?

Understanding which type of question to ask each pupil is the key to obtaining responses that are successful in supporting learning for that particular individual. **Balancing the use of open and closed questions** makes all the difference to the productive thinking that pupils can do and the opportunities they have to express their understanding and advance their learning. The implication behind a closed question is that there is one preordained ‘correct’ answer. A Suffolk teacher described the function of such questions as establishing “the ‘territory’ of the lesson”, focusing pupils’ attention on “specific details, terms, knowledge”. This is important to do, but are open follow – up questions asked subsequently to explore the pupils’ initial recall.

Teacher and pupil exchange in a science lesson:

Teacher: *How does the guitar make a sound?*

Pupil: You pluck the strings.

Teacher: *How does the sound get to your ear?*

Pupil: Through the air.

Teacher: *What happens to the air?*

Pupil: It sort of moves..... it vibrates.

Teacher: Good word! Can you explain what that means?

Discussion between a group of 13 & 14 year olds and their teacher after shared reading of Kafka's 'Metamorphosis':

Teacher: *What is the point of this story do you think?*

Bindiya: Well, it's a story about a person changing into a bug. Why write a story about that?

Paul: *May be the point of the story is to make us realise what the point of the story is.*

Teacher: OK...

Jelara: *I think the point of the story is to make us think, to get us confused, and to make us to ask questions like 'What's it about?'*

Teacher: Do you think that the point of the story is to confuse and get the reader asking questions?

Sam: *To question, yes... but not just to confuse people.*

Teacher: So what is the difference between being confused and asking a question?

Eva: Being confused is not knowing, but if you're questioning, then you're trying to find out what you don't know.

Open questions that **probe and extend pupils' thinking** and help them **reflect** on their work are essential to the learning process. For instance:

#### When they begin a piece of work :

*How do you think that....?  
How are you going to....?  
Do you think that.....?  
Is it important to .....?*

#### If they have difficulty:

*Could you try to.....?  
What about.....?  
Why not.....?  
Have you compared your ideas with...?  
Would a..... help.....?*

#### Whilst they are working:

*Did you decide to .....?  
Where might .....?  
Have you.....?  
Can you think of.....?  
Can you explain how you...?*

#### At the end of the lesson:

*What / How could you improve..?  
How did that happen.....?  
What did you get out of it .....?  
Why was that.....?  
Which were your best.....?*

(See also 'Use questions to make progressive cognitive demands' page 11??)

In summary:

- **Ask fewer questions** – two or three well thought out questions are worth ten off the top of the head,
- **Ask better questions** – balance the use of open and closed questions.
- **Use questions to probe and extend thinking** – avoid using those that require only a 'yes' or 'no' response.

## Use appropriate language and content

Teacher to a six-year-old drawing a picture of a daffodil: “What is this flower called?”  
Child: “I think it’s called Betty”.

*Quoted by Robert Fisher in his book ‘Teaching Children to Learn’.*

Questions are an amalgam of words and ideas. In order to be able to respond and participate fully in the lesson, the pupils that receive them need to **access the questions**. The reality of most classrooms is that they contain pupils of mixed levels of ability. If a question is framed and then directed to an able pupil, then there is a good chance that less able pupils will have difficulty understanding it.

However one of the most accessible questions that anyone can ask is ‘Why’? The intellectual processes involved in responding to this may be complex or simple – it doesn’t really matter. The question itself is accessible to all.

If questions are to succeed in securing **pupil participation**, to **motivate** them and **generate interest**, then they need to be **constructed to achieve those aims**. It is possible to phrase questions in complicated ways, using words or technical vocabulary which pupils cannot understand. This is frustrating and counter – productive for both pupils and teachers. Similarly, using questions that are too big or abstract to be tackled at once are frequently a waste of time. Beginning a lesson by asking ‘Why are there microbes?’ or ‘Why is there pollution?’ may be met by silence. A more productive approach could be to narrow the focus, create a context and then move from the known to the unknown. ‘Have you ever forgotten about the last slice of cake in the cake tin ...., tomato at the back of the fridge..., found the remains of a packed lunch in your locker after a half term holiday?’

Variants on the questions that are too complex for pupils to fathom are what Alistair Smith (6) calls ‘coded’ and ‘ambiguous’ questions. **Coded questions** are rarely encountered outside the classroom and often contain disguised instructions or warnings: ‘What do we not do when we go to the toilet?’ ‘What do we always remember when heating things over a bunsen burner?’ The answers for the baffled or confused are, apparently, ‘run’ and ‘wear goggles’.

**Ambiguous questions** are subject to a variety of different interpretations: ‘Who has not put their crayons/ apparatus / books away yet?’ Or a sort of vague generalised judgement that is worded along these lines: ‘We’re not paying attention, are we?’, which has the effect of stopping everyone in their tracks and looking around to find out who is the miscreant.

Most teachers are aware of straightforward **classroom language that succeeds** in ‘getting through’ to pupils on a day – to –day basis. Transferring this awareness to questioning is not particularly difficult or onerous. Linking it to a knowledge of the child adds a further refinement that leads to phrasing questions successfully:

‘The ability to pose questions appropriately demonstrates the fundamental necessity for the teacher to know her pupils well. The questions used were in simple language, tailored to each child.’

*Teacher researcher in a school for children with severe learning difficulties.*

Question on observation proforma: *Are the questions appropriately phrased for the class/individuals?*

Response: *Simple / staged / stepped for less able pupils.*

*Observation of a GCSE RE lesson by a teacher researcher in a high school.*

In summary:

**Use language that is clear to pupils** - Ask yourself “Will X understand my question?”. If so they will probably be able to respond to it.

