Use cognitive and metacognitive questions to help you learn

Effective problem-solving requires thinking about how you think! It's helpful to know the difference between metacognitive strategies (i.e. "thinking about how you best learn mathematical concepts/skills") and cognitive strategies ("interacting with the specific information to understand it"). Next time you start to solve a problem, see if thinking through your responses to these questions can help you focus your efforts.

Metacognitive strategies

Advance organization	What's the purpose in solving this problem? What is the question? What is the information for?
Selective attention	What words or ideas cue the operation or procedure? Where are the data needed to solve the problem?
Organizational planning	What plan will help solve the problem? Is it a multi-step plan?
Self-monitoring	Does the plan seem to be working? Am I getting the answer?
Self-assessment	Did I solve the problem/answer the question? How did I solve it? Is it a good solution? If not, what else could I try?

Cognitive strategies

Elaborating prior knowledge	What do I already know about this topic or type of problem? What experiences have I had that are related to this? How does this information relate to other information?
Taking notes	What's the best way to write down a plan to solve the problem? Table, chart, list, diagram…
Grouping	How can I classify this information? What is the same and what is different (from other problems I have encountered, from other concepts in the class…)
Making inferences	Are there words I don't know that I must understand to solve the problem?
Using images	What can I draw to help me understand and solve the problem? Can I make a mental picture or visualize this problem?

Many students find these types of questions boring or irrelevant and simply want to blast through all the problems, but it's important to remember the actual purpose of solving problems (at least in homework, if not on a test): figuring out and then practicing new and different ways to solve a type of problem. The *process* is what matters, not getting the result as quickly as possible. Focusing on the process helps you to become more accurate and efficient, and it will save you time in the long run.