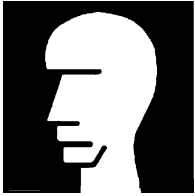


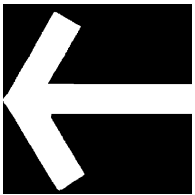
# Problem Solving Strategies

## Use Logical Reasoning



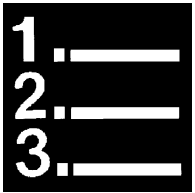
The Use Logical Reasoning strategy will be helpful to solve problems that have phrases or can be rephrased to say things like "if...then" or "if something is true, then..." or "if something is false, then..." This strategy is also useful when matching two sets of information. The best way to put this strategy into practice is to create a logic grid with information sets placed on different sides of the grid allowing pairings to be eliminated and matched.

## Work Backwards



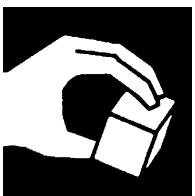
This strategy is used when the most important and/or useful piece of information in the problem comes at the end (often with a series of events that involve percents or fractions) and where students need to work to is near the beginning. To use this strategy, start with data at the end of the problem and complete the necessary steps going back to the beginning question or statement. It helps to label or organize each step of the process while working backwards through the information for easy checking.

## Make an Organized List



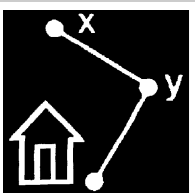
The Organized List Strategy can be used to solve problems that require the number of combinations of items (phrases like "how many combinations ..." or "how many ways...") or number of different items to provide a given total (how many of each item provide this total). The key to using this strategy is to make sure the list created is organized. For the type of problems that want the number of combinations, list the options across the top or side and start listing combinations exhausting one option before moving on to the next. For the other type of problems make lists of the various items to find which number of each add to the correct total.

## Act Out or Use Objects



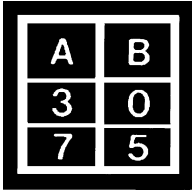
Using objects or acting out solutions is helpful when needing to visualize the relationship between the information presented in the problem. It is extremely useful when problems ask for an arrangement of items listed. To use this strategy, any items can be used to represent the items given in the problem, such as labeled scraps of paper. Moving the objects around using the information presented in the problem it becomes easy to find the correct arrangement.

## Make a Picture or Diagram



An important thing to keep in mind with this strategy is that pictures or diagrams do not have to be beautiful or well drawn, as long as they help provide a visual image to help understand and work with the data. This strategy is especially useful for any problems that involve mapping or directions. When setting up this strategy make sure the picture or diagram created is well labeled and then simply follow the set of information presented in the problem and you have accurately included the information from the problem.

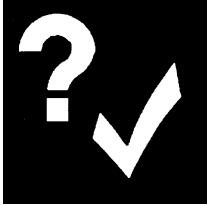
## Use or Make a Table



A	B
3	0
7	5

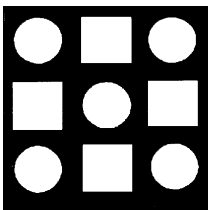
A table is simply a way to make an organized arrangement of information. Because patterns are also found when organizing information, this strategy is often used along with other strategies. Using or making a table is helpful when problems require you to keep track of groups of information or to find when two sets of information match up. To set up a table make sure it is accurately labeled and you know whether or not you need a total for each row/column to correctly answer the question asked.

## Guess and Check



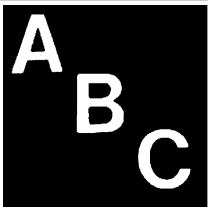
The Guess and Check Strategy is used when there are two or more things that need to be solved for and, while there are clues, there are not many numbers to use. Often there will be a total of items and the problem will want you to figure out the amount of each item. To use this strategy, take the clues from the problem and set up number sentences and start making guesses to solve for the unknown items and check to see if you are correct. The key is to make *educated* guesses (for example if the total of three items is 30 an educated guess for one of the items would be ten) and adjusting your guess up or down depending on how far off your answer is from the information in the problem.

## Use or Look for a Pattern



Phrases like "at the same rate..." and "keeps happening in the same way..." or information that tells about something happening each day or hour indicate that there is a pattern involved in solving the problem. Sometimes the pattern will be obvious and/or told to you in the problem and sometimes the pattern will be discovered by organizing it. To use this strategy, organize and label the information provided to determine how much further the pattern needs to go in order to solve the problem.

## Make it Simpler



Making it Simpler is a strategy that is needed when a large number or amount is presented and breaking it down into a smaller number or amount will help reveal the relationship and or pattern between the information presented. When the problem asks for the result of a larger number use this strategy by figuring out the result of one item and then two items and see if a relationship or pattern can be found that will make it easier to figure out the larger answer.

## Brainstorm



This is the strategy when there doesn't seem to be any other options. While there is some element of brainstorming in all problem solving, using this strategy by itself is very rare. The times when this is the only strategy used is when there is virtually none or little information or clues given in the problem. Often these are the problems that appear to be "trick questions" that don't seem to have a possible solution. The best way to use this strategy is to try to think about the information presented a new or different way. Think about other meanings for words or phrases or different contexts that the information might fit with. In order to show work for these problems, simply write down the different phrases and words you think through as you try to solve the problem.