## Distribute questions round the class

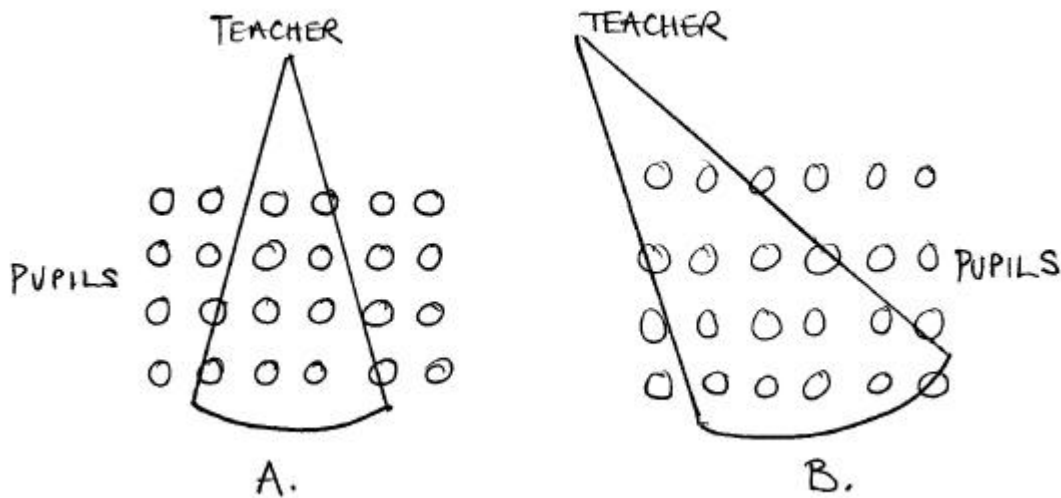
“When one teacher stood at the front of the room, the questions were distributed in a fan shape. When she moved around the room the questions were more evenly distributed.”

*Extract from the outcomes of research into questioning by four middle school teachers.*

Questions have to be **well targeted** to be effective, and everyone in the learning group has to be involved. Pupils interviewed in a Suffolk middle school said that they enjoyed being asked questions, but got fed up, lost interest and put their hands down if they didn't get asked. They also said that it was good when the teacher walked round the room while questioning.

This last comment highlights a simple **classroom management technique** that helps in the distribution of questions around the class. In Fig. 2 are diagrams of a teacher talking to a class whilst standing in two different positions. If she stands as in diagram B, she has a much better view of the group. By moving to a new position relative to the pupil group, the teacher is able to gain a better view of the group. This means that targeting questions to specific pupils is easier, so is watching reactions to questions, and to the answers that other pupils are giving. Control of the group is easier also, should this be necessary.

**Fig. 2**



A forest of eagerly waving hands in reaction to a question may mean that the teacher is spoilt for choice of a respondent. Equally, there may be the temptation to ask the few who are not offering a reply. This could put undue pressure on these pupils, which in turn, may make them even less likely to offer an answer in the future, especially if they feel their reply is inadequate or 'wrong'. At times it may be necessary to draw such pupils in deliberately. At others, watching for eye contact or body language that indicates that there is a response possible and acknowledge this with a nod or a smile.

From their earliest times at school pupils are used to the traditional 'hands up' signal when offering to answer a question. For some pupils it is the 'knee – jerk' reaction to a question, even though they haven't even considered what they might say if selected. **Alternatives to hands up** can provide not only relief for the hand wavers as well as those waved at, but also valuable opportunities to think and consider answers, and share their ideas with others. Learning and understanding developed in these contexts is often deeper and more likely to last.

The following are worth considering:

- ❖ Allowing pupils to talk to one another about a question. *'Ravinder, would you ask someone else what they think /their ideas are?'*
- ❖ Using 'think, pair, share'. *Allowing thinking time, discussing with a partner and then discussing with the group. A 'spokesperson' responds on behalf of the others.*
- ❖ Ask everyone to write down an answer and read out a selected few.
- ❖ Give pupils a choice of possible answers and have a vote on the options.
- ❖ A 'no hands up' lesson/ morning/ afternoon/ day/ week.

In summary:

- **Position yourself carefully when questioning** – how evenly can you distribute your questions from where you are standing?
- **Vary the ways in which you want pupils to respond to your questions** – give everyone a chance to contribute their ideas.

## Thinking time and pauses between questions

“Would it help if I came back to you?” *High school RE teacher.*

“Thinking time was much appreciated. It stopped pupils from blurting out ideas, it helped them to rephrase ideas in their heads and it meant that more pupils could offer an answer.”

*Extract from the outcomes of research into questioning by four middle school teachers.*

Research has shown that the average waiting time for an answer is as little as 0.5 to 1.0 seconds. If an answer is not forthcoming teachers then repeat or rephrase the question, follow up by asking yet another question or divert to another pupil. They want to sustain the pace of the lesson, and this is admirable as long as it does not become a habit that values only the rapid response.

**Pausing to wait for an answer** provides vital time in which thoughts flow and get processed. Studies indicate that increasing this ‘wait time’ (7), to three seconds or more **can result in significant changes for the better**. For example:

- ❖ pupils give extended answers;
- ❖ more pupils are likely to offer an answer;
- ❖ the number of ‘*I don’t know*’ responses decreases
- ❖ the responses that are given are more thoughtful and creative;
- ❖ the number of hypothetical answers increases significantly;
- ❖ the frequency of questions raised by the pupils increases;
- ❖ the frequency of responses from less able pupils increases.

The most able, as well as the less able need thinking time. The most able require time to assemble the mini – essay they have in their heads; the least able need it because it takes them more time to formulate a response. Of course, all the other pupils in the group need thinking time too.

One high school’s research into the role of questioning in maths in KS3 identified how the teachers adopted ‘specific language to encourage the use of thinking time’ such as:

*Think before you answer*

*Don’t call out – put your hand up if you think you know*

*Have a quiet moment thinking*

*Discuss this with your neighbour*

*Don’t say it – write it down*

*Talk about the reason with a friend*

*Let’s come back to that one later*

*Everyone write the answer in the back of their book*

Teachers find it challenging to sustain a longer waiting time, and the ‘spray gun’ approach to questioning resurfaces when teachers find pausing a difficult discipline. Because they are impatient for an answer and keen to proceed to the next question, a high percentage of teachers end up answering their own questions. Questioning then becomes a devalued currency and its potential for improving thinking and learning diminishes.

