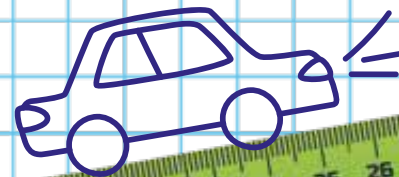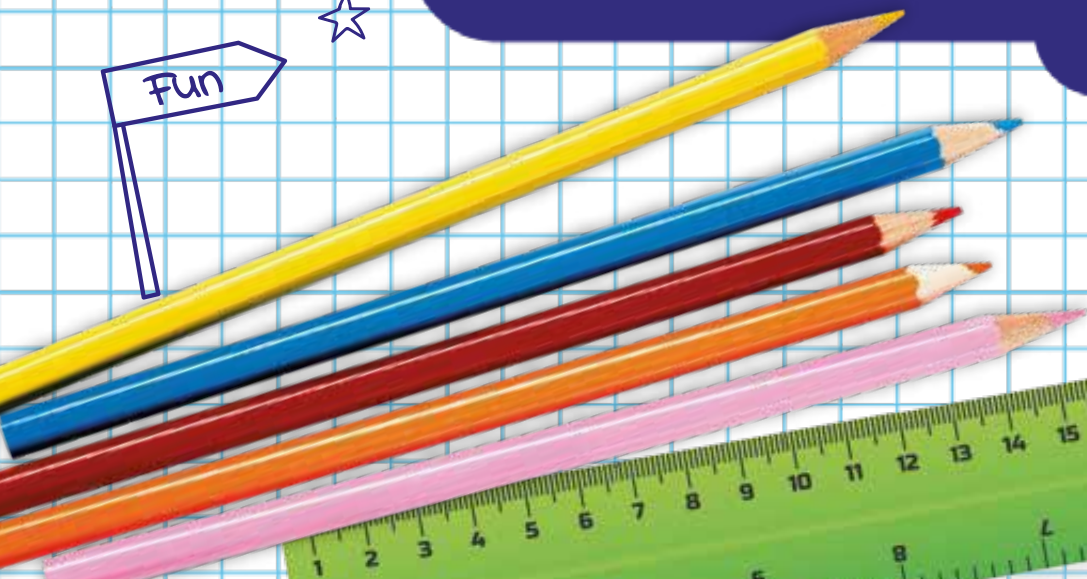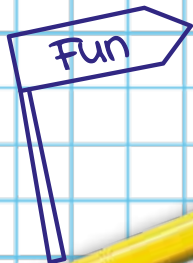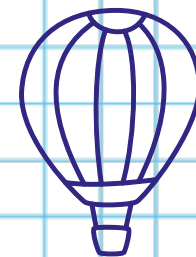# Magical Maths

A selection of ideas for having fun with maths.
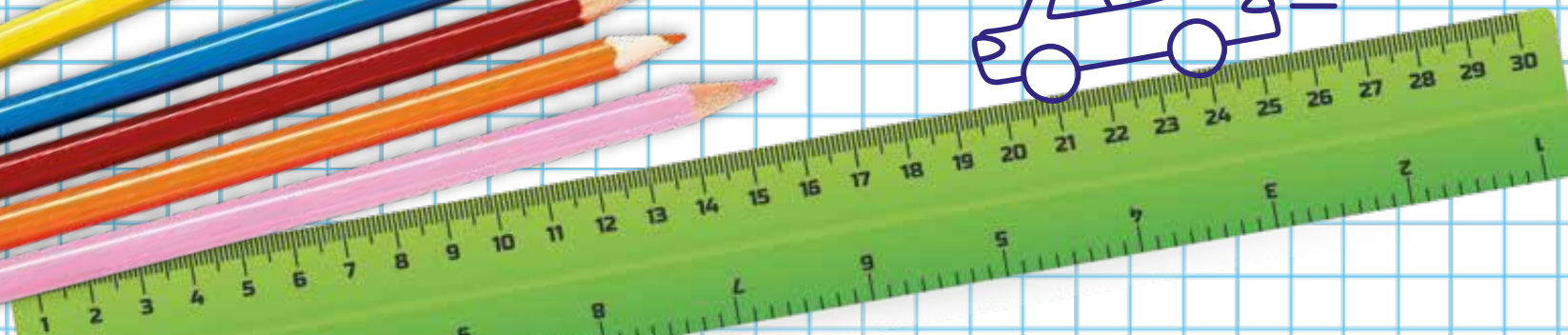
The Story of Plentiful

