STEM challenge

Magnet Maze

Use any of the materials provided to make a magnet maze, be creative! Can you change or adapt your magnet maze to make it easier or more difficult?

STEM challenge

Can you make raisins dance?

1. Pour some still water into a cup.
2. Add some raisins and observe.
3. Pour some soda water into a cup.
4. Add some raisings and observe.
5. What was the difference between the two reactions? Why do you think this was?

STEM challenge

Cable Car

Can you make a cable car? You'll need a door for passengers to get in and a window for them to see out of. Attach a straw or tube to the top of the cable car. Feed string through the straw/tube then secure the string to something stable. By positioning one end of the string higher than the other, the cable car can travel downhill.

STEM challenge

Toothpick Tower

Can you make a tall tower using toothpicks and playdough? Measure your tower, is there any way you could make it taller?

STEM challenge

Can you make a mini foosball table?

1. Cut a rectangle as the 'goal' at either end of the box. Ensure they are the same size at either end, and big enough for the ball to fit in!
2. Decorate the box as a football pitch.
3. Draw your players on card, or you may wish to use Jelly babies or small toys. Think about what size they need to be to fit in the box.
4. Measure what height you will need the skewers to be, then pierce the skewer through one side of the box, and out the other side, make sure it is level.
5. Cover the pointed ends of the skewers to help prevent injury. You could use two different colours of plasticine, one for each team.
6. Attach your players to skewers, ensuring there's an equal number of players on each team! Think about how many can fit in your box and how you'll position them to ensure the best chance of scoring goals.
7. Use a ping pong ball, marble or other small ball appropriate to the size of your box and players, have fun and see how many goals you can score!

STEM challenge

Can you make a sunlight maze?

1. Cut two pieces of cardboard the width and depth of the shoebox.
2. Cut a hole in each piece, a few centimetre diameter.
3. Tape these pieces into the box to create three compartments.
4. Cut a hole in one end of the shoebox, a few centimetre diameter.
5. Place your sprouting potato/onion in the end without the hole.
6. Replace the lid and position the box on a sunny windowsill, with the hole directed to the sunlight.
7. Check on your potato/onion each day to monitor its progress through the maze. Record the time taken for the shoots to reach out of the box.
8. Did the potato/onion follow the maze to reach the sunlight? Why is it useful for plants to be able to position themselves towards sunlight?

STEM challenge

Can you make a guitar?

1. Use a shoebox, elastic bands, lollypop sticks and a tube to make a guitar.
2. Cut a circle about a third of the way down the shoebox as the sound hole.
3. Draw around the kitchen roll tube in the centre of the side of the shoebox. Then cut out this circle. If you cut the circle slightly smaller than drawn, the tube can fit in without needing glue or tape to hold it in position.
4. Stretch the elastic bands over the box, across the sound hole.
5. Attach a small pile of lollipop sticks, underneath the bands on one side. Now you are ready to make some music!
6. If your elastic bands are not big enough to stretch over the box, attach them across the sound hole using paper fasteners.
7. Investigate whether positioning the bands in different places over the hole makes different sounds. Does the size of the sound hole or the length of the tube affect the sound? What happens if you remove the pile of lollipop sticks?

STEM challenge

Marble Run

Use any of the materials provided to create a marble run, be creative! Can you change or adapt your marble run to make it even longer?

STEM challenge

Build a Car Ramp

Can you make a car with moving wheels using the materials provided? Build a ramp for the car to go down. Measure the distance the car travels. Can you change the angle of the ramp to make the car travel even further? Test your ramp on different textured surfaces.

STEM challenge

Egg Drop

Can you design a contraption using various materials to protect a raw egg from a high fall? Test your contraption outside by holding it up and dropping it. Did the egg crack? Try again from a higher height.

STEM challenge

Build a Boat

Can you make a boat that can float using the materials provided? Measure the maximum weight your boat can hold and still float on the water.

