

Using Questioning in Mathematics



FOSSE MEAD
PRIMARY ACADEMY

Within mathematics, questioning is key to develop a pupil's full understanding of a given concept. This process of questioning should move through several stages in order to ensure a pupil has mastered the ideas. Good questioning in turn will lead to a pupil having to think deeper and develop their own skills of reasoning.

Questions fall into four main categories:

1 - Starter questions

These questions are posed with a given start point for the pupil to begin from in order to think into an idea. They must be open ended but designed to lead the children's thinking in a general direction.

2 - Mathematical thinking

These questions should help children to see patterns and relationships between different areas of mathematics. These are particularly effective when a child is 'stuck'. In order to best design this type of question, teachers can take what would often be instructions of what to do next and rephrase them as questions.

3 - Assessment questions

These questions are used to get children to explain what they are doing. This links very closely to developing a pupil's ability to reason and requires the children to have had time to work through a problem and explore lots of different solutions first.

4 - Discussion questions

Questions here allow pupils to share their different solutions and discuss what they have done to reach an answer. This is a really important step which allows children to think about the answer they have reached and evaluate what they did to get there.

Alongside these ways of thinking about our questions, we must consider Bloom's Taxonomy and how it connects to mathematics teaching.

LEVELS OF THINKING	GUIDE QUESTIONS
<i>Remember:</i> recalls or memorises information	What have we been working on that might help with this problem?
<i>Understand:</i> changes information into another form discovers relationships	How could you write/draw what you are doing? Is there a way to record what you've found that might help us see more patterns? What's the same? What's different? Can you group these in some way? Can you see a pattern?
<i>Application:</i> solves a problem - use of appropriate generalisations and skills	How can this pattern help you find an answer? What do think comes next? Why?
<i>Analysis:</i> solves a problem - conscious knowledge of the thinking	What have you discovered? How did you find that out? Why do you think that? What made you decide to do it that way?
<i>Analyse:</i> solves a problem that requires original, creative thinking drawing together different concepts.	Who has a different solution? Are everybody's results the same? Why/why not? What would happen if ...?
<i>Evaluation:</i> makes a value judgement	Have we found all the possibilities? How do we know? Have you thought of another way this could be done? Do you think we have found the best solution?
<i>Create:</i> the children are able to use their learning to create their own mathematical problem.	Can you create your own question?

Our overall aim as a school is to use our questioning in an effective way in order to allow our children to become confident mathematicians by self-questioning.