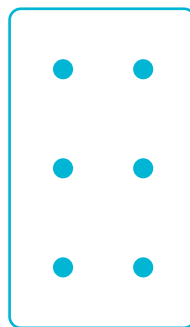


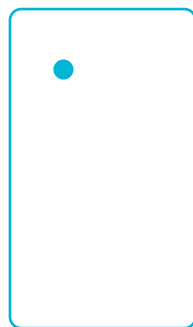
Braille

Louis Braille - a French educator and inventor in the 19th century - invented an alphabet for use by blind people.

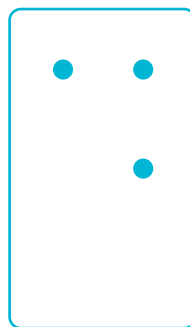
The alphabet consisted of raised dots in rectangular patterns. Each pattern of dots was based on a 3 x 2 rectangle.



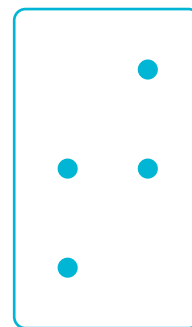
Some patterns are given below:



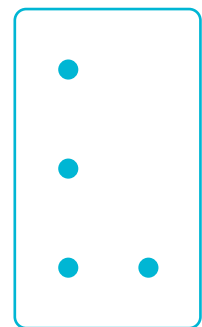
A



D



T



V

How many different patterns can be made using this system?

Consecutive Product

The product of three consecutive numbers is 504.

What are the three numbers?

The numbers are: __, __, & __

Make up some more calculations by multiplying three consecutive numbers together then give someone else your products for them to work out what your three starting numbers were.

Algebra and Addition

I'm thinking of three consecutive numbers, a , b and c which are all less than 10.

When I add $a + b + b + c + a + c$ the answer is 42.

What were my numbers?

$a =$

$b =$

$c =$

42

12 345 679

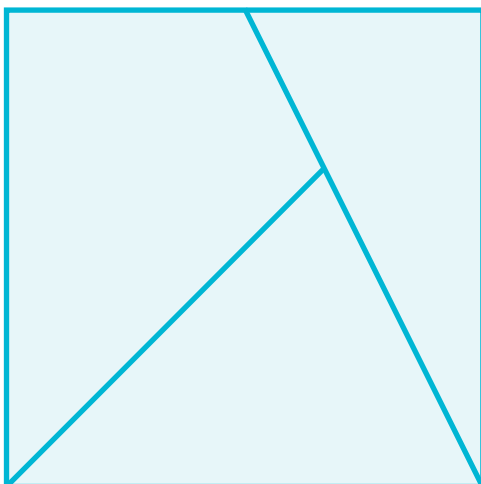
Ask a volunteer to write down the number twelve million, three hundred and forty-five thousand, six hundred and seventy-nine (12 345 679).

Next have your volunteer circle any digit in the number.

Now ask your volunteer to multiply 12 345 679 by a number you provide.

The number you suggest should be a multiple of nine. For example, if 3 is circled you should ask the volunteer to multiply by 27 (3×9). Your volunteer will no doubt be surprised by the result.

Shape Shifter



Cut along the lines to make 3 pieces.

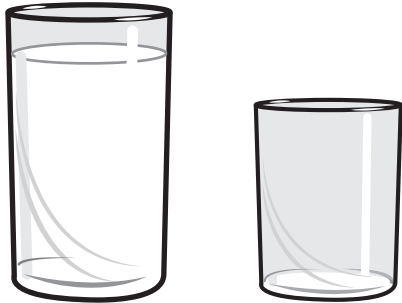
How many different shapes can you make by rearranging the pieces?

Try to make a triangle with all three pieces, or with the two larger pieces.

Try to make a parallelogram or a pentagon using all three pieces.

You Need Glasses

I have been told that if you measure the circumference of most glasses, it will be higher than the height of the glass.



Is this usually true?

Three Counters

Here are three counters.

A number is written on the top of each. There is also a number (not necessarily the same) written on the reverse of each counter.



Throwing the counters in the air and then adding the numbers on the face-up side, the following totals were produced:

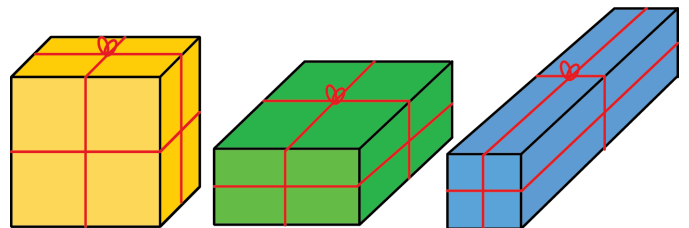
16, 17, 18, 19, 20, 21, 22, 23

Try to work out what numbers are written on the reverse side of each counter.

Wrapping Presents

How much paper and ribbon do you need to wrap a present?

Each of these presents is made using eight cubes. They're then wrapped and tied with red ribbon.



Which parcel needs the least amount of paper?

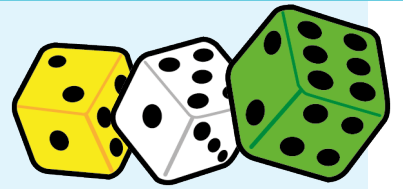
Which parcel needs the least amount of string?

Now try different parcels made up of 36 cubes.

Different Dice

Roll three dice.

If two or more dice show the same value, roll these dice again, repeating until all three dice show different values.



What is the average number of throws needed to get all the dice showing different values?

Try four dice, five dice, six dice or seven.

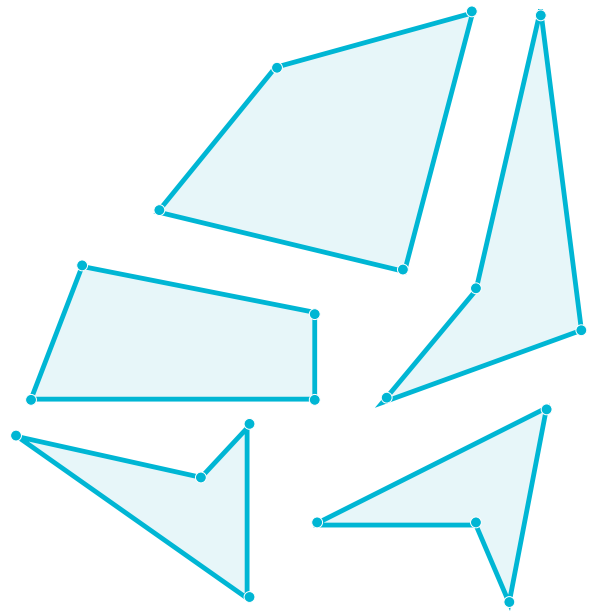
Quadrilateral Quest

A quadrilateral is a four-sided polygon.

Connect the midpoints of the sides of each quadrilateral.

What kind of figure do you get in each case?

What happens if you connect the midpoints of the adjacent sides of each of the new shapes?



Answers

Braille

64

Algebra and Addition

6, 7, 8

You Need Glasses

Yes, usually.

Three Counters

The backs of the counters in order are 5, 9, and 4.

Quadrilateral Quest

Connecting the mid-points gives a quadrilateral.
Connecting the mid-points of the new shape also gives a quadrilateral.

Consecutive Product

7, 8, 9

Shape Shifter

14 different shapes using all 3 pieces.
Triangle with 3 shapes, triangle with 2 shapes, parallelogram & pentagon shapes.

Different Dice

50 is the average number of throws needed to get 3 different values.

Wrapping Presents

The yellow parcel needs the least of both paper & string.

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