Allowing more time to answer implies a change in approach. This may include:

- ❖ learning to live with the 'hanging' question;
- ❖ asking learners to elaborate or extend their answers (*'Can you say a little more about that?'*);
- ❖ seeing mistakes as opportunities, (yet moving quickly to correct misconceptions);
- ❖ being aware of how many times individuals answer questions in your lessons;
- ❖ looking out for the 'about to answer' learner and making encouraging noises or body signals.

Thinking time is not confined to the period after the question has been asked. It also is important **after the answer has been given**. This space of time gives an opportunity for reflection, possibly re – thinking and re- stating an idea – a deliberate act by the teacher to encourage a more thoughtful response:

Teacher: So, what do you think makes a piece of music good to listen to?

Pupil A: *When it's played right...no wrong notes.*

Teacher: Hmm (pauses)

Pupil A: *Well, it's probably got a nice tune – you can remember it, or hum it again after it stops*

Teacher: Aah – nice tune, you can recall it. What else?

Pupil B: *It could remind you of something you like doing.... or it's exciting or peaceful and...I mean 'Hall of the Mountain King' was fast and wild sounding, but 'Ase's Song' was sort of sad and much calmer.'*

Robert Fisher (8) suggests that teachers focus on the ways in which they use talking for thinking by asking **three essential questions**:

- Who is doing the talking and the thinking?
- Am I allowing enough thinking time (before and after answers are given)?
- Do I support pupils in their talking and thinking? How?

In summary:

- **All pupils need thinking time** – regardless of ability.
- **Ensure you allow thinking time *before* you expect an answer** – all pupils need at least three to four seconds to process their response.
- **Allow thinking time *after* the answer is given** – so that more thoughtful responses are encouraged.

## Use questions to make progressive cognitive demands

RF: “How do you know that I am Mr Fisher?”

*(Silence)*

**Child (thoughtfully):** “How do you know YOU are Mr Fisher?” *Quoted by Robert Fisher in his book ‘Teaching Children to Learn’.*

In the 1950s Benjamin Bloom (9) published a hierarchy of **six thinking levels** (See Fig. 3). It was an attempt to define and categorise pupils’ thinking skills. According to this taxonomy, **evaluation, synthesis and analysis demand more complex and ‘higher’ levels of thinking** than **application, comprehension and knowledge**, which demand less complex and ‘lower’ levels of thinking. In this context, ‘rewarding’ a pupil who has just got ten sums right with the task of carrying out yet another twenty similar calculations would involve that pupil in low order thinking (practice, reinforcement). However, to ask the pupil to take a learned skill and apply it to a new situation (‘You have found the area of some rectangles; can you use squared paper to discover how to work out the area of this circle?’) would be to require higher order thinking – in this case, application. Similarly, teachers’ questions are capable of bringing about either low or high order thinking in pupils.

**Fig. 3**

Lower order	Higher order
<p><b>1. Recall / Knowledge</b> <i>Asking pupils to remember information they have previously learned, e.g.</i></p> <p>“Who was...?” “What is...?” “Where is...?” “When is ...?” “Can you list three...?” “How would you describe...?”</p>	<p><b>4. Analysis</b> <i>Asking pupils to break down subject matter into its parts, study the nature of its parts and their relationships one with another, e.g.</i></p> <p>“What evidence can you find ...?” “What are the features of...?” “What information will you need...?” “What might this mean?” “What conclusions can you draw?”</p>
<p><b>2. Comprehension</b> <i>Asking pupils to express ideas in their own words or to interpret major elements in texts to make them more accessible, e.g.</i></p> <p>“What do we mean by...?” “Can you explain what is happening?” “Can you think of...?” “What can you say about...?” “Which is the best answer?”</p>	<p><b>5. Synthesis</b> <i>Asking pupils to build a new idea, or theory, plan, experiment or forecast using sophisticated thinking, e.g.</i></p> <p>“Could you design something to...?” “How could we solve...?” “What do think is likely to...?” “How would you test...?” “Suppose you could ...what would you do?”</p>
<p><b>3. Application</b> <i>Asking the pupils to understand a general principle and to apply it in a new situation e.g.,</i></p> <p>“How would you use...?” “What other examples can you find to...?” “What would happen if...?” “What other way would you plan to...?” “What facts would you select to show..?”</p>	<p><b>6. Evaluation</b> <i>Asking pupils to assess or judge, e.g.</i></p> <p>“What do you think about...?” “How effective was that...?” “Can you say which is better and why...?” “How would you prove / disprove...?” “What is your opinion of...?” “Why did they (the character) choose to....?”</p>

It is important to recognise that all classification systems are potentially flawed – and real insight into questioning needs to take into account contextual factors which are too subtle for

such systems to handle. Nevertheless, teachers can use the framework to **structure their approach to questioning** to make increasing cognitive demands. An effective questioning strategy is to move from the 'What' and 'How' descriptive question to 'Why?' and 'What for?'. This way of 'sequencing' of questions offers a **progressive challenge** to pupils' learning. It also provides a model for the sorts of questions that pupils can ask of themselves and each other. There needs to be an appropriate balance between lower and higher order questions with all age groups. As Rosemary Sage (10) states 'Understanding which type of question to ask which student is the key to obtaining successful responses. Use closed questions with students who have limited language and open questions to encourage narrative thinking.'

Applying Bloom's approach to a topic that pupils are studying might result in a framework with questions demanding more and more of pupils' thinking. However, it is essential that teachers know which questioning tactics to use initially with each pupil. Some will be happy to answer a narrowly focused question, such as 'Can you give me a name for the water droplets that fall from the clouds?', but unable to cope with a question requiring an explanatory answer 'Why do we need rainfall?'

