



CATERHAM  
SCHOOL

## Maths Activities January 2021

### Objective

To provide opportunities for pupils in key stage 2, particularly Year 6, to develop their reasoning and problem solving skills through Mathematics. To increase confidence in their mathematical skills, improve willingness to fail and persist with tricky problems and to generally be enthused about Mathematics.

### Methodology

A set of 10 resource packs aimed at developing higher order maths skills, suitable for pupils with high prior attainment in Maths. The pack contains activities that can be drawn on as extension tasks or discreet lessons. A Caterham teacher will visit schools to coach groups of students through alternative and 'smart' approaches to the problems in the pack.

### Resources

**Speed test x 1:** The purpose of the speed test is to make pupils familiar with the idea that they will not, and cannot, complete all of the questions and expect to get them right. Instead, a target of 3 or 4 correct should be seen as a victory. Pupils can set themselves realistic targets knowing that the likelihood of failure is high but that the process of developing ideas and approaching problems in a creative way is important. Use of *intuition* is important here.

**Sudoku x 3:** Designed to draw out mathematical reasoning skills including *logical thinking* and *rigour*, these puzzles provide excellent grounding for success in Mathematics.

**Short activities x 5:** These activities promote a range of skills including mathematical intuition along with tenacity and bravery to attempt unusual problems.

### Maths Crossword x 1

# Maths Activities

January 2021

Dear Mathematicians

## Instructions

Hello! This pack of maths activities is designed to stretch and challenge. When attempting the activities do not worry about getting it all right, or worry if you find it hard – be brave and do what you can.

You can write on the laminated sheets but be sure to write your final answer on the paper provided so we can talk through your answers at some point.

The *method* (how you get the answer) is **just** as important as the actual answer so try to show your reasoning clearly.

Your teachers have a copy of my answers so you check yours. I may have made a mistake or two so if you are really sure that I have, be ready to explain the correct answer when I come in.

I love fun maths problems, so if you come across any that you particularly like, please pop it into this wallet to show me at a later date.

Hope you enjoy these activities!

Mrs Griffiths

**Sarah Griffiths**  
**Deputy Head (Pastoral & Wellbeing)**  
**Caterham School**  
**@CatsWellbeing**



UNITED KINGDOM MATHEMATICS TRUST

## Speed Test

- Time allowed is 20 minutes.
- There are 20 questions to try to answer in the time allowed.
- You will not get all of these right! Two or three correct answers would be great!
- You will need to prioritise, choosing questions that you like the look of.

### Question 1

What is the value of:  $100 \times 5 + 100 \div 5$  ?

### Question 2

The mean of four whole numbers is 40. What is the sum of the four numbers?

### Question 3

In a class of 25 pupils, 44% have a pet. How many pupils in the class do not have a pet?

### Question 4

The time shown by my 24-hour digital clock is now 11:55. What time will it show in 75 minutes time?

### Question 5

What is  $\frac{1}{3} - \frac{1}{4} + \frac{1}{5}$  expressed in the simplest form?

### Question 6

What is the value of  $\frac{2+4+6+8+10}{1+2+3+4+5}$  ?

### Question 7

What is the value of  $1^3 + 5^3 + 3^3$  ?

### Question 8

It is 12 miles from Stockton to Darlington by train. A train does this journey at an average speed of 40 miles per hour.

How many minutes does this train take to do the journey?

### Question 9

What is the value of 5% of 20 plus 10% of 10 plus 20% of 5?

### Question 10

In the shop, bananas cost 24p each. Hattie buys 3 bananas and pays with a £2 coin.

How much change should Hattie receive?

**Question 11**

How many hours are there in 365 days?

**Question 12**

How many prime numbers are there that are between 90 and 100?

**Question 13**

What is the value of  $10 + 9 \times 8 - 7 \times 6 + 5 \times 4 - 3 \times 2 + 1 \times 0$ ?

**Question 14**

On Monday the shop charges £150 for a computer. Before opening on Tuesday, it increases all its prices by 20%. Before opening on Wednesday, it reduces all its prices by 20%.

How much does the computer cost on Wednesday?

**Question 15**

Two friends, Fatiha and Georgina each have a pile of marbles. If Fatiha gave Georgina 1 marble, both friends would have the same number of marbles. If Georgina gave Fatiha 1 marble, then Fatiha would have twice the number of marbles as Georgina.

How many marbles do the friends have in total?

**Question 16**

Kyra has 9 cards with a different digit on each card. The sum of the digits on the cards is 43. Which digit is not on one of the cards?

**Question 17**

The number 2019 is the product of two prime numbers. What is the larger of these two prime numbers?

**Question 18**

How many triangular numbers are there which are less than 100?

**Question 19**

What is the smallest whole number which is divisible by 1, 2, 3, 4, 5, 6, 7, 8 and 9?

**Question 20**

In a video game, Zenda has to cut off all the monster's heads to defeat it. Whenever 3 of the monster's heads are cut off, a new head immediately grows. Zenda defeated the monster by cutting off 14 heads in total.

How many heads did the monster have to begin with?

# Sudoku I

## Sudoku Rules

- Each **row** should contain all of the digits from 1 to 6.
- Each **column** should contain all of the digits from 1 to 6.
- Each **block** should contain all of the digits from 1 to 6.

