

# Developing Deeper Math Thinking with Effective Questions

## To help students build confidence and rely on their own understanding, ask ...

- ◇ Why is that true/not true?
- ◇ How did you reach that conclusion? Explain.
- ◇ Does that make sense? What might make more sense in this situation?
- ◇ Can you make a model or draw a picture to show that?

## To help students learn to reason, ask ...

- ◇ Is that true for all cases? Explain.
- ◇ Can you think of a counterexample?
- ◇ How would you prove or disprove 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?
- ◇ When did you decide to use this method?
- ◇ Can you think of another method that might have worked?
- ◇ 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 content, 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 the rest of 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?
- ◇ What are some possibilities here?
- ◇ Can you predict the next one? What about the last one?
- ◇ What decision do you think he/she should make?

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## To promote problem solving, ask ...

- ◇ What do you need to find out?
- ◇ What information do you have?
- ◇ What strategies are you going to use?
- ◇ Will you do it mentally? With paper and pencil? Using a number line? Will a calculator help?
- ◇ What tools will you need?
- ◇ What do you think the answer or result will be?

## To help when students get stuck, ask ...

- ◇ How would you describe the problem in your own words?
- ◇ What do you know that is not stated in the problem?
- ◇ What facts do you have?
- ◇ 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?
- ◇ Have you compared your work with anyone else? What did other members of your group try?

## To make connections among ideas and applications, ask ...

- ◇ How does this relate to ... ?
- ◇ What ideas that we have learned before 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 all? Can you explain why it works?
- ◇ What if you had started with ... rather than ... ?
- ◇ What if you could only use ... ?
- ◇ What have you learned or found out today?
- ◇ Did you use or learn any new words today? What did they mean? How do you spell them?
- ◇ What are the key points or big ideas in this lesson?