## Topic: WEATHER

<b>KNOWLEDGE</b>	<b>Facts to investigate:</b> Definitions of weather, what is weather? Which words would you use to describe the weather: rain, storm, hail, drizzle, wind, gale. Can you find out what certain weather terms mean? e.g. freezing, air pressure, forecast. Can you select equipment and resources to measure and record what the weather is doing, e.g. chart, thermometer, rain gauge.
<b>COMPREHENSION</b>	<b>Questions to consider:</b> Why do we need to know about the weather? How could you find out about the weather? Where can you find a weather forecast? Are the forecasts accurate? Can you say why certain weather conditions occur?
<b>APPLICATION</b>	<b>Problems to be solved:</b> Is today's weather forecast correct? Can you record the weather for a week and make some conclusions about rainfall, sunshine, wind etc.? How can we measure the rain? How can we measure the temperature? Can we compare the weather in different countries? How can we show what we have discovered?
<b>ANALYSIS</b>	<b>Concepts to explore:</b> How does weather affects us? Can we present and comment on some weather statistics and records? Weather sayings 'red sky at night': Can we say if there is any truth in these sayings? Weather and safety: Why are lightning, looking at the sun, icy roads dangerous? How can we explain temperature, air pressure, water cycle in a way that the rest of the class will understand?
<b>SYNTHESIS</b>	<b>Skills to develop:</b> How would you report on a weather disaster e.g. flood, hurricane, tornado. Can you compose a weather poem, create your own book of the weather? How could the TV weather forecasts be improved?
<b>EVALUATION</b>	<b>Learning to review:</b> What have you learnt about the weather? What do people mean by 'bad weather'? What is the weather like in different parts of the world? Can you suggest the best clothing to wear in different climates and say why? What is your opinion of weather sayings? What do you still not understand about the weather / what more would it be interesting or useful to know?

**Recall questions** tend to dominate classroom questioning and make relatively low intellectual demands on pupils. However, it is understandable that a teacher would want to use them to establish some common ground and check on shared knowledge before a lesson moves on. For specific purposes, like mental arithmetic, low – level questions can provide

sufficient cognitive challenge. A balance needs to be struck between the use of 'quick – fix' questions and those that demand more complex, higher order thinking.

**Alternatives** to recall questions help to motivate pupils and create interest. For example:

1. Use a two – three minute, self – marked test.
2. Try using a piece of cloze material.
3. Have the key points from last time displayed on the board / whiteboard / OHP before the lesson starts.
4. Ask a volunteer pupil to revisit the key points of the last lesson for everyone.
5. Review the key points yourself, verbally and rapidly.
6. Use a handout.
7. Use examples 2 or 3, but build in a couple of errors, and ask the class to spot the mistakes.

Jerome Bruner (11) believed that that effective learning took place, not when pupils were given solutions, but when they were presented with authentic problems to solve. He believed the **use of skills from a variety of subject disciplines** to be essential to this approach. Bruner also saw learning supported when learners reflected on their learning – he termed this '**metacognition**'. Much more recently, this has been strongly endorsed by the influential review of research into formative assessment and classroom learning by Paul Black and Dylan Wiliam (12).

Bruner developed these ideas, but they were not new. They stemmed back to the discovery methods in the writings of Piaget and John Dewey. They accord well with the view that questioning is a powerful teaching and learning tool, and suggest that questions that offer challenge and invite problem solving are ways to improve attainment.

In summary:

- **Try to increase the number of questions you use that offer a productive challenge to pupils' learning** – try and build into the plan for each lesson at least three higher order questions.
- **Use recall questions sparingly** – avoid starting every lesson with recall questions, limit the number of recall questions at the start of a lesson to 3 or 4, and keep your own contributions (such as comments on answers) as brief as possible. Develop alternatives.

## Prompt pupils, give cues

Pupil A: "Have I got odd or even?"

Pupil B: "Even I think."

Pupil A: "Is it odd or even Grace?"

Pupil C: "Even... I've got 5."

Pupil A: "Umm...that's odd. What do we do now?"

Pupil B: "Write them...like this..."

Pupil A: "How do you write 12? Have you ever sat on a whoopee cushion?"

Pupil B: " It's a 1 and a 2 I think."

*Exchange between pupils in a Year 1 numeracy lesson focused on understanding odd and even numbers. (Suffolk primary school)*

These children are responding to and prompting each other naturally, and it's a tribute to Pupil B's ability to remain on task that the potential diversion is ignored. Pupils may not always be in a position to seek or find this sort of spontaneous support from their peers. The **verbal encouragement** will need to come from the teacher. Prompting may mean minimal encouragement to keep going or respond – 'Uh huh', 'I see', 'OK', 'And...'. But pupils don't always have a response to give, and even if they do, they may be unwilling to offer it. In such cases prompting may mean taking one or more steps back in the thinking process:

Teacher: *Now imagine your group was shipwrecked on a desert island. David, what could each member of the group offer to do to help the others survive?*

David: (No response)

Teacher: *Well, we've talked about two things above all else that we need to keep alive. Can you remember what they are?*

David: *Er....water and food.*

Teacher: *Yes, good.... so everyone's going to need these things .... Can you tell me what you might see around you?*

David: *Well.... Sand probably, and jungle as well.*

Teacher: *OK. Now how are you going to make sure of water and something to eat..?*

David: *We might find there are fruits.... bananas or something in the jungle.*

Jane: *Some of us could look for water.... a stream.*

Teacher: *Who can take David and Jane's ideas a bit further?*

The teacher, even though she fails to get a response from David, is anxious not to make him think he is a failure. So she **leads him back a few logical steps**, until he can offer a useful comment. Jane's comment is capitalised upon to maintain the group's involvement and move the discussion out to the wider audience.

What Robert Fisher (8) terms '**probing**' requires the teacher to follow the pupil's train of thought and encourage them to explore their thinking more deeply. Probing questions might include:

'Why do you think that...? How do you know...?' 'Can you show me what you mean...?'  
'Can you tell me more about...?' 'Is it possible that...?' 'Can you tell me more about...?'

Cueing and prompting verbally need to be accompanied by congruent **non - verbal reinforcement**. Eye contact, facial expressions such as a smile, and nodding all signal approval and encouragement. Professor Albert Mehrabian (13) pointed out that the words chosen and used constituted only 7% of any communication. The tone of voice counted for 38% and the non - verbal accompaniment 55%. Teachers need to be aware that **what they say and what they do need to be synchronised** if the message they are trying to give is to be understood and believed.

**Processing cues** implicit in the question, also help pupils' prepare their responses:

- Henry, I am going to ask you about what 'eerie' means in a moment or two...
- On Monday we talked about odd and even numbers. I'd like each one of you to think of three odd numbers and three even ones...
- I want each group to consider the sites for the new supermarket and try agree amongst you which one is the most suitable. At half past, I'd like to hear your choices and three reasons why.
- Caroline, if you were to teach this to your younger brother how would you.....?

