Follow the trail around We The Curious. These are the exhibits you’ll need to find on your journey: (we regularly maintain our exhibits and apologise if some are unavailable)

1. Changing Planet
2. Future fuels
3. Little roters
4. Little growers
5. Pump it up
6. Phase change tank
7. Railway shed
Energy tree
Black sand
View of Earth
What happens to our bodies in space?
Use the blue button and dial to find the **Carbon Tracker** film. Select the film using the white button.

**Carbon Tracker** shows us carbon dioxide (CO₂) levels around our planet. Red indicates higher amounts of CO₂ in the air.

In which kind of locations do you find more CO₂ in the atmosphere? Can you explain why?

Complete the sentences below using the words provided.

- methane
- heat
- temperature
- ice caps
- water vapour
- increasing
- climate change

Gases like carbon dioxide and ________________ absorb ________________ keeping the Earth nice and warm so that life can exist. Human activity is ________________ the amount of carbon dioxide in the atmosphere. This process is causing the Earth’s average global ________________ to rise leading to ________________.

Can you think of ways in which people can reduce the amount of carbon dioxide being released into the atmosphere?
Future Fuels

Can you make hydrogen fuel?

Use your energy to turn the handle and make electricity.

The electricity you generate splits water into two elements.

Can you name the two elements that make up water?

_______ and _______.

Burning hydrogen releases a lot of energy and makes only water pollutants.

Hydrogen is a renewable source of energy because it will never run out. Hydrogen is the most abundant element in the Universe. What are the advantages of using renewable energy sources compared with non-renewable sources?

Which energy sources below are renewable? Can you draw a line linking the energy source to the correct category?

<table>
<thead>
<tr>
<th>Non - Renewable</th>
<th>Renewable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear</td>
<td>Geothermal</td>
</tr>
<tr>
<td>Solar</td>
<td>Coal</td>
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<tr>
<td>Oil</td>
<td>Biomass</td>
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<tr>
<td></td>
<td>Wind</td>
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</table>
Little rotters and little growers

Go to Little Growers and watch the films of plants growing from seeds.

Almost all life on Earth depends on the ability of plants to use sunlight energy in the chemical reaction called photosynthesis.

What 4 things do plants need for photosynthesis?

Go to Little Rotters and watch the films of decaying food. Fungi and bacteria are essential for the Earth’s natural recycling process. They use dead and decaying matter as a source of food and release vital nutrients back into the environment to be used.

Discuss with a classmate, and suggest what would happen to the Earth’s surface if fungi and bacteria did not break down decaying matter?
Pump water into the upper chamber to store energy. Use this energy by turning the valve and letting the water flow.

Look at the rev counter to see how fast the wheel is moving.

The water container has an adjustable height. Experiment with the tank at its highest and lowest points.

Which height do you think will store the most energy and why?

Moving water can transfer a lot of energy. Here in **Pump It Up** the moving water turns the wheel and generates electricity. Hydro-electric dams work by storing water in a reservoir and using the energy of flowing water to generate electricity.

Can you think of any other ways of generating electricity using water?
Find the phase change tank.

This is the UK’s only phase change tank. It can heat and cool the building.

Have you ever seen such a large heater/cooling unit before?

The tank allows us to make use of cheap night time electricity. Power plants generate electricity all day and night. A lot of electricity is not used during the night time, so it is wasted.

The tank contains 65,000 balls. Inside these balls is a chemical called calcium chloride.

When the building is warm, the heat causes the calcium chloride powder to melt and become liquid. Using the heat energy in this way cools the building.

When the building is cool, the calcium chloride changes from liquid to solid.

Do you think this will…

Release (give out) heat and warm the air in the building? ☐

Take in heat and cool the air in the building? ☐

Release (give out) heat and cool the air in the building? ☐
Railway shed

Reusing an old railway shed

The We The Curious building used to be a railway shed and was built in 1904. Look above. Can you see the old railway arches?

Why could it be more sustainable (environmentally friendly) to reuse an old building instead of building a completely new one?

The redevelopment of old industrial sites makes it more attractive for people to live and work in city centre locations and helps reduce the need for cars. How might this help to reduce climate change?

We The Curious site in 1990

We The Curious site in 2010
Energy tree

Making electricity from the Sun

Find the **Energy Tree** in Millennium Square near the Planetarium

The energy from sunlight causes electrons to be released from atoms, allowing an electric current to flow.

Solar energy is renewable. What factors will influence how much electricity a solar panel can produce?

We The Curious has 208 solar panels on the roof, powerful enough to run 11 homes and saving 25 tonnes of CO₂ per year.

What is the best direction for solar panels to face in the northern hemisphere?

The southern hemisphere?

Solar panels on We The Curious roof
Sprinkle the black sand onto the large magnets and observe the patterns that form.

A magnet is a material or object that produces a magnetic field.

The black particles are magnetite, a form of iron oxide. When you sprinkle the black grains onto the large magnets the grains look spiky because they follow the direction of the magnetic field.

The Earth has a magnetic field called the magnetosphere. This field protects the Earth from harmful radiation from the Sun and Universe. Without this field organic life would not survive.

Why are the north and south poles reversed in this image?

Astronauts sometimes travel beyond Earth’s protective magnetic field. In what way could this present a risk?

Can you think of ways to protect astronauts while in space?
View of Earth

Where does space begin?

In this image you can see Earth’s atmosphere.

This thin layer of gases is all that separates you from the vacuum of space and its harmful radiation.

Earth’s magnetic field prevents the solar wind from blowing away our atmosphere.

There is no clearly recognised point at which “Space” begins. Some say it’s 10000km above the Earth’s surface. The Karman Line is at 100km, where the atmosphere is too thin for conventional aircraft to fly.

What fundamental force prevents the atmosphere escaping into space?

What type of radiation is absorbed by the ozone (O₃) layer?

Radio waves

Microwaves

Infra red radiation

Visible light

Ultra violet radiation

X-rays

Gamma rays
What happens to our bodies in space?

Find out how our bodies cope without Earth

Planet Earth provides the right conditions for life to exist.

Life has evolved to live on planet Earth for over 3.5 billion years. Life is perfectly adapted for Earth’s environment.

In space the human body can experience problems due to a number of factors.

In space, astronauts have to exercise up to 2 hours each day. Can you explain why?

Can you explain why astronauts wear a space suit outside the spacecraft?

Discuss what other factors could affect an astronaut’s body while in space?