Organised
Lists

Making An Organised List

**To be a good problem solver you
must learn to organise your work.**

1   How many three digit numbers can you make using the digits 1 , 2 and 3 ?

Copy and complete   **1 2 3**   **2 1 3**   . . .

                                  1 3 2   . . .   . . .

2   List **all** the three digit numbers you can make using the digits 4 , 6 and 9.
Write your answer as an organised list.

3   List **all** the four digit numbers you can make using the digits 1 , 2 , 3 and 4.
Copy and complete

1 2 3 4   2 1 3 4
1 2 4 3   2 1 4 3
1 3 2 4   **and so on**
1 3 4 2
1 4 2 3
1 4 3 2

4   List **all** the four digit numbers you can make using the digits 4 , 6 , 8 and 9.
Write your answer as an organised list.

5   List **all** the different orders you can make using the letters A , B and C.
Write your answer as an organised list.

6   List **all** the different orders you can make
using the letters P , Q , R and S.
Write your answer as an organised list.

7   Mel sits in the front row of the cinema with her three pals Tom ,
Joe and Glen. In how many different ways could they be seated ?
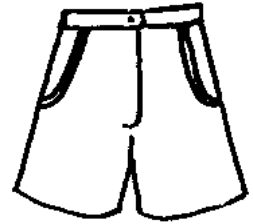
M T J G
M T G J
M J T G and so on.

Colourful Clothes

Jack rummages about in his wardrobe to find some clothes to wear.
He finds 2 jerseys, one blue and one red.
He finds 2 pairs of shorts, one blue and one white.
He finds 2 caps, one orange and one yellow.

The table below shows one possible combination.

R = RED , W = WHITE , B = BLUE , O = ORANGE, Y = YELLOW

JERSEY	R							
SHORTS	W							
CAP	Y							

Copy and complete the table to show all the possible combinations.
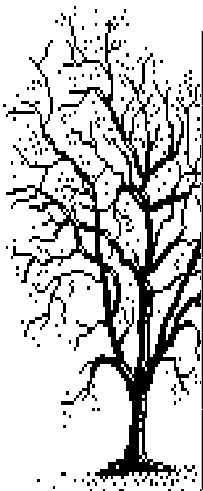
Tricky Tree Trunks

Jess has been told by the head gardener to plant four trees in a row:
a willow, an elm, an ash and an oak.
Jess decides to see how many different ways she could plant the trees.
Copy and complete the organised list.

W = WILLOW , E = ELM , A = ASH , O = OAK

W E A O	E W A O	A W E O	O W E A
W E O A	E W O A		
W A E O			
W A O E			
W O E A			
W O A E			

Holiday Treat

A class of first year students at Kirkwall Grammar School
take part in a holiday survey.
They are asked to choose from the list below the **three** most important things
in a holiday and put them in order, starting wth the most important.

sunshine
disco
good food
sandy beach

Use an organised table to
find all the possible answers.

# Zoom Zoom

Des has forgotten his car registration number.
He knows it begins with V.
He remembers that the V is followed by three
digits and ends with three letters.
He remembers that the digits are 1 , 2 and 3
but cannot remember the order.
He remembers that the letters are A , B and C
but cannot remember the order.

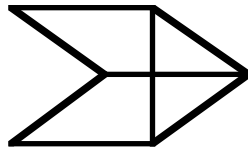Make an organised list of all the possible registration numbers.

V 1 2 3 A B C	V 1 3 2 A B C
V 1 2 3 A C B	V 1 3 2 A C B
V 1 2 3 B A C	V 1 3 2 B A C
V 1 2 3 B C A	V 1 3 2 B C A
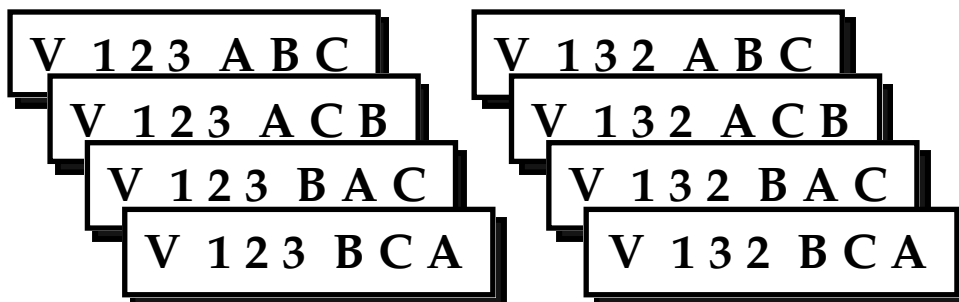
Darts

A darts team is designing a badge for its members.
There are four sections for the enamel.
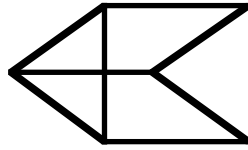
A   How many possible designs are there for the badge if there
are only up to <u>two</u> different colours of enamel used ?