Within each question or request is an implicit cue that allows for the response to be delayed. A **longer processing time** is created, and sometimes a parameter in which to shape the reply. (See also *Alternatives to hands up* in the section 'Distribute questions around the class', page 8)

However, as many teachers will recognise, getting any response at all can be difficult. So, what can you do? If responses are not forthcoming, or even if they are, and a different approach would be welcome, varying the following tactics may be helpful:

- ❖ Tell the group that you are going to ask them a question, and that you will supply two answers, 'a' and 'b'. If they think 'a' is a good answer, they should raise their hand with the thumb pointing upwards. If they prefer answer 'b', they should raise their hand with the thumb pointing down. If they don't know, they should keep their hand down, but they may be asked why they are not prepared to commit to one or other of the answers.
- ❖ Issue everyone in the group with red, yellow and green cards. When you pose a question, ask them to show a green card if they know the answer, a red card if they don't and a yellow if they are unsure. This gives very visual feedback on the effectiveness of the teaching.

- ❖ Ask a question and allow pupils to write down an answer. Allow them to share and compare what they have written with a partner. Finally, nominate an individual / individuals to answer.
  
- ❖ Ask questions with a class list / mark book in front of you. Tick the names of the individuals that answer. Never nominate the same individual until everyone in the group has supplied a response of some kind over a specified period or set of lessons.
  
- ❖ Nominate a 'response group' whose job it is to monitor the lesson and ask questions on behalf of the class. In the last 5 – 10 minutes, they should summarise the main learning points and ask appropriate questions. Set a target for the number of questions (maybe a minimum of 5). You might even separate them from the rest of the group to emphasise their role. The membership of the response group needs to be rotated around the class until everyone has had a turn over a series of lessons.
  
- ❖ Nominate an individual to answer a question before it is asked. Make sure that the question is easy, but do not fall into the trap of saying something like *'This is an easy one, even you could answer it...'* and remember that as soon as you identify one person to answer, everyone else knows that they can 'hitch – hike'.

In summary:

- **Utilise prompts that help pupils form a response** – these can range from the minimal 'Aha' to a question with a cue implicit in it.
  
- **Link verbal prompts to appropriate non - verbal prompts** – over half of what you are trying to communicate will rest with body language such as a smile, a nod or accepting gesture.

## Use pupils' responses, even incorrect ones

**“Incorrect answers presented a much more interesting opportunity.**

**We didn't just say 'No, wrong'. Common checking questions that we used were: 'How did you do that?' 'Who agrees with this answer?' 'Anyone get a different answer?' 'What should the answer be, do you think?'**

*Extract from the findings of a high school's action research into the role of questioning in KS3 maths.*

The survey of classroom assessment in Suffolk (1) found that some teachers were uncertain as to how to use pupils' responses if these lacked understanding or were inaccurate. One of the most frequent ways in which teachers deal with wrong answers is to gloss over them. Kerry (14) describes it as being 'damned with faint praise':

Teacher: How many sides has a hexagon Manveer?

Manveer: *Five, Miss.*

Teacher: Well, you're not too far out...Can anyone...?

There are also classrooms where pupils are seldom encouraged to enter into a dialogue with the teacher. When pupils do speak, they are expected to be brief, and they recognise that their responses will fall into one of two categories – correct or incorrect:

Teacher: What is this?

Pupil A: *It's an owl's foot.*

Teacher: Correct. Anyone tell me what they notice about it?

Pupil B: *It's covered in hair.*

Teacher: Exactly. Now why would an owl's foot be covered in hair?

Pupil C: *To keep it warm.*

Teacher: No. Who has another idea?

The art of dealing with such a response is to be able **to say that the respondent is wrong, but point her or him towards a better answer** at the same time. Approaches in the 'Prompt pupils and give cues' section on page 16 may also be helpful.

The term '**recast**' is used to describe a variation of this technique:

“ If a response was incorrect 'No' was not used. With the nursery children the emphasis was very much on the repetition of the language and the name of the objects – encouraging the children to recognise and link the object with its name. With older children answers were recast to provide the correct version rather than to give a negative response to a child.”

*Teacher commenting on her classroom observations in a school for children with severe learning difficulties.*

In classrooms where contributions about learning are encouraged, exchanges between pupils may be as helpful as teacher intervention in advancing thinking and understanding:

Teacher: Can anyone tell me, is this apple dead or alive?

Gemma: *It's dead.*

Teacher: Why do you think it's dead?

James: *It's been picked off the tree, and when it was there, it was part of the living tree. It's not now, so it's dead.*

Teacher: Who agrees with James? Is there anyone who disagrees?

Sara: *I don't agree with him.*

Teacher: Can you tell us why Sara?

Sara: *Well, we don't **know** that the apple is dead – a bit of it could still be alive.*

Melanie: *I think that's possible because there are pips inside, and if you put them in the ground they'd grow.*

James: *They wouldn't you know Melanie, they wouldn't grow – not if the apple's dead.*

Tom: *I planted some pips once and they started to grow – so they weren't dead.*

Phillippa: *Because it's got pips it doesn't mean that it's still alive. Leave it alone and it'll shrivel up, just like dead person.*

Simon: *I agree with Tom. If part of something is still alive, it's still alive ...like the pips.*

Sara: *I think that part of it is still alive, and part is dead, because it's been broken off the tree.*

Teacher: So what does being alive or dead mean?

Rebecca: *To be alive you have to be part of something living, like an apple on a tree....*

In summary:

- **Try to use pupils' incorrect responses to advantage** – aim to point out the error, but focus on a better answer at the same time.

## Encourage pupils to ask questions

Where do they live?

How do they use their trunks?

What do they eat?

How do they walk on hot sand?

*Questions thought up by pupils in a Suffolk reception class in response to being asked 'Think about things you would like to find out about elephants.'*

The fact of teaching is not a guarantee of learning, and the involvement of pupils in their own learning is vital for its success. Pupils' questions are one way in which that involvement, as well as interest and motivation, can be achieved.

