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| **REASONING** | **PROBLEM SOLVING** | **UNDERSTANDING** | **FLUENCY** |
| What are the types of questions that could help elicit reasoning in your students? | What are the types of questions that could help elicit problem solving in your students? | What are the types of questions that could help elicit understanding in your students? | What types of questions that could help elicit fluency in your students? |
| Justify your answer.  Prove why this cannot be the answer.  Convince your teacher your answer is correct.  Can you generalize your answer?  What happens in general?  Can you prove this is a special case?  Is it always, sometimes, never…?  What can you infer from your answer / solution?  If you have changed your mind can you explain why you have?  Why?  How would it be different if?  What are the reasons for?  What would happen if ….you added / deleted / modified …?  Who benefits from…… and why do they?  What are the strengths and weaknesses of …?  Why is it necessary to…?  Prove why …….is necessary to..?  What would……think and why?  What could happen next and why?  What evidence is there to support your answer?  How can you be sure of what you are saying?  What has to change and what has to stay the same so that ……is still true?  How can we be sure that…..?  Is it ever false that ….?  Is it always true that….?  Explain the role / use of….  What if you try a bigger / harder /simpler / smaller / more complex example?  If I had a student who…? Could their solution be true?  Somebody else told me….. What were they thinking? | Can you solve the problem in three (or more) ways?  If this is the answer, what is the question?  What assumptions have been made? Why did you make those assumptions?  Is there an alternative way to answer?  What can be added / removed / altered without affecting….?  What must be added / removed / altered in order to allow / ensure / contradict….?  **6 S’s**  **Search** – what are you being asked to find out? Underline what you think are the key words in the information you have been given. Are there other questions you need to ask?  **Sort** – what information is helpful? What information is irrelevant? What additional information would be useful to solve the problem? Can you represent the information using numbers / mathematical symbols?  **See** – do you need to draw the problem? If there is a diagram already, can you add extra information?  **Select** – Select the operation / information you will use to solve the problem. What might be a way to start? Is this the only way?  **Solve** – Before you start, can you estimate what your answer should be? Can you model your solution on a simpler example?  **Sense** – Does your answer make sense? Can you justify your answer?  Is your solution the most *elegant* or *efficient* or *convincing* way to solve the problem?  Which one feels like the best solution? | What do you see?  What is not the answer?  Where have seen information like this before?  How does….relate to what we have been talking about before?    What do you think about that?  What does it make you wonder?  How are these …………. the same or different?  What do you notice?  Is there a connection between…?  Is there more than one to…?  What if…(change some parameter)…is it still?  Is this always going to be same?  What is missing?  Can you re-describe the problem in another way?  How could you re-state this problem to someone you knew nothing about….?  Suppose that…?  What if…?  What if we knew…?  What is the purpose of…?  What would change if….?  Sort or organize the following according to……  Is it or is it not…..?  Do you think it will always happen?  Tell me what your current thinking / idea is.  What is the connection between? | What do you think you know about this topic?  What questions do you have?  What do you think it is like?  What is the nature of…?  Can you give me an example?  What does the topic make you want to explore?  What would be the most efficient way to begin to solve / answer….?  What is the quickest / easiest way to…?  What is facts do you need to know?  Can you remember away to….?  What is the definition of….?  Can you rephrase that?  How could you record ….?  Calculate..  Do you need to re-arrange / substitute / plot / recall?  What is the difference between … and …?  Describe the features of….?  Tell me something that must be true if….  Show me an example of…..  To be a ….which aspects must be added?  Complete, and delete or correct properties as required so that…..is true. |