					4
	2		3		
			5		
4				6	3
					1
	1	5			

Hint: Start with '4s' and get one in each box  
then '5s'  
then '6s'

## Sudoku 2

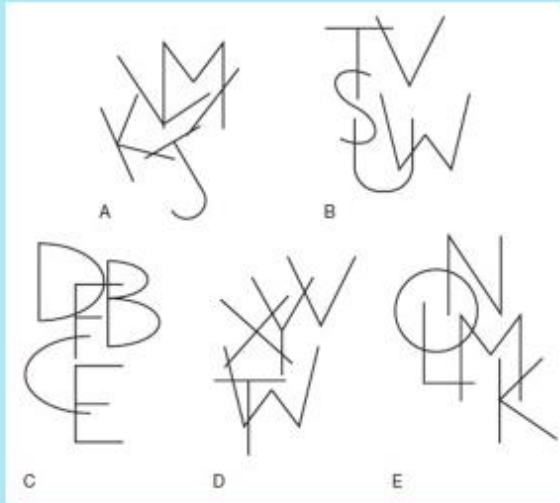
### Sudoku Rules

- Each **row** should contain all of the digits from 1 to 9.
- Each **column** should contain all of the digits from 1 to 9.
- Each **block** should contain all of the digits from 1 to 9.

	6			7	2			1
8			1	3	6	5		
		3	4					
2			6	5			3	
		6			7		1	
			2			8	6	4
9		7		8	4			
		8			9		7	
			7	2	1		8	3



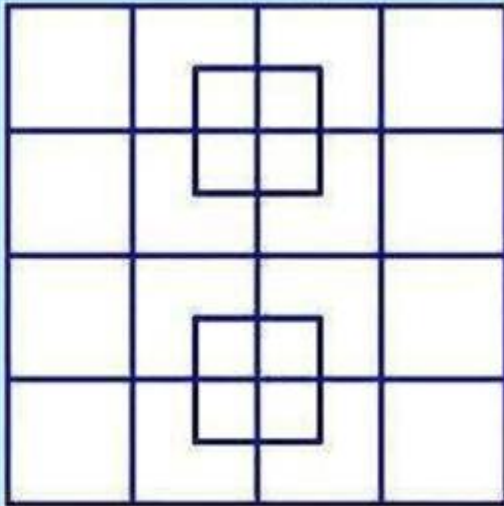
## Activity 1



**Which is the  
odd one out?**



## Activity 2



How many  
squares?

### Activity 3

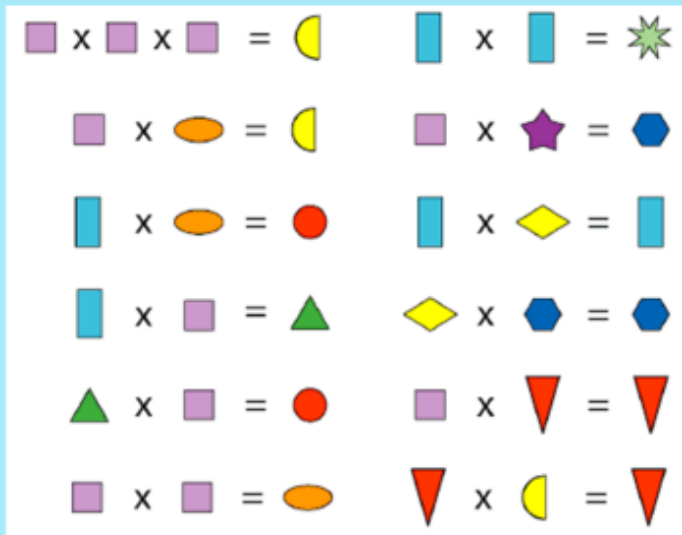
1	5	1	5	1	5
3	3	2	3	3	4
2	3	4	4	3	2
2	2	3	2	2	4
2	2	4	3	4	2
4	4	4	4	2	3

Starting with any number on the top row, make your way to the bottom, adding the numbers as you go.

Each time you go to the next row, you can move straight down, or one place to the left or right.

What is the highest total you can make? What is the lowest?

## Activity 4



Each shape has a different value.

You can only use the numbers 0-12.

## Activity 5

A scientist gathered four maths students. They were then lined up so that each one could see the one in front of them but not behind them. Each had a hat placed on their head.

So the student in the back could see the hats of the three students in front, but the student in front could not see any hats.

*"There is a red hat, a white hat, a blue hat, and a hat that is a duplicate of one of those colours,"* the scientist said.

Starting with the one in the back, each student was asked what colour hat they were wearing. They all gave the correct answer!

What was the arrangement of the hats that made this possible?

## Maths Crossword

1		2		3		4		5
		6						
7						8	9	
			10		11			
12	13				14			
			15	16				
17		18				19		20
				21				
22						23		

### Across

- The largest square number less than 21 across.
- 4 down + 6 across – 21 across.
- 4 down + 21 across minus 41.
- The last 3 digits of 3 down but in a different order.
- 13 down + 52.
- 1 plus 14 across – 16 down.
- 16 down + 400 – 8 across.
- 35 squared + 10.
- A palindrome.
- One seventh of 9 down + 21 across.
- Half of (5 times 10 down) + 4.
- The number of minutes from 10:30 until 14:45.
- 4 down + 272.
- 3 down – 7 across – 13 down.

### Down

- One fifth of 14 across.
- 95 + 10 across + twice 4 down.
- The result of taking 575 away from 2 down + 5 times 9 down.
- The number of days in 16 weeks.
- 19 down – 1 across.
- A cube number.
- $2 \times 3 \times 37$ .
- The same as 15 across.
- The total number of degrees in three angles of any triangle.
- The first cube number with 4 digits + 2 dozen.
- 17 across plus one ninth of 2 down.
- The square number which is four times another 3 digit square number.
- One third of 3 down.
- A square number.