What Should I Know About Problem Solving?

**A problem solver** is someone who questions, finds, investigates and explores solutions to problems; demonstrates the ability to stick with a problem to find a solution; understands that there may be different ways to arrive at an answer; and applies math successfully to everyday situations.

Students frequently jump into problem solving by looking for the numbers in a problem and immediately trying some calculations. As students work through each step, they should ask themselves some of the following questions.

**Understand**

While students are working through the understand step, they should realize that it is not just ok, but in most cases necessary to read the problem several times.

- Do I see pictures in my mind? How do they help me understand the situation?
- What do I know for sure?
- What do I want to know, figure out, find out or do? Do I have a sense of what my answer might look like?
- What does this situation remind me of?
- Is this related to things I’ve seen anywhere?

**Plan**

In the plan step, students decide how to solve the problem and when possible estimate a solution. It may be necessary to go back and read the problem again as you develop a plan.

- What representations can I use to help me solve the problem?
- Which problem solving strategy will help me the most in this situation?
- What is the big idea from math that is happening here?
- Is there something that I’ve done before that will help me solve this problem?

**Solve**

Students actually solve the problem in this step. However, they should still be reflective thinkers, asking the questions below. They may also need to go back to the understand or plan step if the plan is not working.

- Is my strategy working?
- Do I see any patterns?
- Should I try another strategy?
- Do I need to go back and read the problem again?

**Look Back**

Looking back requires the students to check for accuracy in their arithmetic as well as reasonableness of their answers.

- Does my answer make sense for the problem?
- Is there a pattern that makes the answer reasonable?
- Is there another way to do this?
- Have I made an assumption?
- Did I use the math concepts that I thought would be using?

Poor problem solvers fail to spend adequate time thinking about the problem and what it is about. They rush in and begin doing calculations, believing that “number crunching” is what solves problems.

-John Van de Walle
How Can I Help?

Here are some suggestions for parents helping at home:

- Let your children know you believe they can be successful in math.
- Encourage and support risk taking and celebrate perseverance.
- Encourage your children to solve problems with you. Help them identify different methods or strategies to use in finding solutions and resist the temptation to provide the answer or method. There is usually more than one way to solve a problem, and simpler strategies are often effective.
- Provide opportunities for your children to explain and justify their thinking.
- Connect mathematics to real life experiences. Emphasizing the mathematics around us helps to make mathematics education relevant.
- Be prepared for and supportive of different kinds of homework than what you experienced.
- Ask good questions of your children about their homework and be good listeners when your children respond.
- Encourage children to estimate answers and to check the reasonableness of their answers.

Good questions, and equally important, good listening can help children make sense of mathematics, build their confidence, and encourage mathematical thinking and communication. A good question opens up a problem and supports different ways of thinking about it. Some questions to try while helping a child might include:

- What do you already know about this?
- What do you need to find out?
- How might you begin?
- How can you organize your information?
- Can you draw a picture to explain your thinking?
- Are there other possibilities?
- What would happen if …?
- What do you need to do next?
- Can you describe the approach or strategy you are using to solve this?
- Do you see any patterns?
- Is your solution reasonable? Does it make sense?
- How did you arrive at your answer?
- Can you convince me that your solution makes sense?
- What did you try that didn’t work?

Parents should avoid stopping as soon as they hear the ‘right’ answer. Carefully worded responses, such as the following, give children a chance to clarify and extend their thinking:

- What do you think of that?
- Tell me more.
- Can you explain it a different way?
- Is there another possibility?

When your child gets stuck on a word problem, try to offer assistance without guiding their thought process.

Some children just need reassurance that they CAN be successful with the problem. Try suggesting some of these strategies:

- Jot Down Ideas
- Restate the Problem in Your Own Words
- Cross Out Unnecessary Information
- Substitute with Simpler Numbers
- Take a Break
- Use Manipulatives
- Talk the Problem Through
- Think of a Similar Problem
- Try a Different Strategy
- Give Yourself a Pep Talk

Graphic Organizers

Below you will find two sample graphic organizers that may be helpful in working through the problem solving process.

![Graphic Organizer Diagram]

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