PROBLEM SOLVING STEPS

Inspired by Student Achievement Division of Ontario Schools and McGraw-Hill. Produced by Natasha Hutchins at www.prodivame.com

1 UNDERSTAND

EXPLORE
View/listen/read the problem carefully. Ask yourself questions like "What facts do I know?" and "What do I need to find out?"

Guiding Questions to Understand the Mathematical Task and its Context
What Math am I investigating?
What information am I going to use to solve this problem?
What is the goal of the procedure?
What sort of answer(s) should I expect?
How can I predict or estimate the outcome?
What questions would be useful to ask?
What does _____ mean?

Guiding Questions to Establish Connections and Activate Prior Knowledge
What other problem have I solved that is similar to this one?
What does this make me think of?
What other Math can I connect with this?
When do I use this Math at home? At school? In other places?
Where do I see _____ at school? At home? Outside?
What do these _____ have in common? What is unique about each of them?
How is this like something I have done before?

2 PLAN

PLAN
See how the items/information/facts relate to each other. Make a plan for solving the problem. Estimate the answer.

Guiding Questions to Share Representations
How will I show my thinking (e.g., picture, model, number, sentence)?
Which Math words will I use to describe my experience?
How will I show your solution?
How would I explain _____ to a student aged _____?

Guiding Questions to Predict, Invent or Solve
What would happen if _____?
How else might I have solved the problem?
What are the steps?
How else could I do it?
How could I prove that?
How will I know my answer is reasonable?

3 ACT

SOLVE
Use your plan to solve the problem. If your plan does not work, revise it or make a new one.

Guiding Questions to Clarify Reasoning and Understanding
How do I know?
How do I know my answer is reasonable?

Guiding Questions to Focus on Communication
What could I add to my solution to make it clearer for the reader?
How can I represent my thinking?

Guiding Questions to Make a Conjecture
What would happen if _____?
Would this work every time? Can I think of any examples that don't work?

Guiding Questions to Reflect
What questions are arising as I work?

Guiding Questions to Share Representations
Which way (e.g., picture, model, number, sentence) best shows what I am finding?

4 REFLECT

EXAMINE
Revisit the problem. Ask, "Is my answer close to my estimate? Does my answer make sense for the problem?" If not, solve the problem another way.

Guiding Questions to Reflect, Clarify Reasoning and Understanding
What was my thinking when I made decisions or selected strategies to solve the problem?
What changes did I have to make to solve the problem?
What was the most challenging part of the task? And why?
How could I arrive at the same answer but in a different way?
How would I explain what _____ just said, in my own words?

Guiding Questions to Reason Mathematically
Have I found all the possibilities?
How do I know?

Guiding Questions to Compare Solutions and Look for Commonalities
How is this solution similar to or different from the others?

Guiding Questions to Synthesise Learning and Articulate Generalisations
What have I discovered about _____ while solving this problem?
What have I learned today?