

discover

A school's guide to discovering the TwistED Science Playzone

Introduction

TwistED Science is an award-winning, science-based playzone, jam-packed with interactive play stations.

We aim to promote interest, learning and creativity in science and technology, through creative, imaginative and enjoyable experiences, facilitating futuristic STEM based thinking.

With the emphasis on fun, all our TwistED Science play stations are curated to be hands-on, engaging, high-energy and most of all simple to understand and associate with real-life situations.

As soon as you enter our doors, we want you to switch on your science brains and figure out how our play stations work! We encourage you to touch, engage and explore. Try and get through everything if you can. You may even have a favourite that you'd like to come back to. Our friendly and knowledgeable staff members are more than happy to help you if you have any questions!

Navigating our Playzone

We are unlike any other science exploration space you have been to!

- all our play stations invite interaction and can be enjoyed without the barrier of age or ability.
- instructions are given as a last resort and all play stations are about doing and having fun!
- we encourage you to touch, explore, get hands-on and have a go at everything.
- this is a place where both children and adults can play, learn and connect.

We want your students to turn on their natural **curiosity**, unlock their **creative** spirits and **connect** with the world around them through our exhibits.

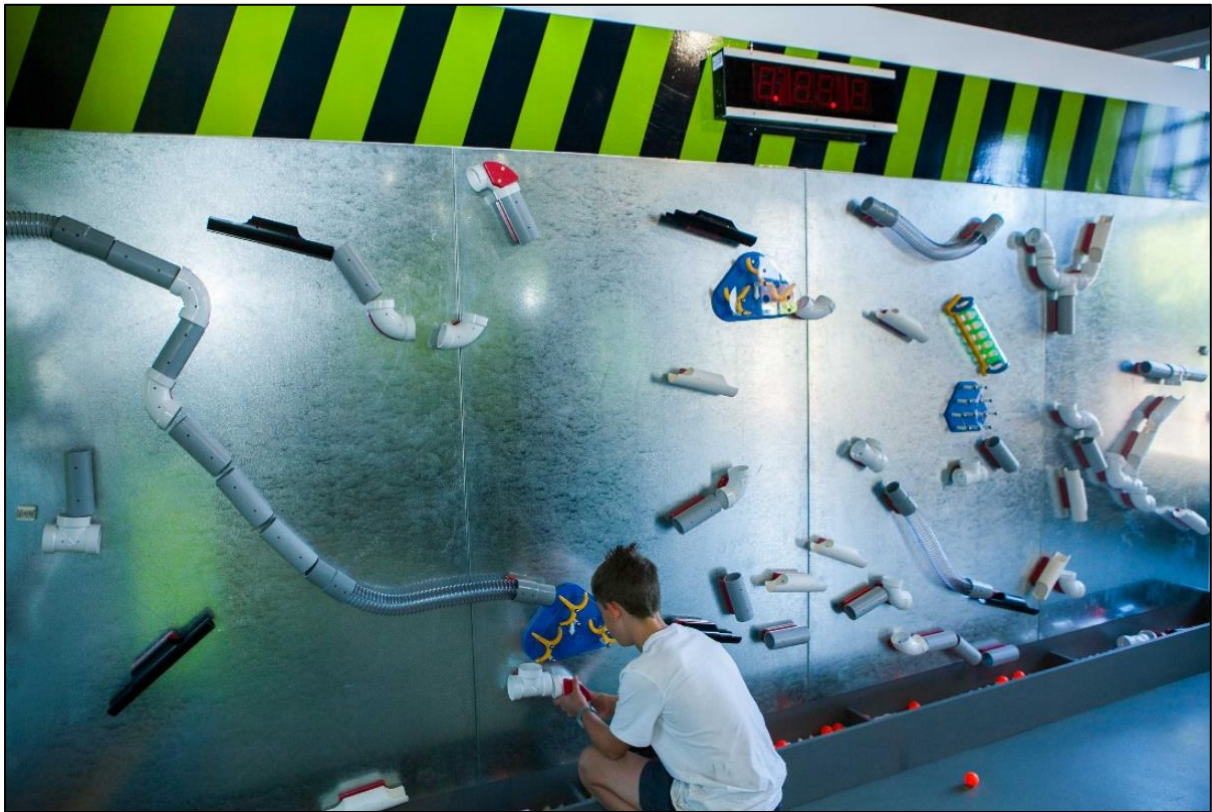
Some things to remember during your time at TwistED:

1. Have fun! Very important 😊
2. Our speed limit in the playzone is "Walking". Please no running for the safety of all.
3. As all our play stations are hands on, please treat them kindly and don't misuse them.

Our Exhibits

Green Zone

gravity



If you lift a ball and drop it, it will fall to the ground. This is because gravity is pulling it to the Earth.