Not long ago, but very far away, there was a great city called Plentiful. Many people lived in Plentiful and as its name suggests they had plenty of everything. Beautiful houses, clothes, food, and possessions were easy to come by. Nobody went hungry and every resident had everything necessary for a very comfortable existence.

In a humble dwelling in the centre of this great city lived a very famous wizard magician. Among other things, she had created magical trees which were always full of food of every kind imaginable. She had brought peace and prosperity to the town and everyone had thanked her.

The people were proud of their city and worked very hard to make it great. Plentiful became incredibly prosperous and everyone who lived there could be called 'rich'. The town had inventions that were not yet seen anywhere else in the world – computers, phones, cars, robots, teleporters and many other things.

Because of all these things that were so easily available, the people started to forget just how lucky they were. They gradually became more and more greedy, always wanting more than the next person.

The wizard warned them to think carefully about what they were doing.

Many had robots, televisions, and screens in every single room of their very large houses and a different car for each day of the week.

People were not satisfied with just one birthday a year and wanted more and more.

1

2

"I am eight years, seven months and five days old today. Give me my presents!"

The wizard warned them once again to put a stop to their greedy ways.

Instead of being content and happy with everything they had, the people of Plentiful became just the opposite – they were miserable. Nothing seemed fun anymore when it was like Christmas every day. People became obsessed with counting how many possessions they owned and bragging about it with their friends.