STEM challenge

Build a Bridge

Using the materials provided, can you build a bridge that is strong enough to hold a dictionary? Test it to find out. How could you make your bridge even stronger?

STEM challenge

Build a Water Slide

Use any of the materials provided to build a water slide, be creative! Remember some of the materials will come into contact with water so they will need to be waterproof.

STEM challenge

Build a Dam

You will need a tray, some Lego and playdough. Can you use the materials provided to build a dam that can withhold 750ml of water?

STEM challenge

Wonders of the World

Choose a famous monument e.g. The Eiffel Tower or a wonder of the world e.g. The Great Wall of China and make a model of it using any of the materials provided.

STEM challenge

Build a Habitat

Using the materials provided, build a model of a habitat of your choice. E.g. the rainforest.

STEM challenge

Erupting Volcano!

Build a model of a volcano by attaching a kitchen roll tube vertically, on to a piece of cardboard. Use papier-mâché to build the volcano around the tube then paint it to make it look realistic. When it is dry, add a table spoon of bicarbonate of soda into the tube in the centre of your volcano. Then pour in some vinegar and watch your volcano erupt!

STEM challenge

Make a Zip Line

Using the materials provided, build a zip line for a toy (e.g. a Lego character) to travel from one end of the room to the other.

STEM challenge

Tower of Cards

What is the tallest structure you can build with just one pack of cards? You will need a steady hand! Measure the height of your structure.

STEM challenge

The Tallest Tower

Use various materials outside to build the tallest tower you can. The tower must be safe, not attached to anything and capable of standing freely.

STEM challenge

Paper Plane Competition

See who can make a paper plane fly the furthest. Measure the distance in metres and centimetres. Can you adapt your paper plane design to make it go further?

STEM challenge

Make a Parachute

Using the materials provided, make a parachute for a toy. Time how long it takes for the toy to reach the ground when dropped from a height. Remember that the purpose of a parachute is to slow movement by creating drag, so the slowest is best!

STEM challenge

Christmas Cracker!

Design and make a Christmas cracker. Write and joke to go inside... along with a surprise!

STEM challenge

Make a Catapult

Using lollypop sticks and elastic bands, can you make a catapult to fly a small, light object 1 foot?

STEM challenge

Hoop Gliders

Using paper, a straw and sticky tape, make a hoop glider. See how far it can glide then experiment with how you can change the design to make it glide even further.

STEM challenge

Newspaper Tower!

Using only newspaper and sticky tape, can you make a really tall tower? Your tower must be able to stand by itself. Measure your tower, is there any way you could make it even taller?

STEM challenge

Build a Pyramid

What is the largest pyramid you can make? Measure the width and height of your pyramid.

STEM challenge

Kitchen foil boat!

What is the strongest boat you can make using kitchen foil and no other materials? How much weight can your boat hold before it sinks?

STEM challenge

Christmas Tree

Can you design and build a Christmas tree that will stand up by itself? use a pair of scissors and some card and no other resources.

STEM challenge

Symmetry

Can you create a completely symmetrical snowflake using the materials provided?

STEM challenge

Lego Marble Maze

Can you build a marble maze using Lego? Time yourself to find out how long it takes you to complete the maze. Can you beat your score?

STEM challenge

Can you catch a Leprechaun?

Using the materials provided, can you build a trap to try and catch a leprechaun?

STEM challenge

Drops on a Coin

Using a water dropper, can you count how many drops of water fit on different coins? Record your findings.

STEM challenge

Floatation Device

Can you build a floatation device for an action figure?

STEM challenge

Build an Igloo

Can you build an igloo using the foam peanuts?

STEM challenge

Build a House

Can you build a house using the Teifoc bricks?

STEM challenge

Balloon Powered Car

Can you build a car powered by a balloon. Measure how far your car can go. How could you adapt the design to make it go further?

STEM challenge

Build a Windmill

Can you build a model windmill? The blades must be able to rotate.

STEM challenge

Make a Pinwheel

Using the materials provided, can you follow the YouTube tutorial to make a pinwheel toy?