If we put the ball on a ramp it still wants to go straight down, but the ramp is in the way. Gravity is pulling the ball straight down but the ramp forces the ball to go across while it's being pulled down.

challenges

- Use all the different pieces in a run to see what they do and how they work.
- Grab some friends and construct a run that goes for as long as possible. Time your run and record your time. How long did your run go for?
- Make a run that goes for exactly 10 seconds!

construct



Construction applies what we know about Science to build things. Construction uses many different materials.

Are you an architect or a builder?

What's the most interesting building you've seen or visited?

challenges

Create a moving construction.

Can you build something that uses different materials?

With a friend, can you come up with an idea to construct something functional using gears?

bubbles



Did you know that bubbles are made of a thin layer of soapy film surrounding some air. The thin soapy layer is pushed and pulled by air pressure from the inside and outside.

The rainbow colours on a bubble are a map of thickness of the soapy layer. Black is the thinnest. Once you start to see black on your bubble, you know it's going to pop soon!

challenges

Who can make the biggest bubble?

Can you put your head into a bubble?

Can you stick your finger into a bubble without bursting it?

pulleys and balls



Does the net always catch all the balls when they are up in the air?

challenges

Using the pulley, can you make a ball fall outside the net?

Sculpt

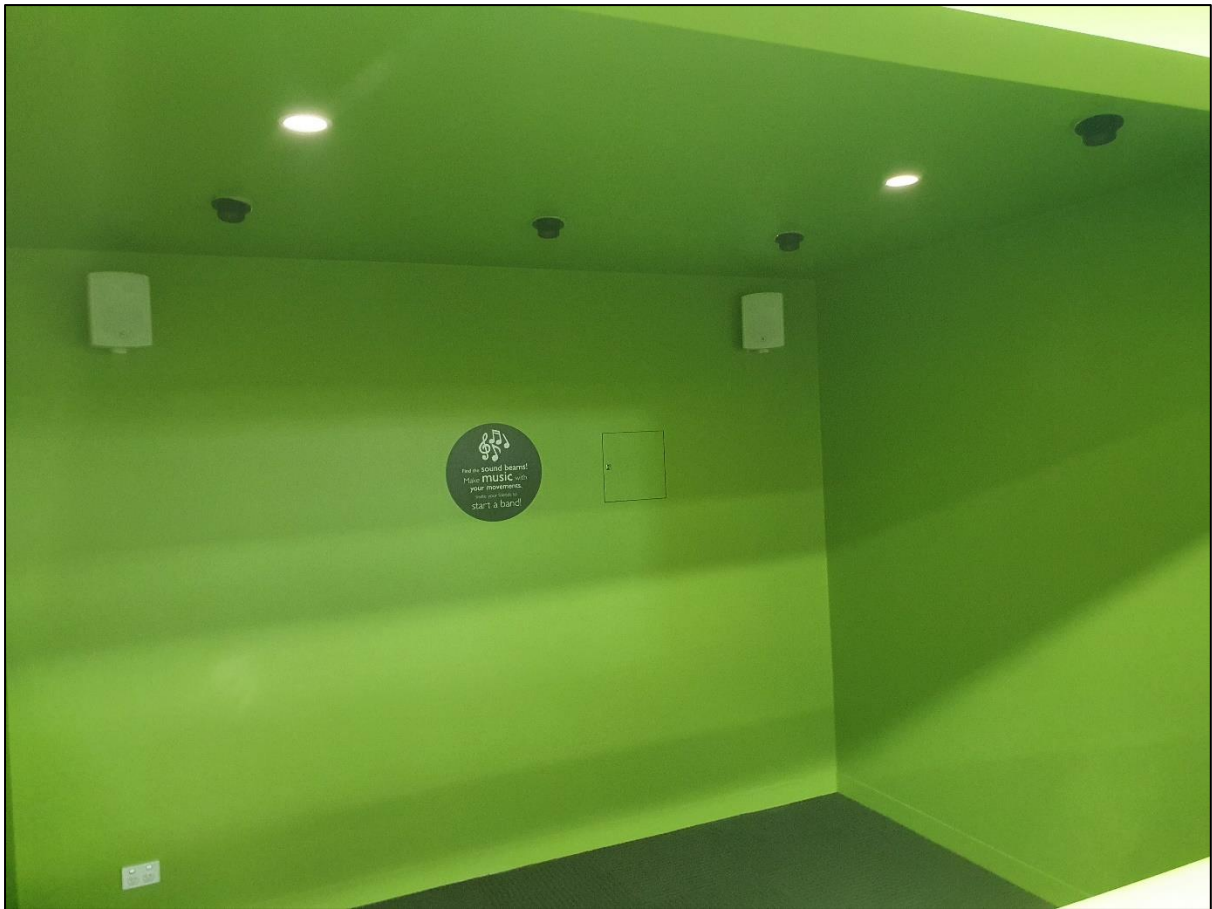


The *Sculpt* play station allows you to visualise features of various terrains and observe natural changes as you build mountains, rivers and valleys.

challenges

- See if you can sculpt a lake or a mountain range!
- Can you make a map of Australia?
- See if you can change how a river runs and observe how the change of direction affects the surrounding environment.

