For 11 years+

Maths Problem Solving Series

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

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Going Round in Circles

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/capacity instead of just with numbers.

❏ Try using the strategy to solve this:

At training sessions for the interschool sports, two members of your school's running team practise on a 500 metre circular running track. At the last session, the combined distance run by the two of them in 10 minutes is 5020 metres, and one runner beat her friend by 40 metres.
Complete the grid to work out how many kilometres each person ran.

Show Time

❏ Now try this one:

Someone in your family has recorded two movies on a video tape, using up a total of 4 hours and 50 minutes playing time. You want to use the counter to find where the second movie starts, but you don't know how long each movie lasts. However, your sister tells you she thinks the second movie was about 20 minutes longer than the first one. What would you fast-forward (or rewind!) the counter to in order to find the beginning of the movie you want?


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.
M 4.18   Takes purpose and practicality into account when selecting attributes, units and instruments for measuring things and uses the relationship between metric prefixes to move between units.

Name: _____

Looking Good at School

Try this one on your own now, but be careful because this time you need to use the information about possible combinations in order to make a decision - it's the decision, not the number of combinations, which is the solution.

☐ You seem to have grown out of all your school uniform items but your mum is not keen to buy you all the items of the new uniform as you will be finishing primary school at the end of the year. You really don't want to have to wear exactly the same uniform combination every day. Your school uniform includes two different shirts, a jumper, a zippered jacket, track pants, shorts, a skirt and a dress. Girls may wear any of the items, but most boys choose not to wear the skirts or dresses! Your mum has said that she will buy the **minimum** amount needed so that you have a different combination each school day.
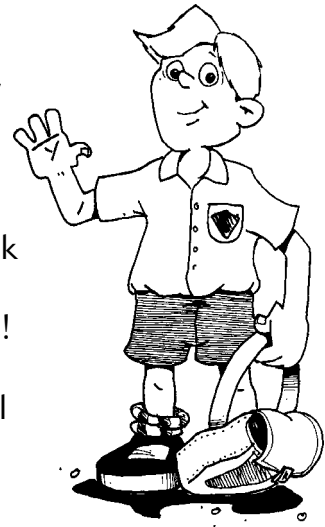
☆ What do you ask mum for?

List 1	List 2
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Combinations: (Start with the first item from List 1.)

_____

_____

_____

_____

_____

_____

☆ How many items must you have in order to wear a different combination each

day of the week? _____

Name: _____

Vexatious Vegie Garden

☐ Your class has decided to set up a vegetable garden and you have researched the sizes needed for what you want to grow. You will need a total area of 18 m². The school gardener has said you may have the space, but wants you to draw the proportions so that he can fit it neatly into one of the available spots in the school grounds.

You want to have a rectangular garden and now need to determine the lengths of the sides. If you keep to whole metres only for each side, what are the possibilities? Use the space below for your working.

☐ Unfortunately, none of those possible measurements will fit well into the positions the gardener has available. You have the idea that if you allowed two of the four sides of the rectangle to be measured into (whole) centimetres, that would create more possibilities.

Does it? _____   Try it below.

Your friend now says that all four sides of the rectangle could be measured in whole centimetres, not just whole metres, as that would then create even more possibilities and you would be sure to fit the garden in. You are horrified at that suggestion and say that it would take far too long to find all the possibilities. Instead, you suggest adding possibilities by trying shapes other than rectangles. Your friend reckons that would be more difficult.

☐ Can you prove yourself right? Use the back of this sheet to make your list.
(Note: You don't have to find all the possibilities; just demonstrate whose suggestion would be more workable.)

WM 3.3

M 4.19   Understands and applies directly length, area and volume relationships for shapes based on rectangles and rectangular prisms.

Teachers' Notes:
Solve an Easier Version

This strategy is similar to "Find a Pattern". The students find the solution to a complex problem by working out an easier version and then applying the same rules to the more difficult problem.

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.