STEM challenge

Bird Feeder

Using the materials provided, can you build a bird feeder?

STEM challenge

Spaghetti Tower

What is the tallest tower you can build using spaghetti & marshmallows? It must be able to stand up by itself. Measure your tower.

STEM challenge

Newspaper Fort

Can you make a fort big enough to sit inside, using triangles made from rolled up newspaper? Attach the triangles together using sticky tape.

STEM challenge

How Strong is Spaghetti?

Using a packet of spaghetti and polystyrene, test how much weight the spaghetti can hold when it is pushed into the polystyrene vertically.

STEM challenge

Roller Coaster

Build a roller coaster for a ping pong ball to roll down.

STEM challenge

Build a Labyrinth Game

Using a cardboard box, lollypop sticks and a marble, create a labyrinth game. Make sure the holes are cut big enough for the marble to fit through.

STEM challenge

Water Wheel

Can you build a water wheel using waterproof materials? Test your water wheel under pouring water.

STEM challenge

Magnet Powered Car

Can you make a magnet powered car using the materials provided?

STEM challenge

Magic Spinner

Can you use the materials provided to create a magic spinning pen?

STEM challenge

Build a Conveyor Belt

Using the materials provided,
can you build a manually operated
conveyor belt?

STEM challenge

Ball Maze

Can you make a ball maze using a
cardboard box and cardboard tubes?
Colour code or number the tubes and
make up your own rules for the game.

STEM challenge

Spiral Track

Using paper plates and a cardboard tube, can you make a spiral track for marbles to travel down?

STEM challenge

Elevator

Can you build a manually operated elevator using the materials provided? What is the maximum weight it can hold?

STEM

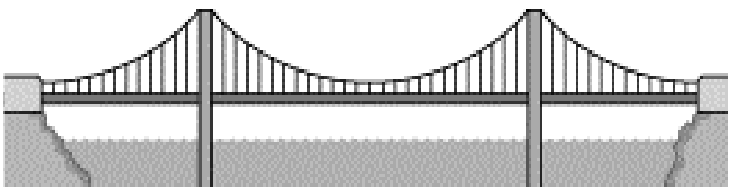
Build a bridge challenge

Can you build a bridge that is strong enough to hold a dictionary?

Illustrate your bridge design in the box

Name the 6 types of bridges:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____



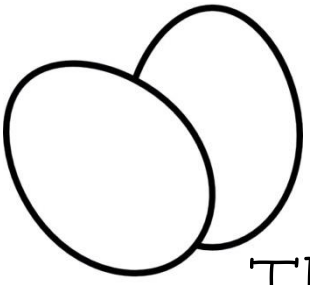
What type of bridge did you design?

_____

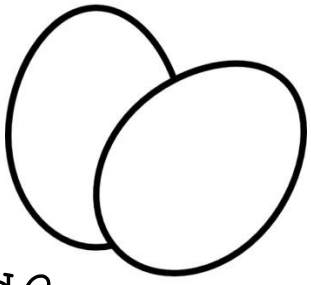
BRIDGES

Sketch the different types of bridges

Beam	Arch
Suspension	Truss
Cable-stay	Cantilever



STEM



The egg drop challenge

Can you design a contraption using various materials to protect a raw egg from a high fall? Test your contraption outside by holding it up high and dropping it. Did the egg crack? Try again from a higher height.

Illustrate your design in the box

Explain why you think your design will protect an egg from breaking:

Drops on a coin STEM challenge

Coin	Number of drops
	
	
	
	

STEM

The car ramp challenge

Can you make a car with moving wheels using the materials provided? Build a ramp for the car to go down. Measure the distance the car travels. Can you change the angle of the ramp to make the car travel even further?

Illustrate your ramp design:

Ramp	Angle of ramp	Distance car travelled
1		
2		
3		

Test your ramp on different textured surfaces. Does the texture of the surface have an effect on the speed the car travels? Explain your answer.