Maths Week 2020

Maths Week at Laurance Haines is different to how we had planned. However, this week we have tried to put together some fun maths activities that you can enjoy from home or school. There are also some extra challenges for KS1 and KS2 on codes and coding. We know you will be great code breakers! Remember to email and tweet your teachers or @MrsMartinLHS using #mathsLHS with photos and show off any work you have done – there are house points to be won! Use the recording sheet attached to collect your points.

Dress up in something with a number on **5 points**	Go on a number hunt – how many different numbers can you take pictures of around your home and neighbourhood? **2 points per number**	Bake some cupcakes – can you show how to cut them into halves, thirds and quarters? **8 points**	Human numbers – how many different numbers can you represent with your body? **10 points (double points for teamwork!)**
Choose four toys and lay them out from **longest** to **shortest**. Use a ruler or tape measure to measure their actual length – were you right? **8 points**	How many different things can you do in 1 minute? e.g. how many times can you write your own name? Say the 3x tables? How many star jumps? **3 points per activity**	Go on a shape hunt – how many different 2D and 3D shapes can you find around the house and your neighbourhood? **2 points per shape**	Raid a food cupboard – order the food from **lightest** to **heaviest** **6 points**
Traffic survey: watch a road for 30 minutes (**from a safe place with an adult**). Can you **tally** how many cars go past? What about buses, vans, motorbikes, bicycles? Now can you draw a **graph** to show your results? **Bar chart: 10 points** **Pie chart: 20 points**	One million pounds! Assume you have £1 000 000 to spend or give away. Plan what you would do with it, down to the very last penny. Research the price of things using the internet. **10 points**	Use a variety of envelopes that come through your letterbox. Estimate both the **area** and **perimeter** of each envelope to the nearest centimetre by writing on the back. Measure them accurately using a ruler or draw 1cm squares to see how close your estimate was to the actual perimeter and area. **10 points**	Keep a record of how long you watch TV for each day for this week. ♦ Work out the **total** watching time for the week. ♦ Work out the **average** watching time for a day (that is, the total time divided by 7). **8 points**
Go on a **symmetry** hunt. How many symmetrical objects can you find in your home and neighbourhood? **2 points per object**	Make a **pattern** Use anything you like (paints/crayons/stones/leaves) to make a pattern and describe it e.g. my pattern goes stick, pebble, stone, stick, pebble, stone... **6 points**	Go on an **array** hunt. An array is an arrangement of objects in rows and columns. How many can you find? e.g. **3 points per array**	Find a recipe for 4 people and rewrite it for 8 people. **6 points** Can you rewrite it for 3 people? Or 5 people? **10 points**

Cracking codes! KS2

Here are some extra challenges for KS2 based on codes and code-breaking – don't forget to show off what you have done by emailing your teachers or tweeting your activities
@MrsMartinLHS #mathsLHS

A brief history of cryptography

Cryptography is the use of codes and ciphers to keep information secret. There are records showing cryptography has been used for thousands of years.

Historically, cryptography methods primarily involved the use of pen and paper encryption or simple mechanical aids. For example, clay tablets found in Mesopotamia dating from 1500 BC had an encrypted recipe for pottery glaze, and Hebrew scholars were using substitution ciphers as far back as 500 or 600 BC.

In modern times, the ability to send encrypted messages has been of vital importance during war efforts. For example, during World War II.

Challenge 1:
Research project: Who was Alan Turing?

Research the famous mathematician Alan Turing. What was he famous for?

Present your findings in anyway you like – you could choose to make a poster, a powerpoint presentation, or a booklet! Submit your work to your class teachers by emailing them with photos of your work.

Challenge 2:
Caesar shift code

Julius Caesar used a simple substitution cipher to send messages to his troops. He used a very simple rule to replace each letter with another letter from the alphabet. He substituted each letter by the letter that was 3 places further along in the alphabet, so that "a" was replaced with "D", "b" with "E" and so on

Although Caesar substituted each letter with the letter 3 places ahead, there are other variations of this cipher. You could shift each letter by 4 or 5 or 6 etc. This is called a key, and depending on which key you use, you will get a different message.

A Caeser Shift wheel can help you to create your own codes, and decipher codes with different keys. Create a coding wheel by using the attached template.
1) Cut it out (or copy and draw your own circles using something round, like a plate)
2) Write the alphabet in CAPITALS around the large circle
3) Write the alphabet in lower case around the smaller circle
4) Fasten the two together using a clip, or a piece of string, making sure the small one is inside the large one

It works by matching "a" on the inner wheel to the appropriate shift letter
on the outer wheel: so for a shift of 3, "a" would be lined up with "D".

Now using your wheel, try to translate this message:

ZKHQ BRX KDYH GHFRGHG WKLV ZRUN RXW WZHQWB VHYHQ WLPHV QLQH DQG WHOO BRXU WHDFKHU

Tip – to figure out how many places the wheel has moved, pick a three letter word and try common three letter words such as THE, AND, HAS and USE

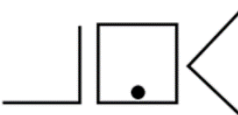Email your teachers when you have the answer!

Challenge 3:
Pigpen Cipher

The pigpen cipher is a substitution where letters are converted into symbols consisting of fragments of a grid with and without dots. The pigpen cipher has been used by many groups throughout history. For example, during the American Civil War, pigpen cipher was used by prisoners to communicate with each other.

To make a pigpen cipher, a 'pigpen' is drawn out like these. A letter of the alphabet is written inside each pen. To make the pens different, dots are used.
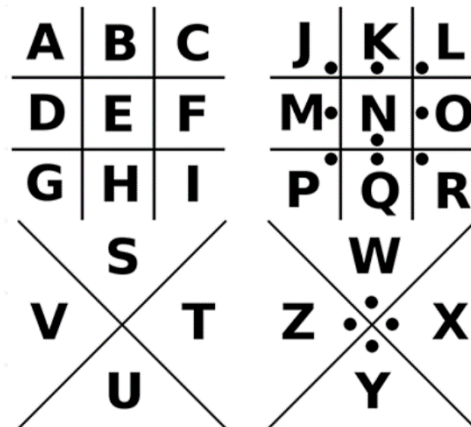
Once you have assigned every letter of the alphabet to a pen, you can now write in code. For example:

Can you...
1) Write your name using the pigpen cipher?
2) Write the name of your favourite food?
3) Write the name of your favourite animal?

Email your teachers with the answers and see if they can decode them!

Challenge 4:
Design your own code!

You might want to research these types of codes for more inspiration:
- Morse code
- Vigenere square
- Transposition cipher

Using what you have learnt about all these codes can you design your own code?

Caesar Wheel Template

Score Card

My school house is _____

Activity	Points available for this activity	Do I need to double my points or multiply by the number of things I found?	Have I sent evidence to a teacher?	Final score for this activity
Array hunt	3 for each array	Yes x5	Yes - tweet	3x5=15