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Everyday Math 1

Problem Solving Math for Primary Students

Stimulating 'word' problem solving activities for Grade 2 - 3 students.

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Teachers' Notes

The activities in this book are designed to present real-life problems in a realistic context so as to provide children with situations in which everyday math comprehension skills are required. The tasks also provide a foundation for the development of problem solving skills and strategies.

The activities are based around a set of recurring characters who find themselves exposed to a range of real-life problems that need to be solved; the sort of problems that students may one day encounter. Many of the activities can be described as math comprehension questions where students are presented with the facts and need to determine ways to manipulate them in order to solve the problem.

Ideally the pages should be completed in order as several of the activities are related. Activities with two parts must be completed together as the information from one page will be required when working on the second page. Photocopy these back and front.

Many pages also include a challenge activity which is often an extension of the main problem. Included at the end of the book are a list of brain-teasers that explore lateral and rational thinking. The answer is usually not as obvious as it looks. The ten brain-teasers can be photocopied and individually glued on to card so as to create a set. Students might like to think up their own brain-teasers to add to the set.

Problem Solving Strategies
There are many strategies for solving every day math problems. Some of the main problem solving strategies have been explained below. In some cases examples of problems are given where the particular strategy can be applied.

Guess and check: Probably the first strategy children might try and definitely the easiest. By making a guess and checking their answer children have a point of reference on which to base all other guesses.

An example : A field contains two kinds of crazy creatures - Trogs with three legs and Quags with four legs. There are 31 legs altogether. How many Trogs and how many Quags are in the field?

Act it out: Students quite often need to visualize the problem, especially where people or objects are concerned. Counters, coins, and students can be used to help solve the problem.

An example: There are 12 players in the tennis championship. Each player stays in the competition until they lose a game. How many games must be played to find the club champion?

Make a model: When problems cannot be acted out the next best thing is to make a model using cubes, matches, and so on.

Make a drawing, diagram or graph: Graphs and diagrams are particularly useful for trying different combinations or clarifying information.

An example: Fast Harry's gives away one free drink with every four hamburgers. If a family buys 24 hamburgers, how many free drinks will they receive?

Look for a pattern: This strategy can be used in many number and space activities to help simplify the problem:

Number patterns: One child has two shoes, two children have four shoes, how many do eight children have?

Spatial patterns: How many squares are there on a checker board?

Construct a table: By organizing data in a more meaningful way children can better see relationships, patterns, and possibly missing information. This strategy is best used where different information is given about each person or object in the problem. A table can include all the information and eliminate irrelevant information.

An example: Al, Bert, Cath, and Dino each play sport over the weekend. They all play a different sport.

Match the person to their sport based on the following:

Al doesn't like swimming but loves baseball

Bert likes hockey more than swimming

Cath uses a racket

Dino doesn't play hockey or baseball

	Swimming	Baseball	Tennis	Hockey
Al	✗	✓		
Bert	✗			✓
Cath			✓	
Dino	✗			✗

The solution can be found through the process of elimination.

Make a list: All possibilities can be listed when using this strategy and again the process of elimination can be used.

An example: You have three T-shirts: red, blue, and yellow; and four pairs of jeans: green, black, navy, and light blue. How many different combinations can you wear?

Restate the problem: This is best used to make sure students fully comprehend the problem and know what they need to do to find the solution.

*An example: S*arah bought 3 new numbers for her mailbox, a 1, a 4, and a 7. What could her street number be?

This could then be rephrased as: What are all the combinations I can make using a 1, a 4, and a 7?

Solve a simpler problem: By exploring a simpler problem, an apparently difficult task can be made easier. Students can look for a pattern and then transfer this pattern to the larger problem.

An example: There are 300 pages in a book. How many pages will have at least one "2" on them?

First, students could solve how many 2's there are in 1-100, then between 101-200. Between 200-300 every page is counted, because every page starts with a 2.

Account for all possibilities: This strategy can be used in addition to some of the strategies already mentioned such as making a list.

An example: Emily is buying a can of soda at a vending machine. The can costs $1.30. How many different combinations of coins can she use if the machine takes $1, 50¢, 20¢, 10¢ and 5¢ coins?

Use logical reasoning: This strategy involves students using what they already know to solve a problem. A solution can be reached when logical reasoning is used to draw conclusions about mathematics. Strategies involve using models, known facts, properties, and relationships to explain thinking.

An example: Lesley has three pets: a fish, a kitten, and a bird. Their names are Freddy, Kenny, and Benny. The name of each pet and the kind of pet it is do not start with the same letter. Kenny is not a fish. What are their correct names?

Work backwards: This strategy works best when a problem is stated so that the final outcome is clear. In such a case the condition that existed earlier needs to be determined.

An example: Michael picked some apples with Sam and Brian at Farmer Frank's farm. Michael picked twice as much as Sam and Brian picked 5 less than Sam. If Sam picked 8 apples, how many did the others pick?

Tips for Students

Perhaps these suggestions could be put on a chart for wall display.

- ☆ Make sure you understand the problem.
- ☆ Have a go even if you just play around with the problem.
- ☆ Try a variety of strategies.
- ☆ Learn from your mistakes.
- ☆ Keep a record of your working out for the bigger problems so that you can refer back if needed.
- ☆ Check your answers.