B   How many possible designs are there for the badge if there
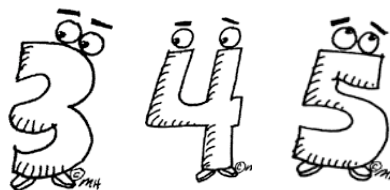are only up to <u>three</u> different colours of enamel used ?
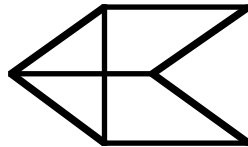
C   How many possible designs are there for the badge if there
are only up to <u>four</u> different colours of enamel used ?

Morse

How many different sequences can you make with three dots and two dashes ?
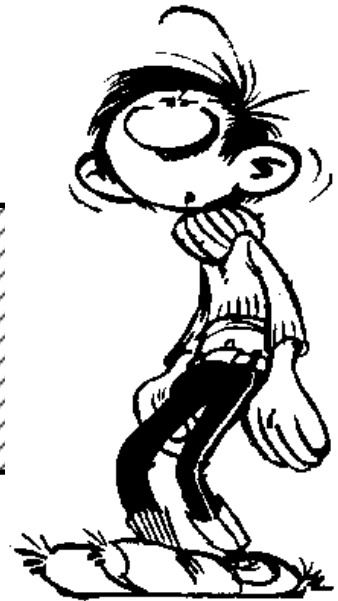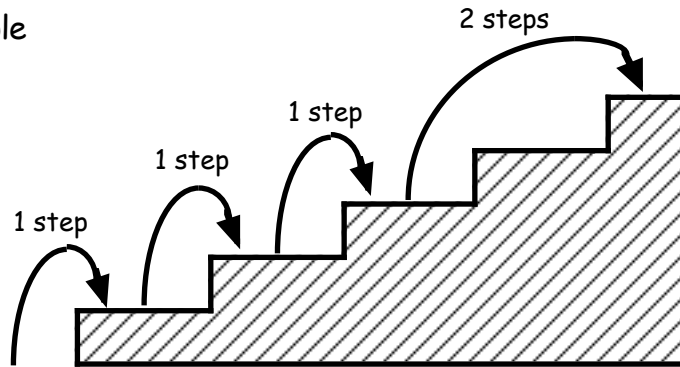
● ━ ● ━ ●

Numbers 'R' Us

How many different three digit numbers can be made with the
digits 3 , 4 and 5 if you can use the same digit more than once ?

Making & Using Oranised Lists

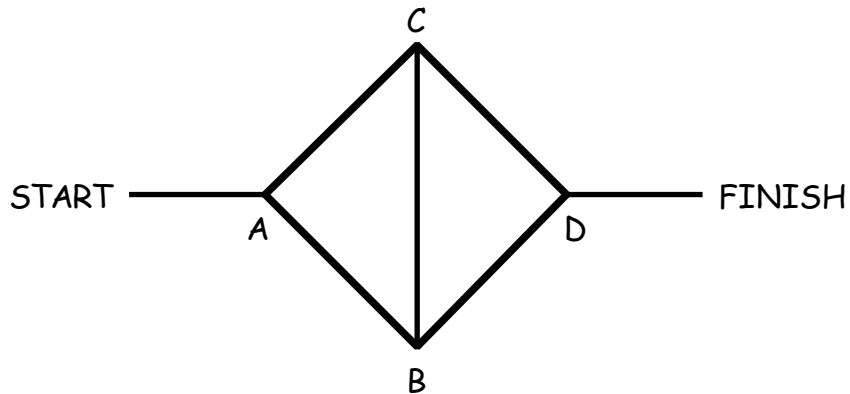In these questions make organised lists to find the possibilities.

