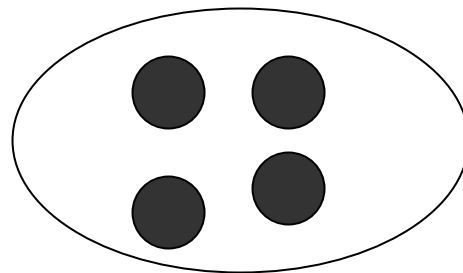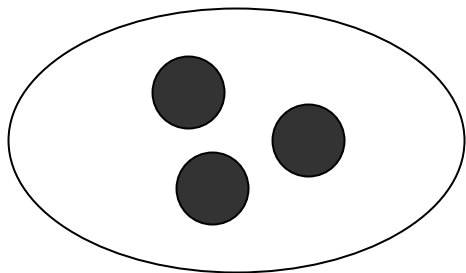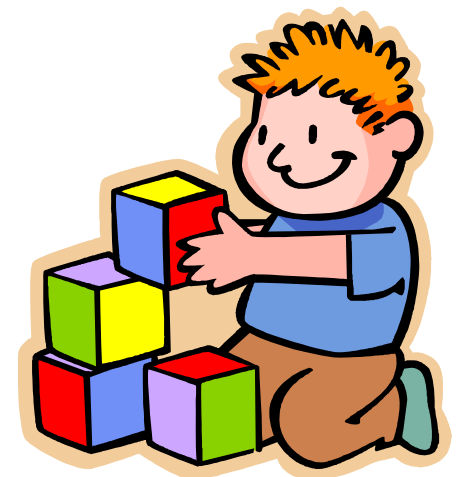# Act out or use objects

Work with a partner or group to act out the problem like a play. You can also use objects to help you, like counters, blocks, play-dough or paddle-pop sticks to make the problem.

E.g. I have three bananas and I am given 4 more, how many bananas do I have altogether?

The answer is 7

Make a drawing or diagram

Use pencils and paper to draw what's happening in the problem, like drawing pictures for a story or drawing steps of how to do something.

E.g. There were 27 strawberries in the field, they were in 3 rows. How many strawberries were in each row?

🍓🍓🍓🍓🍓🍓🍓🍓🍓
🍓🍓🍓🍓🍓🍓🍓🍓🍓
🍓🍓🍓🍓🍓🍓🍓🍓🍓

There are 9 strawberries in each row.

Use a table or chart

Organising the information into a table, tally or chart can make it easier to see if you have the possible solutions, help you find any patterns and makes your working out clear.

E.g How many multiples of 6 are there between 10 and 65?

There are 9 multiples of 6 between 10 and 65

Number	Multiple	Answer	No
6	2	12	1
	3	18	2
	4	24	3
	5	30	4
	6	36	5
	7	42	6
	8	48	7
	9	54	8
	10	60	9

Make an organised list

Creating a list is normally used when there is a greater amount of information available. It requires the information to be set out in a more systematic fashion so that the probable solutions can be clearly seen. Students need to follow a procedure or sequence to ensure all possibilities are listed and to prevent repetition.

E.g. How many different combinations can you make using the numbers 1 2 3 4

1234	2134	3124	4123
1243	2143	3142	4132
1324	2314	3214	4213
1342	2341	3241	4231
1423	2413	3412	4312
1432	2431	3421	4321

Guess and check

Guess and check requires you to begin with an educated guess (as opposed to a wild guess!).The initial guess should be made after reading all the information of the question. Then check the guess against the information in the problem, and if it is not a correct solution, try again, take note if your answer was too big or too small. Keep trying until a solution is found.

E.g. Alana is five years older than Saul. Alana's age plus Saul's age totals 25.What are their ages?

Guess	Alana's age	Saul's age	Total
1	10	5	15
2	17	12	29
3	15	10	25✓

Some descriptions come from "Problem Solving" by Sharon Shapiro Black Education

Look for a pattern

Mathematical patterns can be found everywhere—in nature, numbers and in shapes. You can use probability and predictions to discover patterns. When a pattern is established, it is easy to predict what comes next.
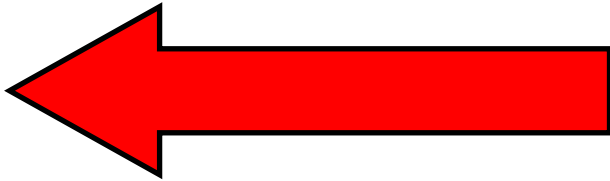
E.g. What are the next three numbers in this pattern

6 9 8 11 10 __   __   __
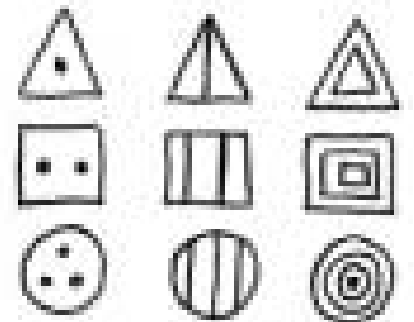
To get from 6 to 9 you add 3, but it's not the same for the next number, from 9 to 8 you take away 1. From 8 to 11 you add 3. Then from 11 to 10 you take away 1. I can see a pattern, +3, -1 so the next three numbers are 13, 12, 15

Work backwards

When working backwards, you start with the answer and use the information in the question to step backwards. This is a good strategy to use for problems like The Hidden Number.

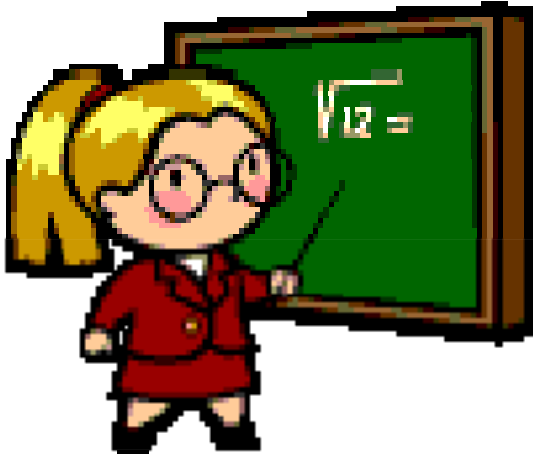E.g. Imagine there is a number hidden under this circle.
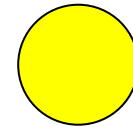
If I double the hidden number and add 3, the total is 15.
Can you work out what the hidden number is?

15 – 3 = 12
Half of 12 is 6
The hidden number is 6

Some descriptions come from "Problem Solving" by Sharon Shapiro Black Education

Make it simpler

Identify what you want to know and break the problem into smaller steps or change the numbers to smaller ones. Solve each step and work out a final solution and check with the question to see if it makes sense.

E.g. How many sides altogether are there on 80 triangles and 15 squares?

There are 3 sides on a triangle, if I work out 3 x 8 = 24 then times 24 by 10 that is 240.
There are 4 sides on a square. I can break the 15 into 10 and 5.
4 x 10 = 40 and 4 x 5 = 20, so that's 60. 240 + 60 = 300
So there are 300 sides on 80 triangles and 15 squares.