As Fler and Hardy (15) point out when writing about science education, "Allowing children to have significant control over the learning process is critical. Asking, and being encouraged to investigate their own questions is one aspect of that."

This view has been strongly reinforced by the action research on questioning carried out by Suffolk teachers. The teachers concluded from their observations that where children were developing their questioning skills, they were also:

- Developing independence, relying less on the teacher and asking one another more.
- Taking responsibility for their learning rather than being directed.
- Working through difficulties rather than automatically asking for help.
- Able to explain and express themselves more easily.
- Thinking about what they were trying to achieve by asking questions.
- Seeking explanations and alternatives more frequently.
- Starting to manipulate their learning.
- Reflecting on / evaluating their own understanding and often taking it further.

In all but a very few observations during this research, **the balance of questioning was with the teacher**. Teachers asked 50 – 70 % more questions than the children did. Ted Wragg's Leverhulme Project (16) identified the same issue: in 20 lessons observed only 20 questions were asked by the pupils themselves.

One of the reasons why there are fewer pupil questions could be that teachers do not plan in enough time for them, so they are not encouraged. In all key stages there is pressure to 'cover the ground', but if being able to frame and ask questions is such a valuable learning device, then **time for pupil questions** and for dealing with them effectively has to be a serious consideration.

Whether or not pupils are willing to ask questions, depends on the relationship that a teacher establishes between herself and the class. Remarks such as 'What a stupid question..!', 'There's no time to deal with that now..', 'If I've told you once, I've told you a dozen times..just get on with it!' sometimes are legitimate. But all too often they are 'put – downs' that **suppress contribution** rather than welcome it.

Encouraging questions can be achieved by making them welcome and valuing them by **listening to them carefully**. Teachers are usually much better talkers than they are listeners – ask anyone whose best friend, mother, father or partner is a teacher. The skill of listening is a composite one and encompasses not only paying attention and taking in the words that are said, but also:

- Picking up clues about any hidden motive in the asking, e.g. insecurity about an idea, fact or technical language;
- Being sensitive to the pupil's own opinions or concerns, e.g. pupils may have personal worries over issues like race, bullying, health;
- Listening out for misunderstandings.

In signalling interest in pupils' questions, **body language and tone of voice play an important role**. Boredom, frustration, irritation etc., are so easily conveyed by how the response is spoken and any actions that accompany it. Raised eyebrows, sighing, stifling a yawn, glancing at the clock, giving out books whilst answering can all 'put the brakes on' future exchanges.

Developing good listening skills also requires the teacher to think carefully about **how they will respond** to the question. There is a tendency to assume that the best way to deal with a pupil's question is to give a brilliant, knowledgeable answer. In reality, it may be far more appropriate to use a series of teacher questions to help the pupil set up an analytical process in order for them to find their own answer.

A strategy that is central to the development of pupils' questioning skills is **modelling**. Here the teacher provides and encourages the pupils to use appropriate vocabulary and gives examples as a stimulus for the children's own questions. Teachers who model their thinking encourage similar behaviour in their pupils. If they speculate, suggest, hypothesise and offer their own thoughts and ideas by **thinking aloud**, then there is every possibility that pupils will develop an understanding of what a question is, what it can do for you, and also how to structure questions. We cannot assume that any child automatically knows or understands how to do these things.

A Suffolk reception class teacher told her class that she couldn't find a book about elephants and they needed one for literacy time. By using two 'think alouds' she began the discussion:

'What could I do?' 'How can you help me?'

This led to the pupils deciding that they could make their own book. The teacher then asked them to think about things that they would like to find out about elephants. Some of the questions that were generated in this session are printed at the beginning of this section. Others included:

'How big are elephants?' 'How big is a baby one?' 'What colour are they?' 'Have they got big ears?' 'Can we take the book home?'

'Think alouds' might include:

*What am I going to do /write/ say now? Why have I stopped...?*

*Who can help me? What do I need? What is the next step?*

*What is my problem? What sort of problem is this? Where have I seen this before?*

*How am I doing? How will I do it? How have I done?*

*What am I doing now? What do I need to do? What can I try?*

*Is there a better way? What alternatives are there? What must I remember?*

Finding books, objects and materials that stimulate curiosity can help to stimulate pupils' questions. When shared with pupils, the teacher's own curiosity, doubts and things s/he doesn't know may have a similar effect.

If pupils are to be active questioners they need to practise the skills involved. This means **providing opportunities for creating questions** in a variety of ways and using a range of stimuli and sources.

If pupils themselves identify what they want to know by asking a question, then they are much more likely to value and remember the answer. When teachers share learning intentions or criteria to be met with pupils, this helps them **identify what is significant in their learning**. Groups can then devise questions for their study, writing or textbook, to test themselves or others.

It helps if there is a **clear purpose** for the questions pupils generate, either as group or as individuals. For example, to think of questions to include in a wall display, to prepare questions to ask a visitor to the class/ school, to send away their questions to an author, to find out how to do, write or make something, to help solve a problem, to find alternatives/ better ways to do things, to determine what it is they want to learn/find out about, etc.

Teachers can discuss the **nature of questions** with pupils. Giving a list of questions to think about critically will help them to discriminate and decide which are the good and not so good ones, and which are the best or most interesting.

**Displaying questions** around the room so that they can be read easily is helpful. They can be referred to at any time, added to and / or adjusted, removed and replaced if needs be:

Questions are <i>COOL</i> ~
What?
Where?
When?
Why?
How?
Who?

Productive, open – ended questions can be included in classroom displays for pupils to read, reflect on and explore further. A ‘problem corner’ could be established where a question of the day/ the week is on offer, together with books and materials to stimulate thought and action. The pupils can be invited to add their own questions.

**Playing games** and using activities in which questions are an essential feature help to develop the necessary skills e.g. What am I? What number/ object am I thinking of? Making a quiz, 20 Questions, hot – seating, role – play, preparing to interview someone.

A simple way to assess the ability of pupils to devise questions is to give them a common object, e.g. shoe, chair, cheese grater, and ask them to list as many questions about it as they can. Another way is to take a subject of current study and see how many questions pupils can create about the topic. A third way is to choose a text, possibly part of a story or poem, and see how good they are at interrogating the text by asking them to create questions about it.