3

The wizard gave a third warning, but the citizens of this very lucky town could not stop themselves from becoming more and more greedy.
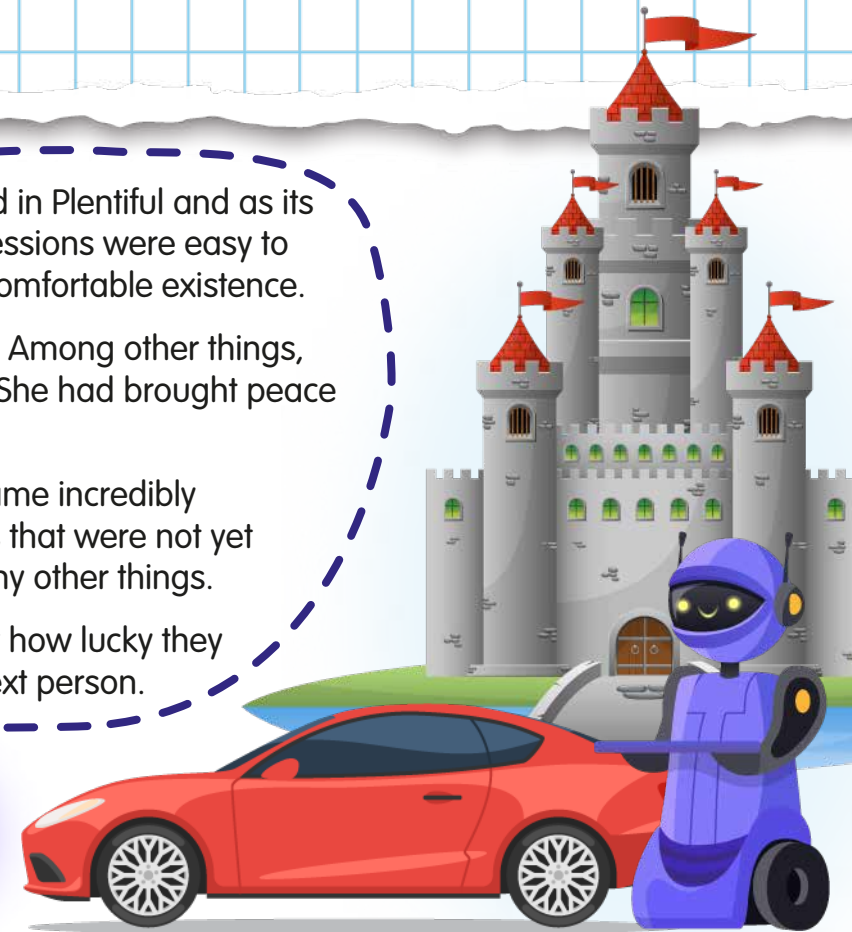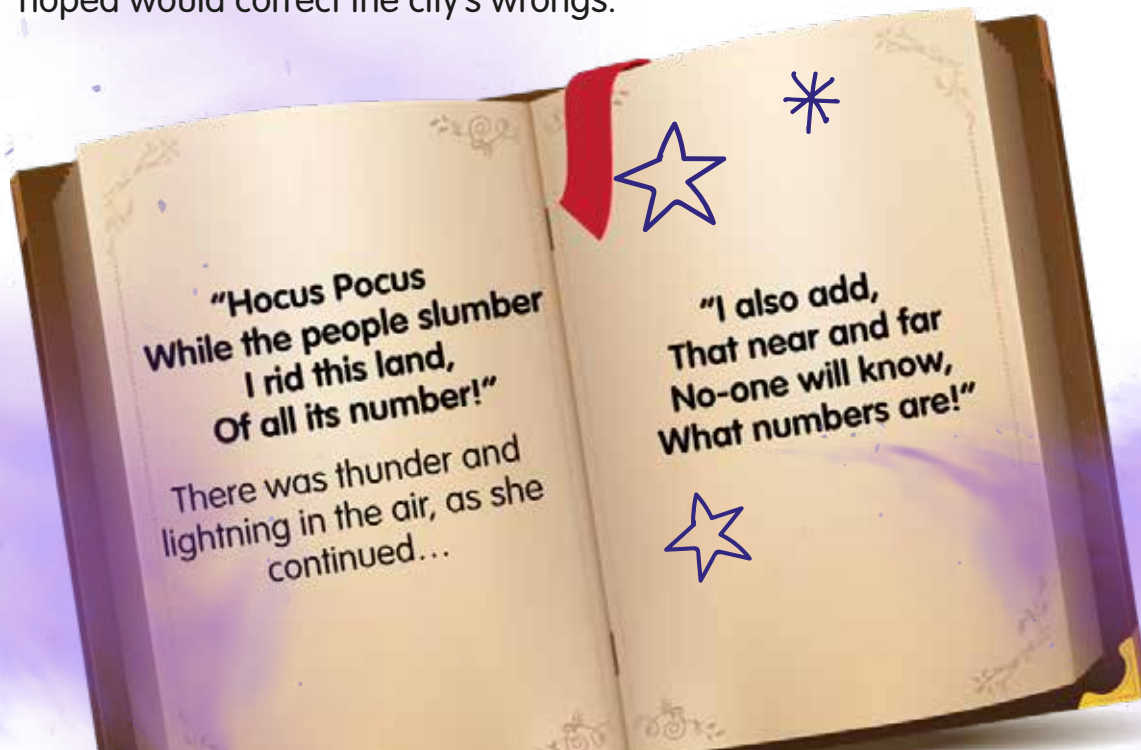
The Story of Plentiful

From her small house, the wizard watched, dismayed, as the city became completely selfish. She watched from her window and saw people lumbering around with their arms full of as much as they could carry, trying to compete with their neighbours.

