

# Maths Problem-Solving Brain Teasers

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## Introduction

Learning and using problem-solving strategies should be approached by using ideas that make sense to the learner. Abstract concepts practised without meaning are sometimes fruitless for many students. The problems in this book are meant to provide an atmosphere of problem-solving that allows the student to see the practicality and fun of mathematics.

It is suggested that you use *Maths Problem-Solving Brain Teasers* to create interesting classroom projects or as a supplemental tool for students who need more than the curriculum offers. If you or a student can think of a way to extend an exercise or change it, feel free to do so.

Use the information on page three to teach students how to organise for solving problems. Each student should have a plan as to how he or she will solve the problem. Showing steps and collecting necessary data are ways to approach each exercise. Many of these problems can be completed with other students. Analysing and comparing work makes it possible for students to 'see' what good work might look like. If none of your students are able to produce a reasonable response, formulate one yourself and use it as a model of good work. Students must see, touch, and understand in order to learn. Students do not learn when they keep repeating failure. Ensure success by making certain that all work is complete and that the exercise is easy to understand for the reader. Students should produce papers that can be understood by anyone who reads them.

As the exercises in this book are completed, have the students save their papers to use as references or models for upcoming activities in which similar problem-solving strategies are employed. In addition, if references are made to previous exercises, those exercises will be available. This book should be used to supplement the textbook with activities that encourage students to expand their thinking. The exercises serve as a springboard from which you as the teacher can create additional problem-solving activities to engage the class.

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## It's About Time

Time is counted as years, months, weeks, and days. It can be further divided into hours, minutes, and seconds. Calculate how long you have been alive in terms of these units. If necessary, refer to the table of time equivalencies. Then determine how you spend a 24-hour day. How much time do you spend sleeping, eating, watching TV, playing, studying, travelling, etc? Show the results in a pie chart. Record your results in the chart at the bottom of the page.

**Table of Time Equivalencies**

	Month	Weeks	Days	Hours	Minutes	Seconds
<b>Year</b>	12	52	365	8,760	525,600	31,536,000
<b>Month</b>		4	30 (avg.)	720	432,00	2,592,000
<b>Week</b>			7	168	10,080	604,800
<b>Day</b>				24	1,440	86,400
<b>Hour</b>					60	3,600
<b>Minute</b>						60

Present age: \_\_\_\_\_ years \_\_\_\_\_ months \_\_\_\_\_ weeks \_\_\_\_\_ days

### My 24-hour Day

Activity	Hours	Minutes	Seconds



## Behave Yourself

Psychologists study behaviour. They are very interested in how long it takes an animal or a human to change in some way.

The following activity involves the study of human behaviour. You will need a clock or watch with a second hand or a stopwatch. Ask five people to help you with your study. In this activity, you will observe your problem-solving subjects performing several tasks. For the first task, make a complicated maths problem. Time how long it takes each subject to complete it correctly. For the second task, mix up the letters of a long word and time how long it takes each person to find the word. For the third task, ask each subject to hum the same short song, like 'Happy Birthday' or 'Row Your Boat.' Time this. Use the chart below to record your results. Write a conclusion on the back of this paper.

<b>Task 1</b>	
<b>Problem:</b>	<b>Results:</b>  subject 1 _____ subject 2 _____ subject 3 _____ subject 4 _____ subject 5 _____
<b>Task 2</b>	
<b>Mixed-up Word:</b>	<b>Results:</b>  subject 1 _____ subject 2 _____ subject 3 _____ subject 4 _____ subject 5 _____
<b>Task 3</b>	
<b>Song Chosen:</b>	<b>Results:</b>  subject 1 _____ subject 2 _____ subject 3 _____ subject 4 _____ subject 5 _____