Our future…
Our actions…
Our vision…

# Our Sustainable Roath Park

Roath Park Primary School, Cardiff
Ysgol Gynradd Parc y Rhath, Caerdydd

STEM 2024

Nursery

# Push and Pull

We are making our very own carts. We hope we can pull them and push them, but first we need to paint them!

# Nursery

We threaded string to use as the handle so we can pull them along

To make the dowels smooth we used sandpaper and then poked them through the holes

# Now we had to construct our carts

# Nursery

We know that wheels should be round with no pointy corners  just like on the cars, buses and bikes.

We used our counting skills to count out 4 wheels

**Nursery**

Do our carts move?
YES!

Can we use the string to pull them?
YES!

Can we use our hands to push them?
YES!

# Time to test our carts

# **Reception** …. How it started:

St Fagans

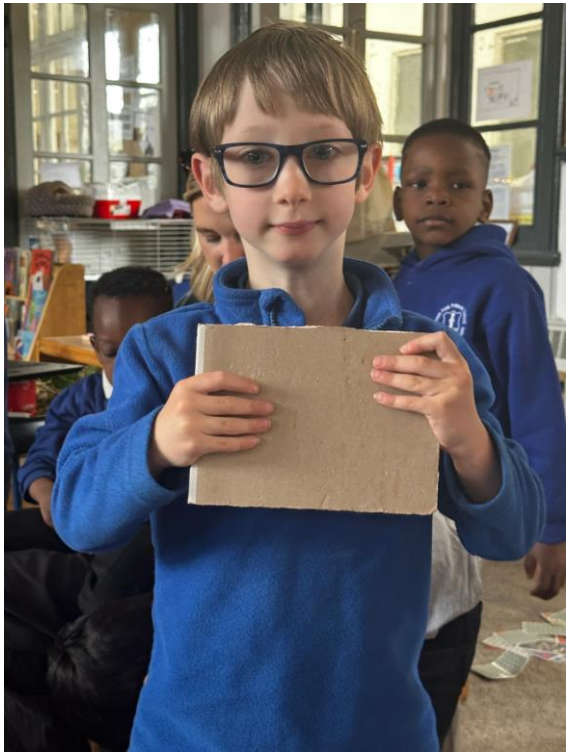
The 3 Little Pigs… Let's find their houses!

A house made of wood

A house made of straw!

A house made of bricks!

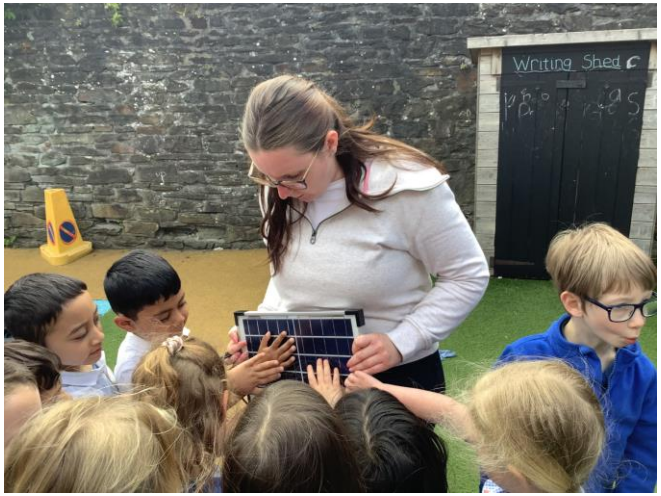
# Visitors like ISG helped us to understand materials…

What was a **Natural Material?**

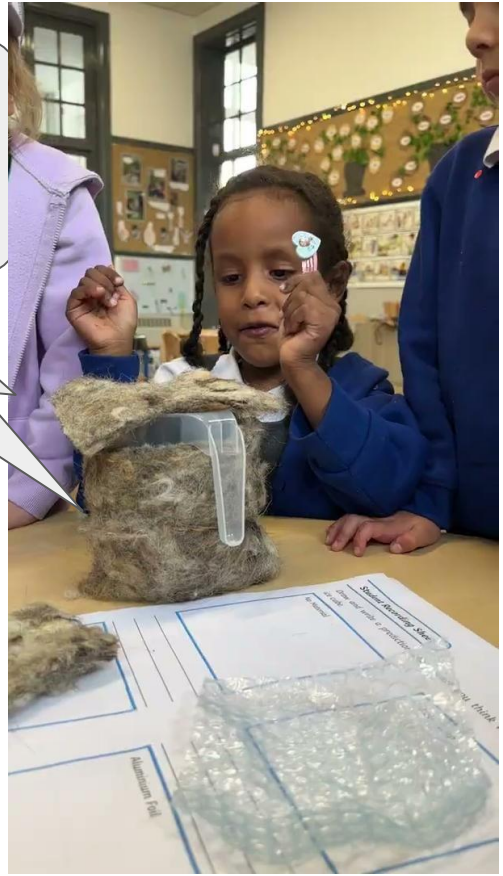
What was a **Man-Made Material….**

We had some thinking to do.