They sold the food from the magic tree to other towns but made the prices so high that eventually nobody else could afford it. The people of Plentiful did not seem to mind that others were suffering for their luxuries. It had grown to be a horrible place full of grasping, greedy people.

One day the magician rose from her couch and went into her work room where her books of spells were kept. She searched all day and night for the best spell to bring the people to their senses and make them see how awful they had become.

Finally, just as the moon crept above the houses and peered down like a giant eye upon the sleeping city, the wizard found the perfect spell she had been searching for. Climbing to the roof of her house, with her golden cloak flowing behind, she uttered the words she hoped would correct the city's wrongs:

The next day was chaos. People woke up at all the wrong times because no alarms had gone off and if you or I could have seen the city's clocks and watches, we would have noticed that there were no numbers on the faces.

"Hocus Pocus
While the people slumber
I rid this land,
Of all its number!"

There was thunder and lightning in the air, as she continued…

"I also add,
That near and far
No-one will know,
What numbers are!"

The next day…

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The Story of Plentiful

"What time is it?" People cried, but none could answer.

"Am I late for school?" asked the children.

"Is it time to go to work?" asked the adults.

Nobody knew.
Some tried to use their phones, but the buttons were blank.
Most people stayed at home, but those who did go out found more problems…
They argued about how long they had been at work:

"I've been here since that red car passed ages ago," said one woman.

"No, you haven't," said someone else. **"I've been here longer than you and I never saw a red car."**

But no one could know for sure and they were only guessing.

Things went from bad to worse.

Food had no prices, amounts or weights. Bank accounts and of course cash machines could not be used.

Computers would not work.

Birthdays could not be celebrated, nor any other special times in the year because all the calendars were blank.

There were no letters delivered because there was no way of knowing which houses to send them to.

Food was burned in ovens; no one knowing how long it had been in for or at what temperature.

Eventually, people forgot how to play games. Without being able to count, how could they tell how many points had been scored, how many places to move or how many people in a team?

Mr Smith,
Somewhere on Oxford Rd,
Plentiful

AIR MAIL AIR MAIL AIR MAIL AIR MAIL AIR MAIL AIR MAIL AIR MAIL

JANUARY ????
S M T W T F S

The Story of Plentiful

Life became very difficult. The days went by – only the magician knew how many, until one day, at an unknown time somebody suggested, **"Perhaps the wizard could help?"**

She was waiting at her door when a crowd of people approached.

"Please help us!" The crowd implored. Something is wrong, something is missing from our lives and we are in a mess!"

The magician smiled. **"Yes, something is missing,"** she said, "I took numbers away from you."

The crowd looked confused as they did not know what numbers were.

"You were so busy counting your possessions," the wizard continued, **"That you didn't care about anything else. I warned you several times to stop your greedy ways, but you would not listen."**
The people hung their heads. **"We are truly sorry"**, a spokesperson said, **"We can see now what you warned us about. People from our neighbouring towns have shunned us too. We want to be better."**
Everybody agreed.

The wizard was happy. It seemed the people had seen the error of their ways.
**"In that case I will return the numbers to your lives.
Be sure to calculate your mistakes and make amends."**

She counted to five. All at once, there was the wonderful sound of clocks chiming and bells ringing. It was five o'clock – teatime!

Everyone cheered and a great party was prepared.
People came from miles around to eat and receive all kinds of gifts from the houses of the Plentiful people.

From that day onwards, the citizens realised how happy they could be when they shared their things. They were grateful for everything they had and never again wanted to face a life without numbers.

**"Hocus, Pocus,
I call the thunder,
To bring back to this land,
All its number.

I also add,
That near and far
All will know,
What numbers are."**

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The Story of Plentiful- Activities!