Sound beam



Sound travels through air in the form of vibrations! You can hear things because your ear picks up those vibrations in the air and your brain turns them into sounds.

In the *Sound Beam* play station, there are light beams travelling from the ceiling to the floor! When you interrupt them with your hands, they bounce back to the sensor and it makes a sound, depending on how close your hand is to the sensor. Try moving your hand up and down and notice what happens.

challenges

- Make a song with your friends using classical instruments!
- Can you all get the same note at once?
- See if you can play your favourite song!

recharge



There are many different kinds of energy. Energy is needed to move something. For example, a wind turbine. The wind moves the blades and this movement generates electricity.

This is just like the *Recharge* bike. As you cycle on the bike, it creates movement which generates electricity that you can use to charge your phone!

Give it a whirl! It's also great for your health!

challenges

- Try charging your phone by 10%. How long does it take?
- See how fast you can go!

pixels



The *pixels* play station is basically a huge light box with coloured rods.

challenges

Make a series of light patterns using the coloured pixels. Be creative!

Write your name in lights.

bridge



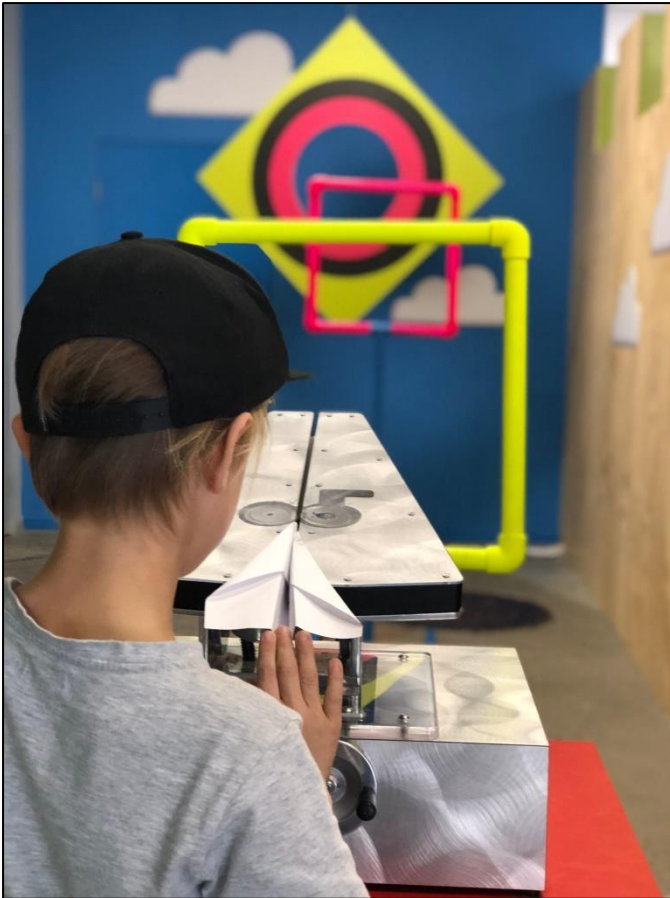
Bridges can be built using a very special shape to be stable. This shape is called a catenary arch.

To assemble *bridge*, put the support pieces in first, then place the rest of the pieces on top. Remove the support pieces, and it will stay together! This is because of the special catenary arch shape. Stable enough to walk on!

challenges

- Team up and see who can make a sturdy bridge the fastest!
- What happens when the cornerstone isn't in the right place?

