Launch-Explore-Summarize

Students are given a problem and are given the context & expectations.

Students (often in collaboration) develop strategies and solutions.

Students reflect, share and work with the teacher to understand the mathematical concepts underlying the lesson's problem.

Mathematical Practices

1. MAKE SENSE of problems and persevere in solving them.
2. REASON abstractly and quantitatively.
3. CONSTRUCT viable ARGUMENTS and CRITIQUE the reasoning of others.
4. MODEL with mathematics.
5. Use APPROPRIATE TOOLS strategically.
6. Attend to PRECISION.
7. Look for and make use of STRUCTURE.
8. Look for and EXPRESS REGULARITY in repeated reasoning.

Practices from a Student's Perspective

This list is not exhaustive, but a good start.

1. Make sense of problems and persevere in solving them.
- I can re-read the problem.
- I can try to solve the problem in a different way.
- I can make connections to other problem.
- I can try to understand other's strategies.
- I don't give up!

2. Reason abstractly and quantitatively.
- I can represent and solve a situation mathematically.
- I can look at mathematical sentences and make sense of them.
- I can check that my result makes sense.

3. Construct viable arguments and critique the reasoning of others.
- I can justify my reasoning.
- I can find errors in mathematical reasoning.
- I can use examples to explain reasoning.
- I understand and use assumptions and definitions.
- I can use counterexamples appropriately.
- I can ask questions to clarify arguments.

4. Model with mathematics.
- I can use tools such as equations, diagrams, tables, graphs, flowcharts, and formulas.
- I can apply my models to practical situations.
- I can reflect on and revise my results if necessary.

5. Use appropriate tools strategically.
- I can bring my materials to class, daily.
- I can understand the limitation of a calculator, and its benefits.
- I can use multiple resources for graphing.
- I can use web resources effectively.
- I can estimate before solving a problem to know if my answer is reasonable.

6. Attend to precision.
- I can clearly communicate using math language.
- I can calculate accurately and efficiently within the context of the problem.
- I can use units appropriately.
- I can use definitions accurately and appropriately.

7. Look for and make use of structure.
- I can find patterns in my mathematical work and make generalizations.
- I can break down larger problems into smaller ones.
- I can connect smaller ideas together to form a larger one.

8. Look for and express regularity in repeated reasoning.
- I can identify patterns.
- I can look for efficient methods and shortcuts.
- I can attend to details.

Assisting your Child with HOMEWORK (Practice Opportunities)

Practice and discussion are required to understand mathematics. When your child comes to you with a question about a homework problem, often you may simply need to ask your child to read the problem and then ask what the problem is asking. Reading the problem aloud is often more effective than reading it silently. When you are working problems together, have your child talk about the problems. Then have your child practice on his/her own.

Below is a list of additional questions to use when working with your child. These questions do not refer to any particular concept or topic. Some questions may or may not be appropriate for some problems.

- What have you tried? What steps did you take?
- What didn't work? Why didn't it work?
- What have you been doing in class or during this chapter that might be related to this problem?
- What does this word/phrase tell you?
- What do you know about this part of the problem?
- Explain what you know right now.
- What do you need to know to solve the problem?
- How did the members of your study team explain this problem in class?
- What important examples or ideas were highlighted by your teacher?
- Can you draw a diagram or sketch to help you?
- Which words are most important? Why?
- What is your guess/estimate/prediction?
- Is there a simpler, similar problem we can do first?
- How did you organize your information? Do you have a record of your work?
- Have you tried drawing a diagram, making a list, looking for a pattern, etc.?

If your student has made a start at the problem, try these questions.

- What do you think comes next? Why?
- What is still left to be done?
- Is that the only possible answer?
- Is that answer reasonable?
- How could you check your work and your answer?
- How could your method work for other problems?

If you do not seem to be making any progress, you might try these questions.

- Let's look at your notebook, class notes, and Toolkit. Do you have them?
- Were you listening to your team members and teacher in class? What did they say?
- Did you use the class time working on the assignment? Show me what you did.
- Were the other members of your team having difficulty with this as well? Can you call your study partner or someone from your study team?

This is certainly not a complete list; you will probably come up with some of your own questions as you work through the problems with your child. Ask any question at all, even if it seems too simple to you.

To be successful in mathematics, students need to develop the ability to reason mathematically. To do so, students need to think about what they already know and then connect this knowledge to the new ideas they are learning. Many students are not used to the idea that what they learned yesterday or last week will be connected to today's lesson. Too often students do not have to do much thinking in school because they are usually just told what to do. When students understand that connecting prior learning to new ideas is a normal part of their education, they will be more successful in this mathematics course (and any other course, for that matter). The student's responsibilities for learning mathematics include the following:

- Actively contributing in whole class and study team work and discussion.
- Completing (or at least attempting) all assigned problems and turning in assignments in a timely manner.
- Checking and correcting problems on assignments (usually with their study partner or study team) based on answers and solutions provided in class and online.
- Asking for help when needed from his or her study partner, study team, and/or teacher.
- Attempting to provide help when asked by other students.
- Taking notes and using his/her Toolkit when recommended by the teacher or the text.
- Keeping a well-organized notebook.
- Not distracting other students from the opportunity to learn.

Assisting your child to understand and accept these responsibilities will help him or her to be successful in this course, develop mathematical reasoning, and form habits that will help her/him become a life-long learner.

Additional support for students and parents is provided at the CPM Homework Help site: http://www.cpm.org/students/homework/

The website provides a variety of complete solutions, hints, and answers. Some problems refer back to other similar problems. The homework help is designed to assist students to be able to do the problems but not necessarily do the problems for them.