

## Great Questions

“Good questions don’t replace careful listening .... Circulating as students work in pairs or groups, teachers often arrive in the middle of an activity. Too often they immediately ask children to explain what they are doing. Doing so may not only be distractive but may also cause teachers to miss wonderful moments for assessment. Listening carefully first is usually more helpful, both to find out how students are thinking and to observe how they are interacting” (*Storeygard, Hamm & Fosnot, 2010*)

***Provide wait time*** – allow for students to formulate their thoughts to words

**Questions that are useful for prompting students *to explain how they got their answer.***

- Tell me how you figured it out?
- What have you discovered?
- What steps did you do?
- What did you do to get your answer?
- What did you do first?
- What were you thinking?
- What number did you start with/ do first?
- How did you get that?
- How did you get your answer?
- How would you explain this?
- How did you establish your answer?
- How do you know that that’s right?
- How did you work that out?
- How did you do it?
- Is there another way you could have done it?
- Can you show me what you did and tell me about it
- Can you explain what you did?
- Can you tell me how you worked it out?
- Can you show me?
- Why did you...?
- Does anyone have the same answer but worked it out a different way?
- Did you start at an explicit number?
- Teach that...to your partner!
- Where did you start?



Questions that are useful for encouraging students *to justify their answer.*

- How do you know?
- How else could you have...?
- How did you check your answer to see if it was correct?
- How would you prove that?
- Why did you...?
- Why did you start with... instead of...?
- Why is that true?
- Why is that true?
- Why did you ...add?
- Can you think of a counter example?
- Can you show me what you did?
- Can you think of another way to do it?
- Tell me about it?
- What did you do to get that answer?
- What clues helped you?
- What facts did you use?
- What do you know is useful to solve problems?
- What else would you like to tell us?
- What made you decide to do it that way?
- Is this true for all cases?
- Would you like to come out and show us what you did?
- How do you know that's the answer?
- How would you prove that?
- Prove that there is only one possible answer.
- Show me what is the same/ different?
- How did you check your answer to be sure that \_\_\_?

**Questions that are useful for encouraging students *to predict*.**

- What would happen... if?
- What would you do if...? (I swapped 4 for 5)
- What will you do next?
- What could you do next?
- What could you do to prevent that?
- What do you think it could be?
- What will happen if you...?
- What did you notice when...?
- What would the next number be?
- What decisions could you make from the patterns you have discovered?
- What can you do to solve this quickly?
- What do we need to do first?
- What would happen if and if not?
- Do you think this would work with other numbers?
- Do you...?
- Is it a small, large number?
- Is your number/ answer going to be...?
- Is there an exception?
- How is the pattern like addition?
- How are adding and multiplying the same?
- How could we find out?
- How else might you have solved this problem?
- Can you see a pattern?
- Can anyone guess how I might work this out?
- Does your answer seem reasonable?
- Would it be the same if we used different...?
- Will it be the same if we use different numbers?
- If I do this... what would happen?



Questions that are useful for supporting students *to make connections or transfer their knowledge.*

- What else could you have done?
- What does make you think of?
- What does this make you think of?
- What other maths can you connect with this?
- What do you know about these numbers?
- What areas or operations did you use?
- What if you had started with...?
- What did you see in the newspaper/ TV that was related to maths?
- How do you relate to...?
- How many ways can you find?
- How are these different?
- How does knowing  $x$  help you answer  $y$ ?
- How is this like...?
- How does this relate to...?
- Is there another way?
- Is this the most efficient way?
- Is there any other way to do that?
- Can you give me an example of...?
- Can you give me an example?
- Can you group these?
- Can you show us or demonstrate how this is...works?
- Can you see a pattern?
- Can you give me an example of...?
- When do you use this maths at home/ school...?
- Where do you see...?
- Where could you use this to solve a problem?
- If we know this...will it be the same this way?
- Who has the same answer? (who agrees?)
- Have we all found the possibilities?
- Why did you choose that method, strategy etc.?
- How can you use this to answer that question?

### Additional ideas

- How could you record your work?
- How many ways can you do...?
- How could you record your findings?
- How useful is your strategy in designing a problem to share?
- How would you rank your strategies?
- What information do you have?
- What strategies are you going to use?
- What facts do you have?
- What do you know that is not stated in the problem?
- What do you do/ can you do when you get stuck?
- What if you could only use...?
- What have you discovered?
- What do you think is the most effective?
- Hypothesise – open ended!
- Is there another way?
- Convince me!
- Can there be another answer?
- Does anyone have another way of doing it?
- Does anyone have the same answer, but a different way to explain it?
- Promote problem solving
- Examine effectiveness of strategies
- Get students to write a problem/ question in a sentence
- Design ICT activity to promote multiple strategies.

### Incorporate verbs that elicit Higher Levels of Bloom's Taxonomy

Connect, elaborate, evaluate, justify ... observe, notice, remember, interpret, summarize, visualise (see), differ, distinguish, decide, identify, compare, predict, explain, conclude, relate, consider, describe ...

*“Questioning is a powerful instructional strategy. **Open questions** that are related to the big ideas embedded in the curriculum expectations and learning goals will excite student curiosity, provoke critical thinking, elicit reflection and help students construct their own meaning for the mathematics they are studying. **Their responses will help the teacher assess what students know and what next instructional steps might be. Developing skills in questioning for understanding and content knowledge evolves over time and needs practice. The payoff is significant in terms of students’ conceptual understanding.**”*