launch



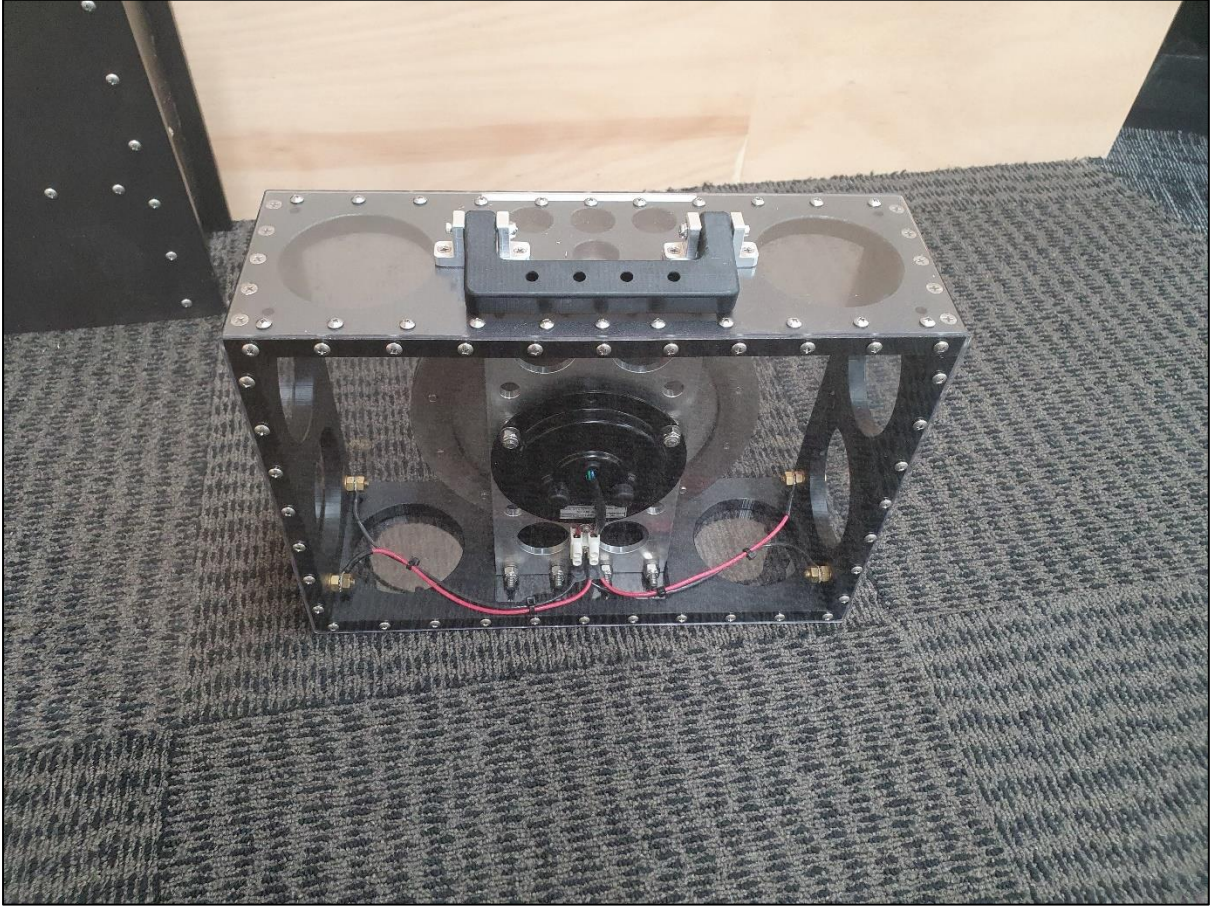
There are a few forces acting on a paper plane, making it fly. Can you take a guess at some of them?

Can you make a plane from one piece of paper and fly it using the paper plane launcher?
Can you improve the aerodynamics of your construction in any way?

challenges

- Make a paper plane that hits the centre of the target on the back wall using *launch*.
- Make a paper plane that goes through both 'goals' and hits the back wall.

gyroscope



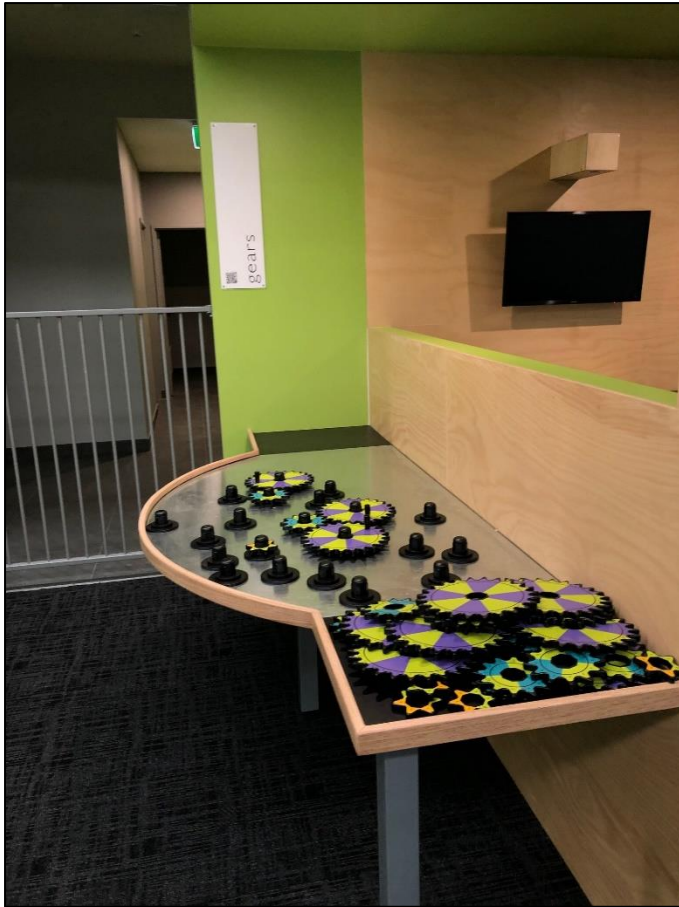
A gyroscope is a device containing a rapidly spinning wheel that can be used to tell when a moving object has changed direction. Our gyroscope is in a briefcase.