Here are a few questions and ideas:

- Where is the story set?
- What does **'plentiful'** mean?
- What makes the city in the story different to where you live?
- Why did the people become so greedy?
- Would you like it to be like Christmas or your birthday every day?
- What sort of things would you like to grow on a magical food tree?
- Draw your own magical tree.
- Illustrate one scene from the story.
- Have a talk with a partner and make a list of ways in which you use numbers in everyday life.
- What would be the worst problem in a world without numbers?
- Are there any ways in which the world would be better without numbers?
- Do you have a favourite number? If so, why?
- Are numbers as important as words?
- Get together and share your ideas as a class or larger group.
- Use your own ideas (as well as any you like from the story) to write your own story, or perhaps a play, on a similar theme.

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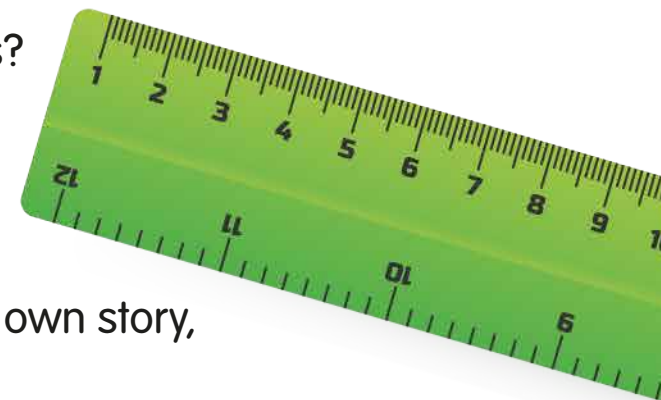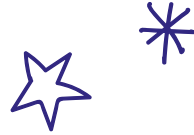
Did You Know?

Mathematics can be fascinating and magical. Discuss and explore these interesting examples.

The idea of **numbers** and **counting** goes back a long way in history. Some historians suggest that humans were counting as far back as **50,000 YEARS AGO!**

FOUR is the only number that is spelt with the same number of letters as its value (4).

There are lots of different languages used around the world. **See if you can learn to count to 10 in a different language.**

9 is known as the **MAGIC NUMBER**. If you multiply a number by 9 and add together the digits of the answer until you get a single digit number, this will always be 9. For example: 11 x 9 = 99, 9+9 = 18, so 1+8 = 9.

Have a go yourself …

If you add two even numbers together, the answer will also be even!

What happens when you add two odd numbers together?

FORTY is the only number that is spelt with letters arranged in **alphabetical order**.

Take a look at this **MAGICAL** calculation …

111 x 111 = 12321

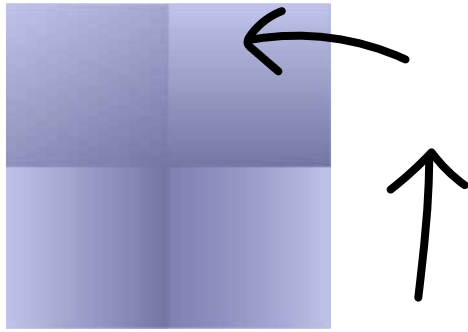The numbers on opposite sides of a dice always add up to seven.

12 + 3 - 4 + 5 + 67 + 8 + 9 = 100
Can you find another calculation to make the answer 100 using the numerals 1 to 9 in order?
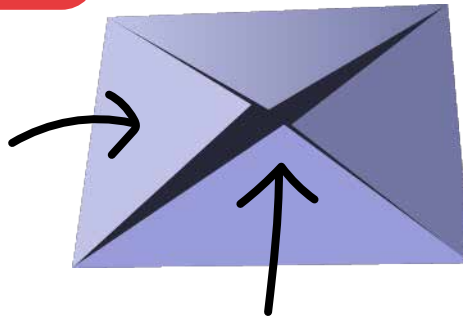
Origami Boxes