1   Jaz can go up stairs one or two at a time.
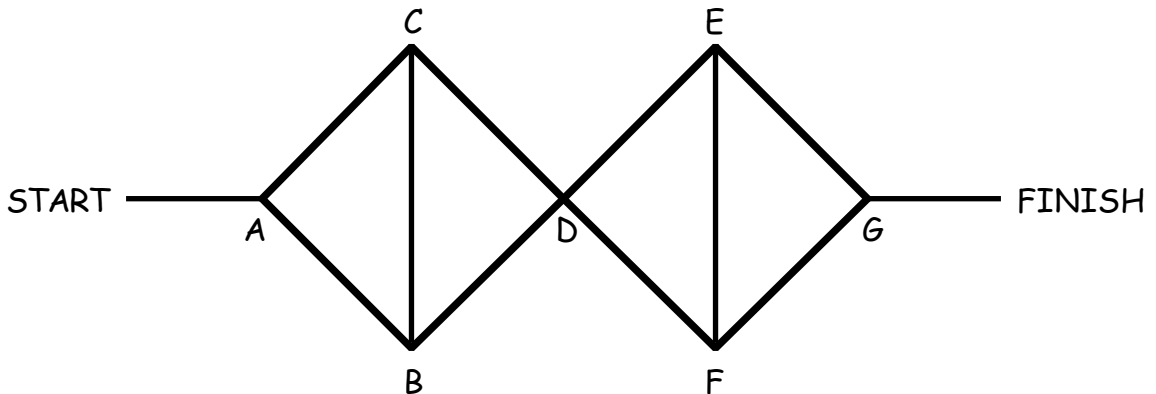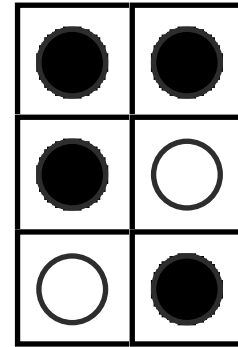How many different way can he climb 5 steps ?

Example

2 steps

1 step

1 step

1 step

1 step

Note: 1 2 1 1 is not the same as 1 1 2 1

2   a)   How many paths are there from start to finish ? List them.

C

START ——— FINISH
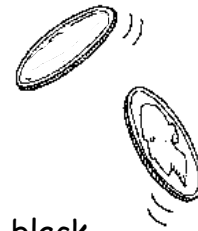
A   D

B

      b)   How many paths are there from start to finish ? List them.

C   E
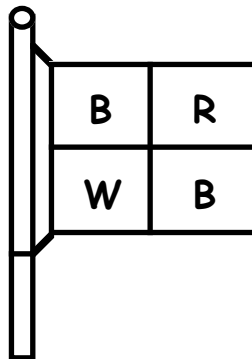
START ——— FINISH

A   D   G

B   F

3   How many different arrangements
    are there for four black discs and
    two white ones in this grid ?

4   How many different ways could you make a total
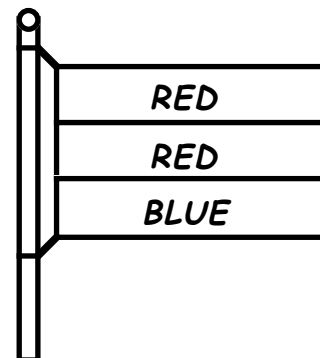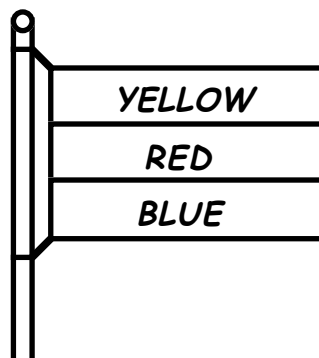   of 50p using only other silver coins ?

5   Jake is designing a flag with one red, one white and two black
    squares. How many different flags could he make ?

B	R
W	B

6   Millie is designing a flag with three
    horizontal strips of material.

    a)   If only two different colours of
         material are available, how many
         different flags could she make ?

    RED
    RED
    BLUE

    YELLOW
    RED
    BLUE

    b)   If three different colours
         of material are available,
         how many different flags
         could she make ?

7   A money box is opened by using a two digit code number.
     Only the digits 1 , 2 , 3 , 4 , 5 and 6 can be used.
     The pointers are set at the digits in the code and the buttons pressed.

     The code for this money box is 24.

     PRESS   1 2 3 4 5 6   1 2 3 4 5 6   PRESS
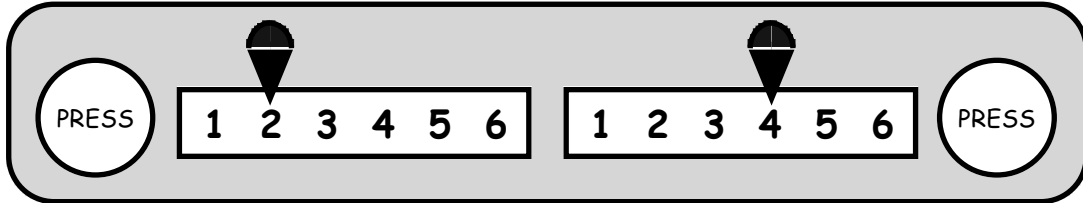
     a)   Write down all the possible codes.

     b)   The code for a money box is a number whose digits add up to 7.
           What numbers would you try to open the box ?

     c)   Find a valid code which is an odd number greater than 40.

     d)   Find a valid code which is a multiple of three.