Gyroscopes are useful tools for navigation. They help keep aircraft and ships on a steady course.

challenges

- Try spinning the gyroscope around and see how it feels!
- Are some directions easier to move it than others?

gears

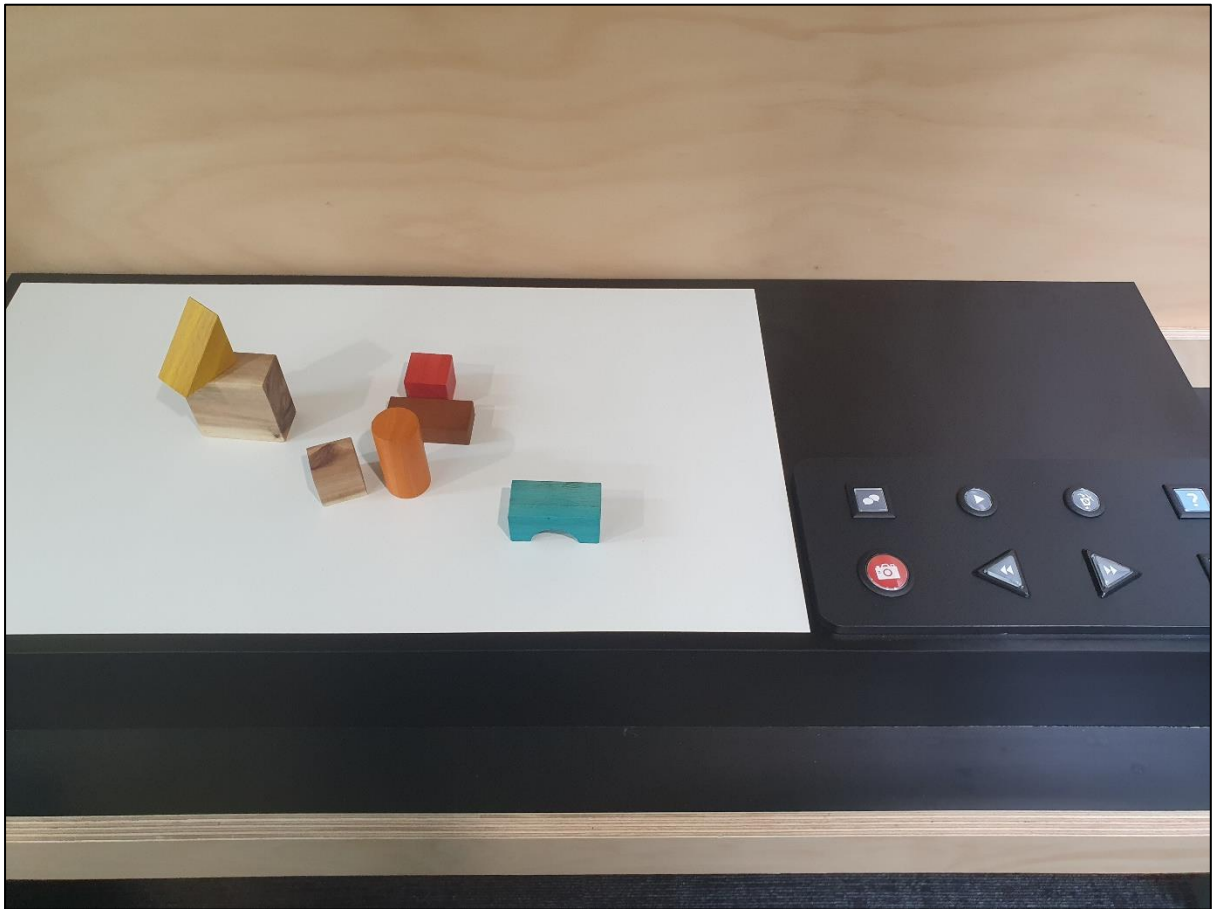


Gears (also known as cogs) are a very common part of any machine and is basically a wheel with teeth that can interlock with other teeth. They are very useful for transferring movement from one part of a machine to another.

challenges

- See how long you can make a chain of gears!
- How many can you get to move by turning one?
- How do you make some spin faster than others?

animate



Stop motion animation is a very early form of filmmaking where objects in a scene are changed slightly for each individual photo that is taken of the scene. These photos are then shown together in order very quickly, giving the illusion that the objects are actually moving in time, and not a series of still photographs. Like the Wallace & Gromit films!

challenges

- Can you make a 5 second movie of some people talking?
- How do you make it look like something is moving across the screen?
- Try putting sound effects to your animation!

fly



Wind is air in motion that you can't see but can feel. A cool fact about wind is that it is an important part of the life cycle of plants. Wind picks up seeds from the parent plant and moves them to a new place far away which helps the plant spread to new areas. Many plant seeds have little wings that allow them to fly through the air. You could try to design a flying machine based on a flying seed design, or you can come up with your own!

challenges

- Make a flying machine using one cup and 4 paper strips. Is it a good flyer? Make some changes and see what happens.
- Make a flying machine that spins.
- Make a flying machine which can touch the roof.