Origami boxes are simple, useful, fun to make and can involve a great deal of mathematical thinking - All you need is a square of paper – no scissors or glue required!
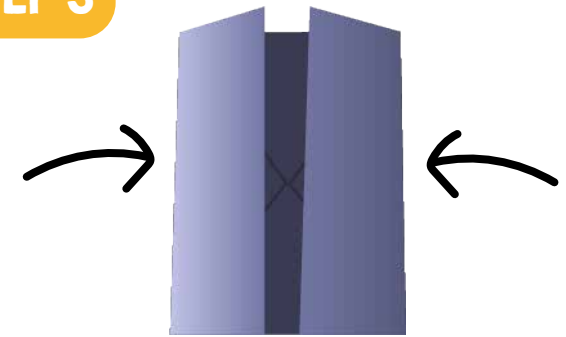
STEP 1

Fold the bottom line to the top and crease. Turn, and fold bottom to top again. Unfold to see 4 squares.
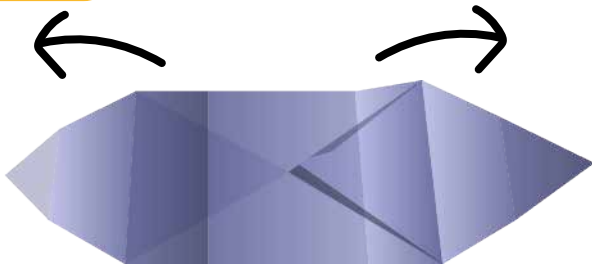
STEP 2

Fold each of the 4 corners to the centre.
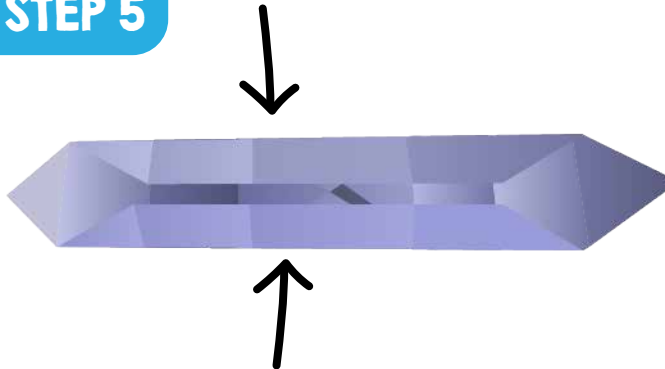
STEP 3

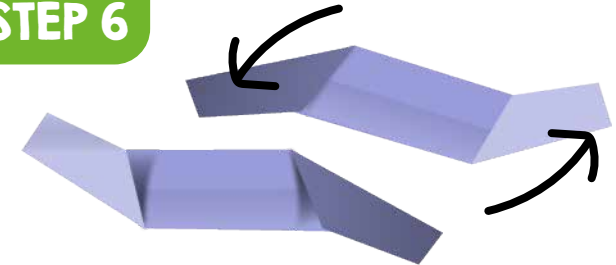Fold both sides of the paper to the centre.

STEP 4

Unfold back to the square, then open the left and right sides.

STEP 5

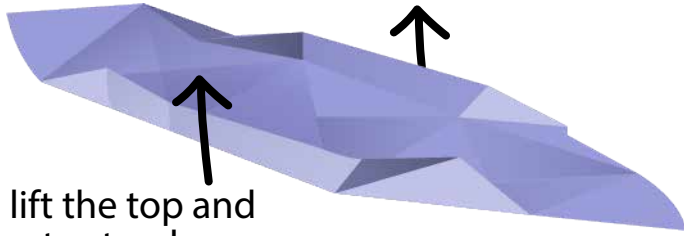Fold the top and bottom sides to meet in the middle.

STEP 6

Following the creases already there, fold the left side up and the right side down. Now fold the left side down and the right side up. Unfold back to look like Step 5.
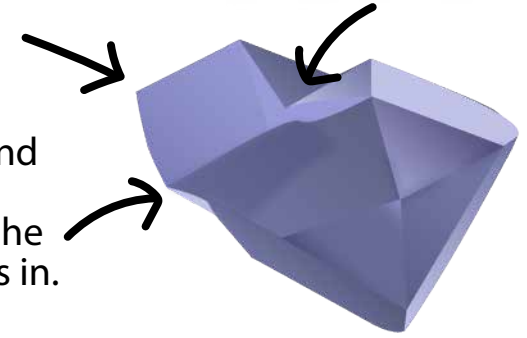
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Origami Boxes

STEP 7

Unfold and lift the top and bottom sides to stand up (like the sides of a box).