8   The area of a rectangle is 144 cm^2. The rectangle
     has sides that are a whole number of centimeters.

     List all the possible rectangles by
     giving their length and breadth.   18 cm

     Example   8 cm by 18 cm

     Note: An 18 cm by 8 cm rectangle is considered
                  to be the same as an 8 cm by 18 cm rectangle.   8 cm
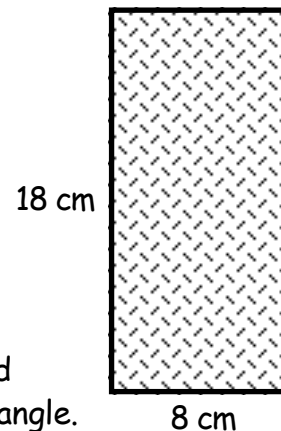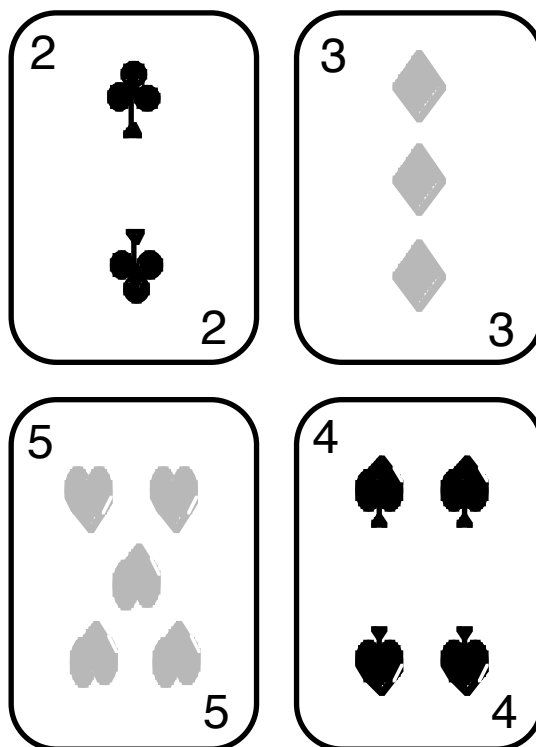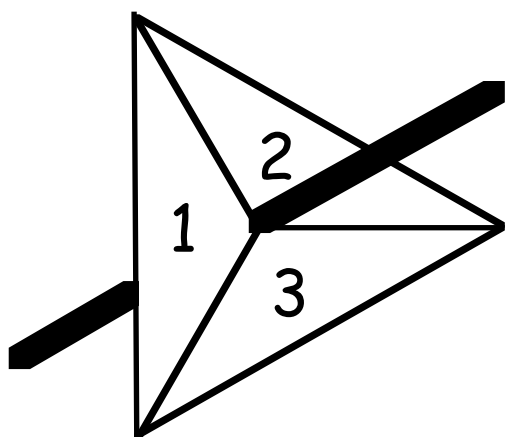

9   Teams in a league score points as follows:
     3 points for winning a match,
     1 point for a draw and
     0 points for   losing the match.

     A particular team gains 24 points in 12 matches.
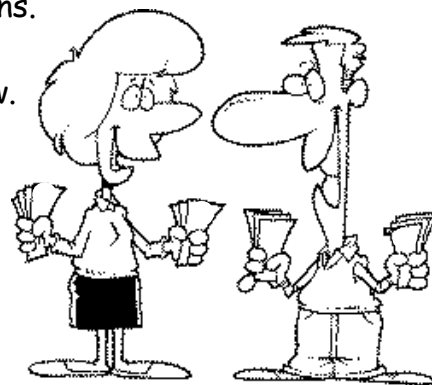   What is the least number of matches they could have won ?

10   If you spin the spinner for a
      tens digit and pick one of the
      cards for the units digit,
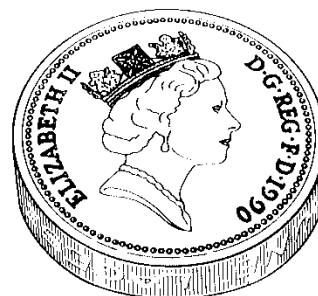   how many different numbers
      can you make ?

      Make a list.

11   I want to exchange a 50p for other silver coins.
      How many different ways could this be done ?
      Suggestion - complete the organised list below.