Our Exhibits

Blue Zone

airways



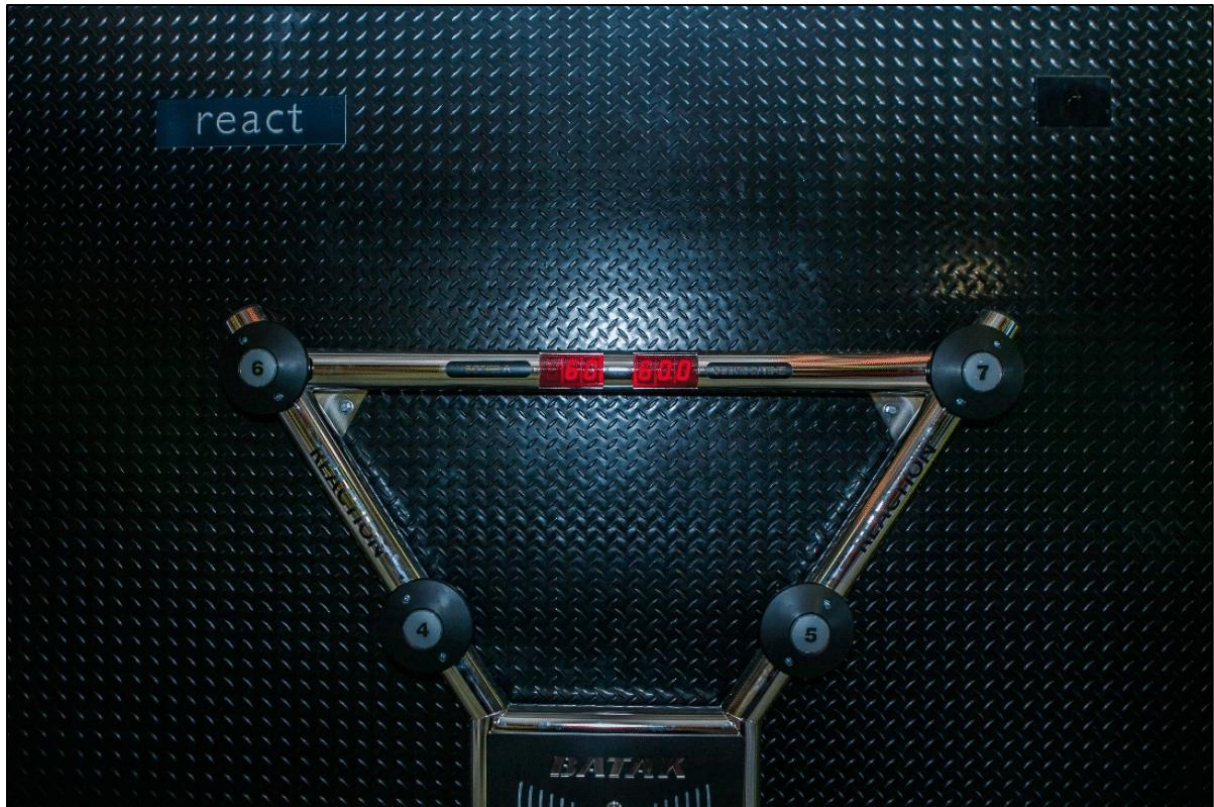
Many living things have airways inside them. In humans, the airway attaches to the lungs which allows us to breathe in oxygen. Have you ever thought about your airway and how you breathe?

Not all animals need air to breathe. For example fish have specialised lungs, called gills, that allow them to breathe underwater.

challenges

- Place 5 balls of the same colour plus one different coloured ball into an opening while holding it open. Your challenge is to catch the odd one out. Can you do it with the distraction of all the other balls? Good luck!
- Have 3 people stand at different boxes and put a ball in at the same time. Which is the fastest route?
- Put in as many balls as you like. Stand back with the bucket, and catch as many as you can.

react



A reflex is a reaction to a situation that your body does without you having to think about it. For example, blinking (when someone throws something in your direction), ducking (when you hear a shout behind you) and jumping (when you hear a loud noise).

