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PHOTOCOPY MASTERS

For 9 - 10 years

Maths Problem Solving Series

Strategies and techniques covering all strands of the curriculum, with activities to reinforce each problem solving method.

By Val Morey

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The Longest Throw

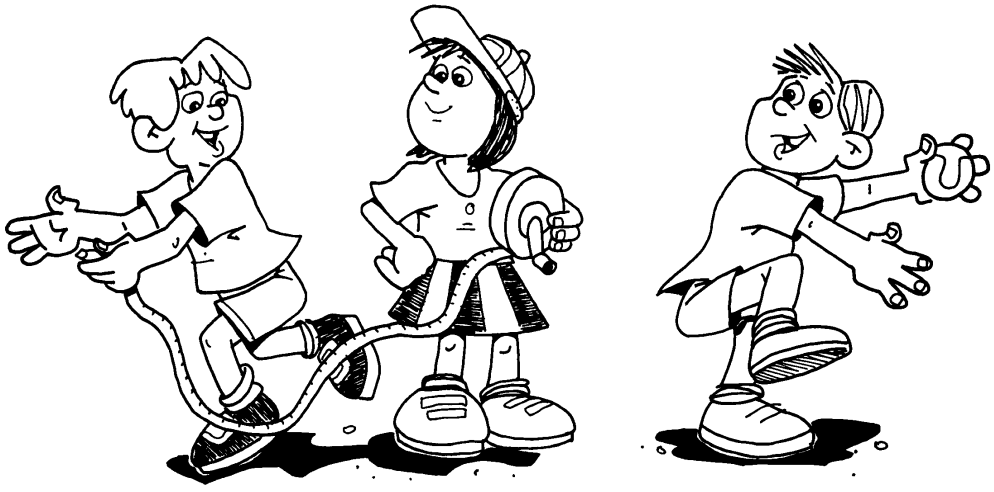
You can use the "Guess and Check" strategy to solve practical problems of Measurement as well. The only difference is that you are working with length, mass, area or volume and capacity instead of just with numbers.

❑ Try using the strategy to solve this:

Your school sports day includes an event of "longest throw", where each person throws a softball as far as they can. At a training session for the sports, one of your friends threw the ball 50 centimetres further than you. The combined distance of both of your throws was 49.5 metres. What was the distance of each of your throws?

Solve the problem using the "Guess and Check" strategy.

Use this space to draw up a grid. Work out what headings you will need.



WM 3.2
WM 3.3 Understands mathematic conjectures as more than simply a guess, makes straightforward tests of conjectures and discards those that fail the test.
N 3.14 Calculates with whole numbers, money and measures.

Favourite Flavours

❑ For this next problem, you will need to "Guess and Check" to get the data (information) for a graph.

You need to use A4 1 centimetre graph paper to graph the results of a survey about students' choices between three ice cream flavours. Each centimetre mark on the vertical axis of your graph should stand for 2 people. You decide how wide the columns should be.

Altogether 64 students took part in the survey.

16 students said chocolate was their favourite, and this was the least popular choice. Of the rest, 4 more chose caramel than chose bubble gum.

❑ Use the space below to problem-solve and then prepare the graph of the results on your graph paper.

WM 3.2
WM 3.3 Understands mathematic conjectures as more than simply a guess, makes straightforward tests of conjectures and discards those that fail the test.
C&D 3.26 Displays frequency and measurement data using simple scales on axes and some grouping.

A Sweet Problem

The strategy of making a list can also be useful for finding out the number of possible ways things can be placed in order. For instance, if you had a lollipop and an ice cream, no doubt you can see that there are *two* possible orders in which you can eat them - although only one sensible way, if you don't much like melted ice cream!

However, if you had a Mars Bar, a giant snake and a lollipop, would there then be *three* possibilities for the order in which you could eat them?

❑ You can check by making a **systematic list**. Start by writing the first item first and then write the other two in two different orders, like this:

Mars Bar, snake, lollipop
Mars Bar, lollipop, snake

❑ That's two possible ways. Now write the second item first and do the same thing:

Snake, _____

Snake, _____

❑ That's four possibilities. Now the third item first:

_____

_____

So, you can see that there are actually **six** possible orders.

❑ Now try the question below. Use the same listing system that you did for the lollies, but be careful, because now there are 4 items - you may be surprised how much difference that makes!

☆ You are colouring a border on your work and want to make a repeat pattern with the colours red, yellow, blue and green. In how many different orders could you use the colours?

_____

_____

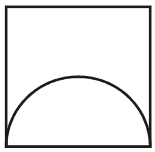
_____

WM 3.2, 3.3 Recognises, describes and uses patterns involving operation on whole numbers, and follows and describes rules
N 3.12 for how terms in a sequence can be linked by multiplication or an addition or subtraction based strategy.

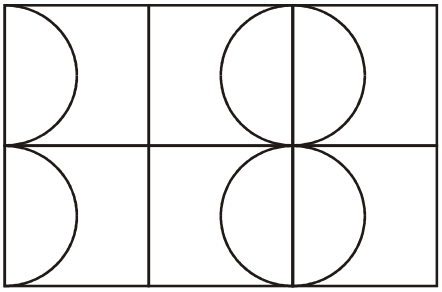
Try Tiling - 1

❑ Have you ever looked at a pattern on carpet or on tiles on the floor or the wall? If you have, you may have been able to see that patterns are sometimes made by turning squares or circles a certain way and then joining them up.

Look at the picture of this square tile:



If several of these tiles were placed next to each other in a particular way, a pattern could be made:



You should be able to see what would happen if more tiles were added to keep the pattern going.

❑ Can you use the same tile, but arrange several of them differently to make a new pattern? Remember, you cannot change the design of the tile, but you can turn each tile any way you wish. Use the space below to make your pattern. You can try out other arrangements on the back of this page.

WM 3.3
S 3.10 Recognises rotations, reflections and translations in arrangements and patterns and translates, rotates and reflects figures and objects systematically to produce arrangements and patterns.

Music Madness

The Music Teacher takes recorder lessons three times each week. At each lesson, she brings spare recorders for students who forget to bring their own. After each lesson the teacher has to clean these recorders in a sink. She puts 5 litres of water into the sink each time. How much water is used in a year to wash all the recorders?

❑ This time, try **solving an easier version** by changing the amount of time. Could you do it if you had to find out how much water was used in a week?

Write that calculation here:

❑ Now you may need to find out how many weeks there are in a school year - remember, there are no recorder lessons on school holidays!

Write your final calculation here:

A total of _____ litres of water is used to wash all the recorders in a year.

N 3.15 Calculates with whole numbers, money and measures (at least multipliers and divisors to 10) drawing mostly on mental strategies to add and subtract two digit numbers and for multiplications and divisions related to basic facts.