In summary:

- **Plan time for pupils’ questions into lessons** – and for dealing with them effectively.
- **Model questioning for pupils** – so that they have examples of how to develop the skills of questioning for themselves.
- **Provide opportunities for pupils to create questions** – use a variety of ways and a range of stimuli and resources.

## Listen and acknowledge pupils' responses positively

**“Students will not open up and engage in classroom dialogue unless their thoughts are valued and of interest.”**

*Professor Trevor Kerry in his book 'Questioning and Explaining in Classrooms.'*

Teachers who willingly converse with pupils about everything and anything, have already laid the foundations for learning through questioning. They have established a pattern of informal social interaction that will help pupils to trust and talk freely with them in the classroom.

Giving value to every response that pupils offer during questioning can become a recipe for disaster unless **roles and ground rules** are established and understood. Questioning, if it is to be effective, **shifts the emphasis** in learning from the teacher to the pupil. The teacher enquires, probes and challenges. The pupils need to understand that they are expected to be actively involved (through thinking and speculating), and to make positive contributions. The contributions have to be disciplined, so a teacher will need to work on getting some **parameters** in place, perhaps by discussing or generating them with the pupils. They are far more likely to use and enforce these, one with another, if they consider they drew them up in the first place and thus 'own' them. For example:

- Stop and think before you answer,
- Hold back – don't rush in with the first unconsidered thought in your head,
- Listen to the contributions of others – don't interrupt,
- Learn to accept alternative points of view, options or solutions.

These are skills that have to be taught, learned and practised if learning is to take place largely through questions. Pupils have to be discouraged from making distracting or irrelevant remarks – responses have to be focused on the matter in hand. This does not preclude humour, as long as it is directed to the learning issue. Irrelevance simply sabotages the learning process.

Some strategies for teachers to help ensure a positive response to pupils' questions:

- **Model fairness, consistency and a problem solving approach** in your responses.
- **Separate the person from the response.** Avoid assigning any negative label to the pupil as a result of response they have given.
- **Provide safe feedback strategies.** Make it safe to say 'I don't know' or 'I don't understand.' Younger pupils respond well to traffic lights or scoring. Green or five means 'I know' or 'I can give an answer', amber means 'I'm uncertain' and red or zero means 'I don't know / understand – yet' or 'I need help'.
- **Teach and use active listening skills.** Circle time (for younger pupils) and role play (all age groups) are good mechanisms for pupils to experience and learn turn taking, attentive listening, giving and receiving feedback and asking clarifying and reflective questions.

In summary:

- **Talking to pupils outside as well as inside the classroom** will help to establish rapport and trust that lays the foundations of questioning as a learning technique.
- **Establish ground rules with pupils** that will help them all be comfortable with questioning.

## ***'How do they walk on hot sand?'***

### *Ways of using questions to help children learn*

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#### **Useful websites:**

<b>Association of Advisers and Inspectors of Assessment</b> (this site has useful links)	<b><a href="http://www.aaia.org.uk">www.aaia.org.uk</a></b>
<b>Suffolk Learning and Management Network</b>	<b><a href="http://www.slamnet.org.uk">www.slamnet.org.uk</a></b>
<b>Professor Robert Fisher's website</b>	<b><a href="http://www.teachthinking.net">www.teachthinking.net</a></b>
<b>FNO (Jamie McKenzie, American educator)</b>	<b><a href="http://www.fno.org/oct97/question.html">www.fno.org/oct97/question.html</a></b>



## Ideas for enhancing the quality of questioning

- Do you use the 'individual, work as a pair, share as a group, present to the class' method to its best effect?
- Do you provide pupils with the sort of questions *they* might want to ask?
- Do your questions motivate?
- Can you preface your questions with an individual's name and a motivational challenge? *'Gemma, I know that you can give me three examples...'*
- Can you do this in ways that make it safe to get it wrong?
- Do you ask pupils to explain their thinking?
- What do you do when you ask the question *'What makes you think that Rapesh?'* and get the answer *'Dunno, miss'*? Do you provide other, extending questions: *'What other alternatives did you consider? 'Why did you reject them?' 'What makes this choice the best?'*
- Do you reflect back? *'So, if I'm right what you're saying is....'*
- Do you ask pupils to listen accurately? Summarise? Speculate?
- Do you play devil's advocate?
- Can you encourage upside - down thinking by asking for the opposite point of view, or an outrageous alternative?
- Do you encourage thinking about thinking through your use of questions?
- Do you provide opportunities for pupils to explain the processes they chose, as well as describe the outcome?

## The Dos and Don'ts of questioning

<b><i>Dos ~ Effective questions are those that:</i></b>	<b><i>Don'ts ~ common errors that everyone makes at times:</i></b>
extend and raise the discussion to a higher level of thinking	using questions that pupils cannot understand and respond to
start with a narrow focus and broaden out ~ recall first, then encourage fresh thinking	asking a question and answering it yourself before the pupil has a chance to think
start with a broad focus and narrow down to detail	asking too many questions
take a circular route ~ a series of questions leading back to the original idea	asking questions of only the brightest and keenest pupils
take a straight route using questions of a similar type	continually asking the same type of question
provide a 'skeleton' on which to hang ideas	asking questions in a way that pupils find intimidating
signal that participation is valued	failing to acknowledge pupils' responses positively and putting them down
help pupils externalise their knowledge and put it into words	failing to deal with an answer sensitively
stimulate and sustain continuing interest in a topic	failing to build on and extend answers

## APPENDIX 3

### PLANNING QUESTIONS ~ A SUGGESTED FRAMEWORK

**RECALL** *recalling, revising material that has already been covered – facts, terms, basic concepts. **Question cues:** who, what, why, when, where, find, spell, match, name, tell, show.*

**COMPREHENSION** *understanding the main points of the story by giving descriptions, stating major ideas. **Question cues:** describe, explain, predict, interpret, outline, summarize.*

**APPLICATION** *transferring knowledge learned in one context to another. **Question cues:** complete, illustrate, plan, make use of, choose, experiment with, change.*