You can train your reflexes to be quicker and more accurate by practising things like catching fast moving balls, or playing fast paced video games. Test out your reflexes with *react*.

challenges

- How fast are your reaction times? As the numbers light up, tap them as fast as you can. Aim for a score of 30 buttons in 30 seconds - that's 1 point per second!
- Get a team of 2 and allocate half the lights each. This time, aim for 45 buttons in 30 seconds.
- Grab 4 mates and choose 2 lights each. Can you get to 60? Try and beat the record.

propel



To propel means to push forward or drive an object forward. That's the name of this play station. Propelling rockets, jet engines and even deflating balloons can be explained by Newton's laws of motion. Do you know any of them?

challenges

Construct a rocket and propel it to any one of the bulls eye targets on the wall.

Have a competition with a friend to see who gets the closest.

pendulum



A pendulum is a weight that is held up by a support that can swing freely. Pendulums have been used for many years to keep time.

Fill the pendulum with sand and let it swing! Gravity and the earth's rotation take over and create beautiful patterns called lissajous curves.

challenges

- How many different patterns can you make? Try starting the pendulum from different points and see what happens!
- See if you can make a super small pattern. How about a really BIG one?
- What's the coolest pattern you can make?

kaleidoscope



Spin the big coloured wheels in different directions, stand in front of one of the triangular holes and look through to the other side, what shapes and colours can you see?

challenges

- What happens if you spin the coloured wheels in different directions to one another?
- How about all in the same direction?
- Try spinning the wheels really slowly, what do you see?!

momentum



Build a car, place it on the race track, push the handles down to start the race. What happens to the car's speed as it goes down the hill?

challenges

- Try to beat a friend in the race!
- Build the craziest looking car you can imagine! How did it go?!
- Try building a really small car and a really BIG car! How do they compare in speed?

engineer



Engineers design, build and maintain different constructions like buildings, roads, tunnels and bridges. Engineers connect a jigsaw puzzle of moving parts to create something stable.

challenges

Construct something using every type of blue 'block'.

Build a house that has a door, windows, walls and a roof.

Build an elephant, a kangaroo or a stick insect!

hoops



Why does the ball stay in place while in the direct stream of air from the jet? This is Bernoulli's Principle in action!

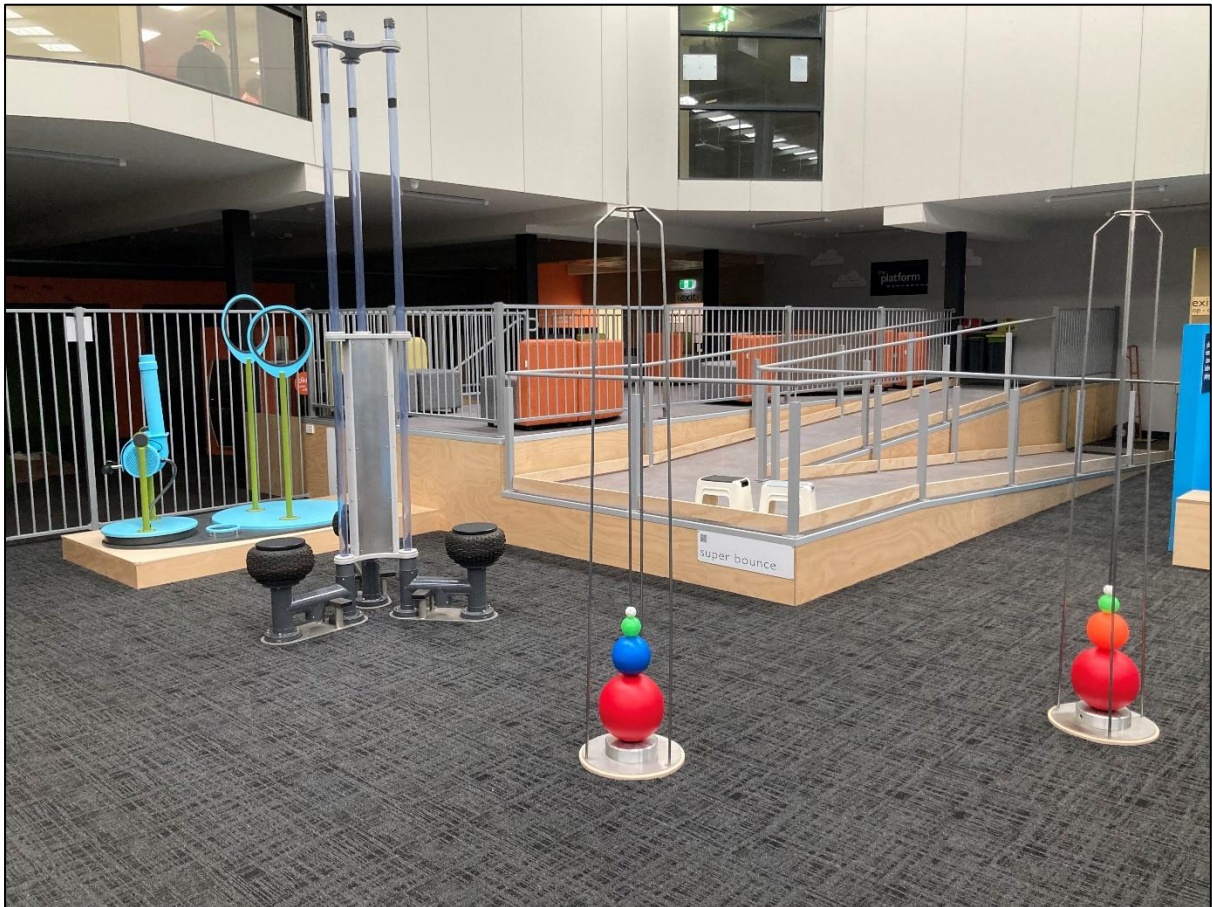
Bernoulli's principle says that as air moves around an object, it creates different pressures on that object. Faster air means less pressure. Slower air means more pressure. Because air is moving fast in the jet stream, it has a lower pressure. The air around the jet is moving slower and has a higher pressure which pushes the ball in and keeps it in the centre of the jet stream.

