

## Developing Mathematical Thinking with Effective Questions

	Often	Some- times	Rarely	Not yet
To promote problem solving, ask...				
• What information do you have? What do you need to find out?				
• What strategies are you going to use?				
• Will you do it mentally? With pencil and paper? Using a number line?				
• What tools will you need? Will a calculator help?				
• What do you think the answer or result will be?				
To promote problem solving, ask...				
• How would you describe the problem in your own words?				
• What facts do you have?				
• What do you know that is not stated in the problem?				
• How did you tackle similar problems?				
• Could you try it with simpler numbers? Fewer numbers? Using a number line? What about putting things in order?				
• Would it help to create a diagram? Make a table? Draw a picture?				
• Can you guess and check?				
• If you compared your work with anyone else's, what did they try?				
To make connections among ideas and applications, ask...				
• How does this relate to...?				
• What ideas that we have learned were useful in solving this problem?				
• What uses of mathematics did you find in the newspaper last night?				
• Can you give me an example of...?				
To encourage reflection, ask...				
• How did you get your answer?				
• Does your answer seem reasonable? Why or why not?				
• Can you describe your method to us? Can you explain why it works?				
• What if you had started with... rather than...?				
• What if you could only use...?				
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To encourage reflection, ask... (continued)				
• What have you learned or found out today?				
• Did you use or learn any new words today? What did they mean?				
• What are the key points or big ideas in this lesson?				
To help students build confidence and rely on their own understanding, ask...				
• Why is that true? How did you reach that conclusion?				
• Does that make sense?				
• Can you make a model to show that?				
To help students learn to reason mathematically, ask...				
• Is that true for all cases? Explain.				
• Can you think of a counterexample?				
• How would you prove that?				
• What assumptions are you making?				
To check student progress, ask...				
• Can you explain what you have done so far? What else is there to do?				
• Why did you decide to use this method?				
• Can you think of another method that might work?				
• Is there a more efficient strategy?				
• What do you notice when...?				
• Why did you decide to organize your results like that?				
• Do you think this would work with other numbers?				
• Have you thought of all the possibilities? How can you be sure?				
To help students collectively make sense of mathematics, ask...				
• What do you think about what _____ said?				
• Do you agree? Why or why not?				
• Does anyone have the same answer but a different way to explain it?				
• Do you understand what _____ is saying?				
• Can you convince us that your answer makes sense?				
To encourage conjecturing, ask...				
• What would happen if...? What if not?				
• Do you see a pattern? Can you explain the pattern?				
• Can you predict the next one? What about the last one?				
• What decision do you think he/she should make?				
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