**ANALYSIS** *analysing mood, setting, characters, expressing opinions and preferences, make inference & deduction. **Question cues:** compare, connect, arrange, select, discover, simplify.*

**SYNTHESIS** *developing a critical stance based on information from a range of sources. **Question cues:** compile, propose, imagine, improve, develop, create, generalise, rewrite, improve.*

**EVALUATION** *making judgements and explaining the reasons for them, developing reasoning using evidence. **Question cues:** conclude, prove, disprove, criticise, convince, recommend.*

## Research into questioning

*With your experience and knowledge of classroom practice, what would be your 'best guess' answers to the following questions:*

1. What percentage of teachers' questions is concerned with recalling facts?
2. What percentage of teachers' questions is concerned with managing the class?
3. What percentage of questions do you think demand higher cognitive demands of pupils? (Blooms' categories 3 - 6)
4. Who do you think asks the greatest proportion of higher order questions - primary or secondary teachers?
5. How many questions does the 'average' teacher ask in their working lifetime (40 years)?
6. Who asks the greatest number of questions per lesson on average - maths or modern language teachers?
7. Is higher order questioning a factor in test/ exam success?
8. Do teachers question in the same way lesson after lesson?
9. What do an individual teacher's questions reveal about them?
10. Has the National Curriculum had an effect on the kinds of questions teachers ask?

## Research into questioning

### 1. What percentage of teachers' questions is concerned with recalling facts?

The highest scoring category of classroom question is *recall* – a low order operation – 60% upwards. Leeds Project (primary) (16) showed that most questions teachers use are closed and factual with known right answers. Children not encouraged to persist in their thinking & learning. Findings reflected in research by action research into questioning in Suffolk primary, middle & high schools.

### 2. What percentage of teachers' questions is concerned with managing the class?

Management and pseudo – questions (“Will you sit down please?”) 12 –30%.

### 3. What percentage of questions do you think demand higher cognitive demands of pupils? (Blooms' categories 3 – 6)

Kerry's research (14) in KS3 only 3.6% fell into the higher order category, but Ted Wragg (16) found that in the primary schools he researched it was up to 10%.

### 4. Who do you think asks the greatest proportion of higher order questions – primary or secondary teachers?

Kerry (14) found that in KS4 exam groups higher order questioning percentages could drop, but some primary teachers reached levels of 44% higher order questions of all those asked.

### 5. How many questions does the 'average' teacher ask in their working lifetime (40 years)?

The number of questions teachers ask is huge and so, therefore, the professional effort and significance that this skill assumes. Since most teachers ask 43.6% question per teaching hour, in a teaching career they are likely to ask between 1 and 2 million questions. Getting questioning skills honed seems an effective thing to do!

### 6. Who asks the greatest number of questions per lesson on average – maths or modern language teachers?

In secondary schools maths teachers attain the 43 + questions per hour rate, modern linguists 76 (3 – 3.5 million in a teaching lifetime).

### 7. Is higher order questioning a factor in test/ exam success?

Value of higher order questions may be less to do with exam success & more to do with developing pupils' cognitive and critical faculties – researchers suggest that higher order questions do not appear to have a measurable effect on the ability to do well in tests and exams. Maybe because such assessments depend on memory and repetitive skills. However research has shown that the **more children are questioned the less initiative** they show in their answers.

### **8. Do teachers question in the same way lesson after lesson?**

Evidence suggests that teachers use the same repertoire of questioning skills and the same patterns of questioning lesson after lesson. The no. & type of questions used by an individual tends to remain constant lesson after lesson – like driving a car – habits picked up early in experience tend to become permanent (backed up by observations in Suffolk research)

### **9. What do an individual teacher's questions reveal about them?**

Teachers questions could be seen to signal an individual's view of education – questions tend to reveal what kind of thinking that person wants from pupils – enquiry, speculation, regurgitation, conformity etc.

### **10. Has the National Curriculum had an effect on the kinds of questions teachers ask?**

Much of the published research on questioning predates NC, but the Suffolk research and that of Kerry (14) tends to confirm that little has changed, particularly in secondary schools. However, there is anecdotal evidence that the literacy and numeracy strategies may be having a beneficial effect.

**Proforma for Observing Questioning Skills**

<b>Teacher:</b>	<b>Observer:</b>	<b>Date:</b>
<b>Class:</b>	<b>Duration of observation:</b>	
<b>Lesson / topic/ theme</b>		

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**Evidence of preparation of key questions:**

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**Use of appropriate language / content:**

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**Distribution of questions:**

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**Use of pupils' responses:**

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**Timing / pausing**

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**Prompting / giving clues**

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**Making progressive cognitive demands:**

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**Encouraging student questioning:**

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**Avoiding pitfalls (poor voice control, mannerisms, rushing)**

## REFLECTING ON YOUR QUESTIONING

### Reflect upon your own lessons:

- Why do you ask questions?
- How do the questions you ask help pupils learn?

### Be observed while you are teaching:

- Every time you answer a question, the observer should write down O (open) or C (closed).
- Alternatively, the observer could give each question a score of 0 – 5 depending upon how it contributes to learning.

### Analyse the results:

- What percentage of the questions that you asked were open (scored 3 –5)?
- What percentage of your questions were closed (scored 0-2)?
- When do you tend to ask the open questions ~ at the start of the lesson or in the middle?

***How teachers encourage pupils to ask their own questions***

School:	No. of children:
Year Group(s):	No. of support staff:
Subject:	Duration of observation:

Description of lesson:
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**Tally of questions asked (optional):**

By children, learning focused	By teacher
By children, not learning focused, e.g. re procedure, administration etc.	

Please cite briefly any actual examples that serve to clarify / illuminate your comments.

**In what ways does the teacher encourage pupils to ask /devise questions?(oral and written)**

*e.g. offers tasks that need questions to be devised, builds investigation rather than explanation into lesson etc.*

**What sort of questions are pupils asking / devising?** *e.g. exploring alternatives, seeking explanations, clarifying meaning etc.*

**How are children’s questions being used?**

**What impact is children’s own questioning having on their learning?**