The key lies in simplifying the variables - whether it be distances or size of spaces, numbers, or amounts of time, so that the student can be confident of the type of calculation which needs to be done. The variables should be simplified to the point where students will be sure their answer is correct, as this will then give them the confidence that their approach is appropriate.
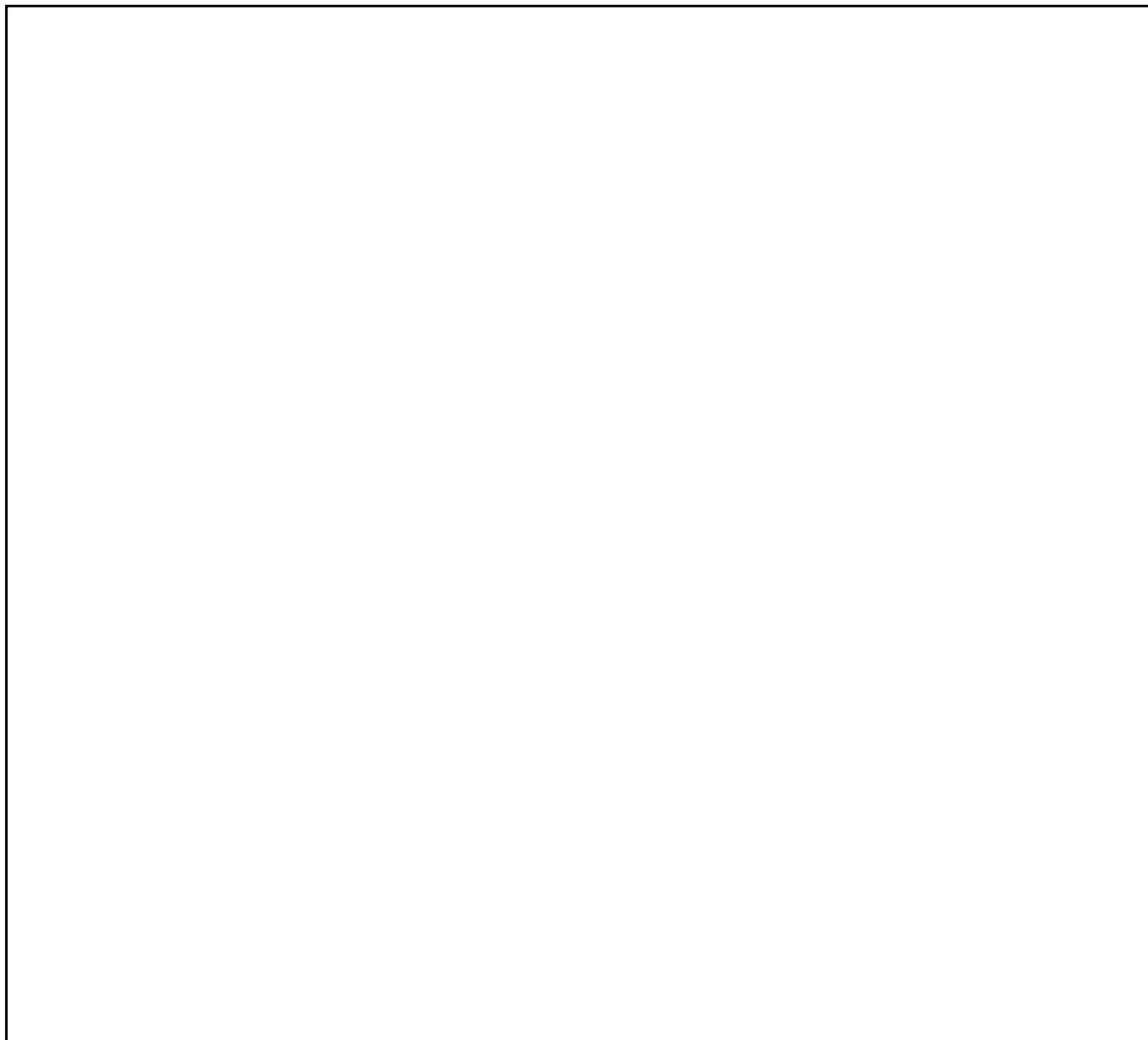
Student Information Page

You may have heard of or seen people drawing a picture to help explain something to someone. Often things then become clearer. Thus, the strategy of drawing organised diagrams can be helpful in problem solving. Once again, it is just another way of organising your information and dealing with the problem "bit by bit".

In the first task, you will need to draw a diagram to help solve the problem. However, if you think back to the "Make a List" strategy, you should be able to see that all you are doing here is making a list in diagrammatical form - using "pictures" instead of numbers or words.

Triangle Puzzle

Make some puzzles for younger students in your school by cutting a piece of A4 card into triangles. You need a total of seven triangles. One of the triangles must be half of the whole area of the paper. The children solve each puzzle by reassembling the triangles into the A4 rectangle.

☐ How many different puzzles are you able to make? Use the space to draw your "list of diagrams".

WM 3.3
S. 4.9   Selects, describes and compares figures and objects on the basis of spatial features, using conventional geometric criteria.
M. 4.19   Understands and applies directly length, area and volume relationships for shapes based on rectangles and rectangular prisms.
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