STEP 8

Lift the right side end up and pull forward, placing the triangle on the bottom of the box whilst folding the sides in. Repeat on the left side.

Mathematical Thinking

- What shapes can you see as you make the box?
- What shapes can you see in the finished item?
- How much will fit in your box? Estimate and find out using different items.
- Measure the length, width, and height of your box.
- Work out the area of the base.
- What is the surface area of your box?
- What is the volume?
- Make a lid for your box.
- Make a nest of three boxes, fitting neatly inside one another.
- If the paper were double the size, how would it affect the volume? Investigate to find out.
- Try using different types of paper, e.g. squared, wrapping paper, paper with your own designs.
- Use rice to compare capacities of different sized boxes.
- Work out the ratio – original square of paper: box.
  Will the ratio remain the same whatever the size?
  Work out the size of paper needed to make a box of 20/ 12/ 100cm^2.
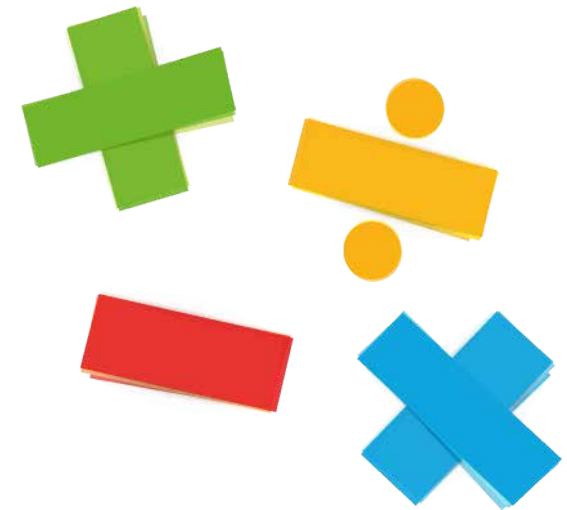
Game For a Challenge?

Design and make your own original maths themed game

1. **Decide on what type of game you want to make.**
This could be a board game with questions, a card game,
or a physical game. You could use one of your favourites
for inspiration. Think about whether it will be for one player,
two players or more.

2. **Choose the area of maths that you will include and how it will work in your game.**
Try to include an area of maths that you have been learning about, such as numbers,
calculations, fractions, decimals, shapes, or measures.

3. **Draw your design.** Plan out your game and decide on the resources you will need to
create it. You might also like to create a theme, such as sport, space or animals!

4. **Make your game**. Collect or make all of the resources that your players will need.

5. **Every great game needs some instructions**. Create a set of instructions for how to play
your game. You could include number of players, aim of the game, step by step
instructions, and how you can win!

6. **When your game is ready, set it up and try it out!**
You could challenge family or friends to have a go too.

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Brain Teasers

Have some fun with these brain teasers and problems ...

If all of the whole numbers from 0 to 100 were arranged alphabetically, which number would come first? Which number would come last?

I am an odd number. Take away one letter and I become even.

What number am I?

Think of a number.

Double it.

Add 10.

Halve it.

Take away your original number.

Your answer is … 5!

Can you explain how this works?

Try exploring what happens if you change the number that you add.

Can you move just 3 coins to flip this triangle upside down?

Move one matchstick to make this calculation correct.

5 + 3 = 6

You have a birthday cake. You must cut it into 8 equal parts by only making 3 cuts. How do you do it?

You could try this out using playdough or why not use a real cake!

I add five to nine, and get two. The answer is correct, but how?