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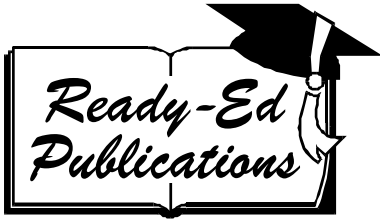
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# Timed Math Problems

Problem Solving Math  
for Intermediate Level  
Students

Stimulating 'word' problem solving  
activities for 8 - 10 year old students.

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# Timed Math Problems

## Introduction

The '*Timed Math Problems*' book presents a range of problem solving techniques in a gradually more complex way as each section of the book is encountered. This enables problems to be grouped according to the time intended for an activity to be completed; 5 minutes, 10 minutes, or 15 minutes. Naturally, these times are arbitrary and will range widely depending upon the abilities of the students, but the opportunities exist to extend students by presenting problems as a challenge to be completed within the specified time. The Teachers' Notes section gives an outline of the various strategies that the students will use as they attempt the problems.

The problems in this book are ideally suited to a math learning centre set up in the class room. The problems can be copied, cut up, and placed in boxes with students selecting a problem from the appropriate box, depending on how much time they have.

SAMPLE

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# Teachers' Notes

The problems in this book require the use of the range of strategies detailed in these notes. Teachers may choose to introduce the activities by explaining the strategies before assigning the problems. With this in mind, the initial use of each section in this book incorporates explanation and examples for students to consider, before attempting the problems themselves.

**Making a List:** This strategy involves examining all the possibilities for a solution by listing the various elements in the problem. The technique can be used when information has to be gathered and checked in order to cover a variety of possibilities.

**Example:** Sam has an orange, a banana, and yoghurt in his lunch box. List all of the different combinations he could eat them in.

- orange, banana, yoghurt*
- banana, orange, yoghurt*
- yoghurt, orange, banana*
- yoghurt, banana, orange*
- banana, yoghurt, orange*
- orange, yoghurt, banana*

There are six combinations.

**Guess and Check:** This is a good strategy to use when introducing children to problem solving. As its name suggests the children guess an answer to the problem, use the guess to reach an approximate answer and then attempt the problem. When an answer is obtained the guess is modified so that an answer which is closer to the correct one can be gained.

**Example:** A farmer has 55 cows and sheep in total. If he has nine more cows than sheep, how many of each does he have?

The first guess might be 25 cows. If this is true then there would be 16 sheep, making a total of 41 animals altogether. This guess is too low so a higher guess can be made until the student works out that there must be 32 cows and 23 sheep.

A table can be used to check guesses.

Number of cows			
Number of sheep			
Total			

**Find a Pattern:** This requires the problem solver to find a pattern in the information given. This must then be continued on to find the answer.

**Example:** □, △, ○, □, .....

The answer is □, △, ○, □, △, ○.

**Solve an Easier Version of the Problem:** This strategy is similar to Finding a Pattern. The student finds the solution to a complex problem by working out an easier version and then applying the same rules to the harder version.

**Example:** There are 30 people at a meeting. Everyone shakes hands with each person once. How many handshakes take place?

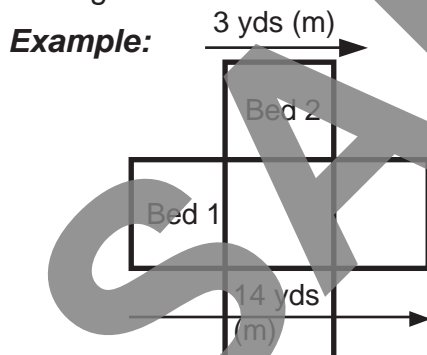
Students could first work out how many handshakes would occur with a group of five and then look for a pattern to apply to the more difficult problem.

**Logical Reasoning:** This strategy helps students to develop skills in deductive reasoning by allowing them to use what they already know to solve the problem. Students develop a hypothesis and then check their answer as opposed to guessing the answer. Clues should be written down in the grid as shown.

**Example:** Jennifer and Neil went to a fancy dress party. The boy wore a cowboy suit. The girl wore a pirate suit. What did Neil go as?

	Cowboy	Pirate
Neil	yes	no
Jennifer	no	yes

**Create a Diagram:** This strategy requires the students to draw a diagram of the problem which can then be used to provide a solution. It is particularly useful with problems relating to area.



Julie has two identical garden beds that form a cross. Bed 1 is 14 yards (meters) long and Bed 2 is 3 yards (meters) wide. What is the distance around the edge of the garden.

**Working Backwards:** This strategy works best when a problem is stated so that the final outcome is clear. It is necessary to determine the range of events that occurred that produced the result.

**Example:** Sebastian has saved \$30 in his account this week. Each week he saves \$5 more than the week before. How much did Sebastian save three weeks ago?

If Sebastian saved \$30 this week he must have saved \$25 last week and \$20 the week before. This can be written into a table.

Money saved:	\$30	\$25	\$20	\$15	\$10
Weeks ago:	This week	one	two	three	four

From the table we can see that Sebastian must have saved \$15 three weeks ago.

Name .....

# Student Record Sheet

## 5 Minute Problems: Making a List

1     2     3     4     5     6     7     8

## 5 Minute Problems: Guess and Check

1     2     3     4     5     6     7     8

## 5 Minute Problems: Find a Pattern

1     2     3     4     5     6     7     8

## 5 Minute Problems: Solve an Easier Version

1     2     3     4     5     6     7     8

## 5 Minute Problems: Logical Reasoning

1     2     3     4     5     6     7     8

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## 10 Minute Problems: Making a List

1     2     3     4     5

## 10 Minute Problems: Create a Diagram

1     2     3     4     5

## 10 Minute Problems: Logical Reasoning

1     2     3     4     5     6

## 10 Minute Problems: Guess and Check

1     2     3     4     5

## 10 Minute Problems: Find a Pattern

1     2

## 10 Minute Problems: Working Backwards

1     2     3     4     5

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## 15 Minute Problems: Mixed

1     2     3     4     5

6     7     8     9     10