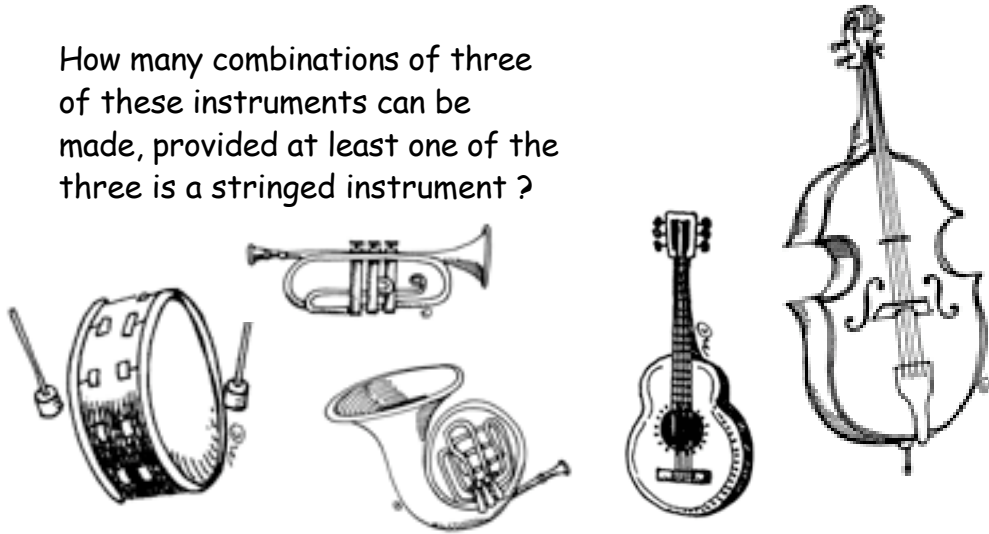| 20 p	10 p	5 p
2	1	
2	0	

'I prefer folding money.'

12   I have 50 pences , 20 pences and 10 pences.

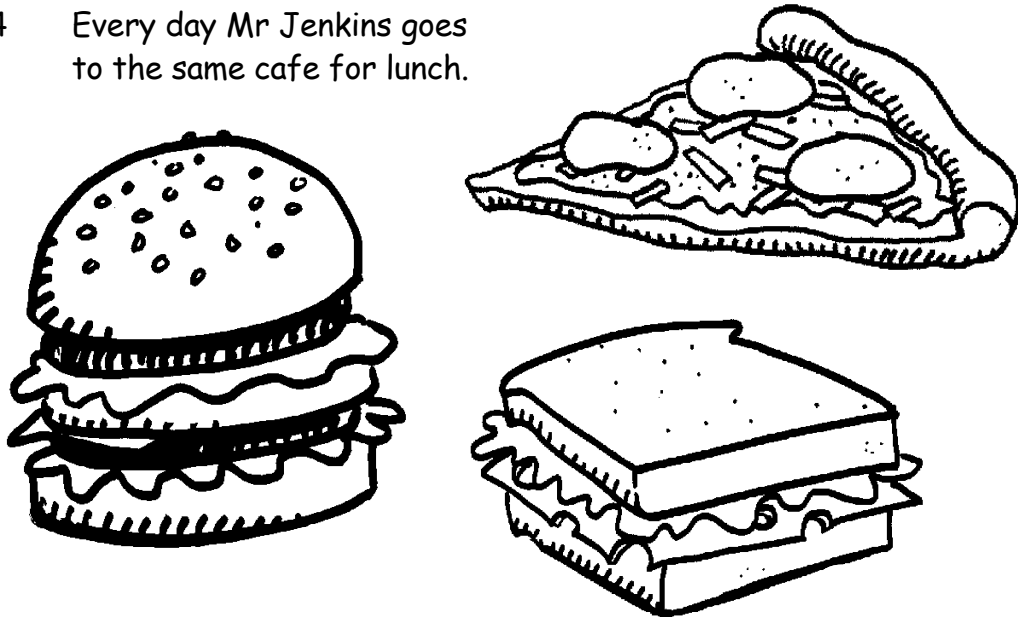   How many different ways could
      I make a total of £1 ?

13   Mrs Kettle has five musical instruments: a guitar, a drum, a cello, a French horn and a trumpet.

How many combinations of three of these instruments can be made, provided at least one of the three is a stringed instrument ?

14   Every day Mr Jenkins goes to the same cafe for lunch.

The menu is very limited.
There are only pizzas, burgers or cheese sandwiches to eat and only tea or coffee to drink.

Mr Jenkins always has one thing to eat and one thing to drink.

How many days can he go without having the exact same thing for lunch ?