Can you think of any other examples of the Bernoulli principle?

challenges

- How long can you keep the ball floating in the air while moving the jet?
- See if you can get the ball through both hoops!

super bounce



Momentum happens when something is moving.

Gently lift up the stack of balls, holding onto the big red one, and let them drop! What happens? Do you know why the white ball flies so high into the air?

challenges

- Try dropping the balls from half way, what happens?
- With a friend, see who can get their top ball to bounce the highest!
- How about the lowest?

tracer



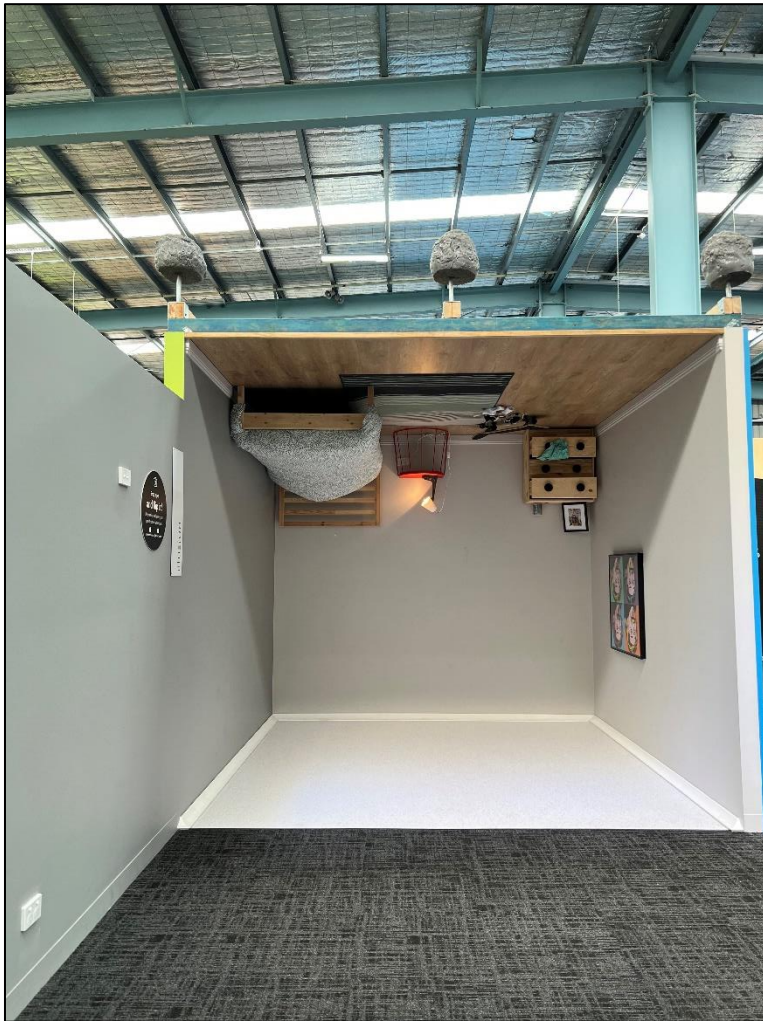
Look at the star in the mirror and trace the outline with the metal pen. Is the star 'desrever'? Do you know how mirrors work?

Did you know that the image that our eyes see is actually upside down! Our brain has to flip this image so we can see the world the right way up!

challenges

- Can you trace the whole star with less than five mistakes?
- How about all in one try!
- Try and make as few mistakes as possible with a friend. Who has the sturdier hand!?

illusion



An illusion is something that looks or seems different from what it actually is. Illusions can reveal how our brains organise and interpret sensory stimulation.

Take a photo in our bedroom and flip it. Can you confuse your brain?