We explored Solar Panels…We asked questions and tried to answer them.

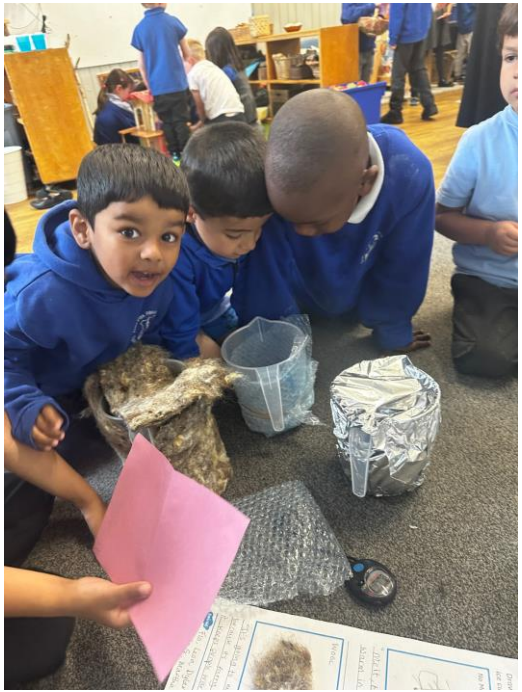
After watching the News all about our school we had lots of ideas about how we could help….



We investigated materials and if they were good at keeping ice cold….

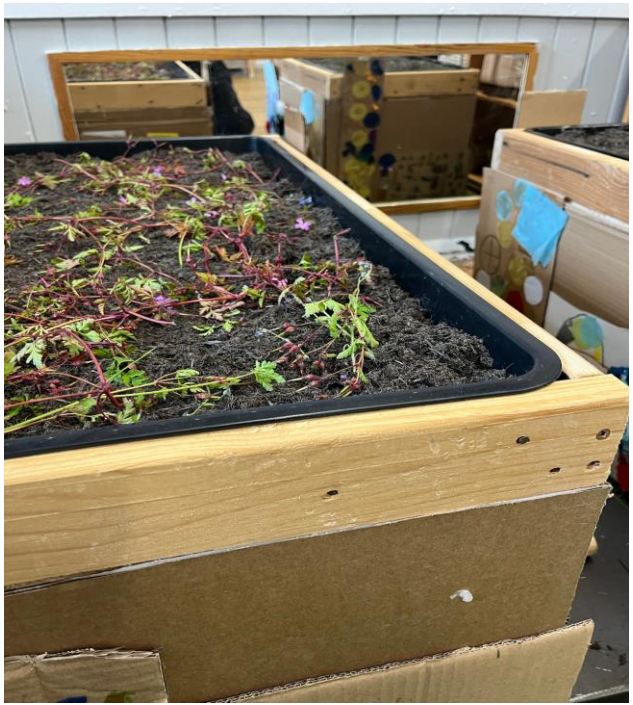
Which is going to be the best… we had lots of ideas….

Careful observations….



Ben from Regeneration Design Management

# Our Roath Park Terraced houses with a green roof!



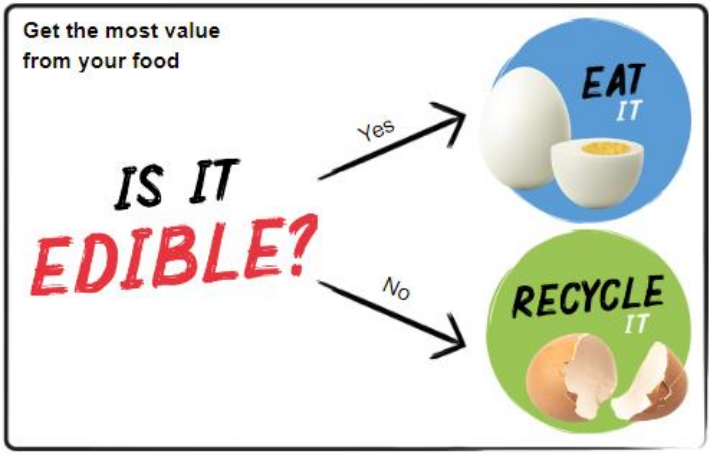
# Year 1

# Roath's Sustainable Eco-Shop

We wanted to find out how we can **reduce** and **reuse** waste rather than throwing it away.


We can replant pepper seeds to continue the cycle of growing.

Angie Spiteri came to talk to use about recycling power and reusing!




We talked about the importance of recycling and how it can be turned into something new.

We went litter picking around Roath to see what we could find!



We decided to design and build our own sustainable eco shop, selling items we have reused and repurposed.

We researched shops in our local area and made our designs based on the needs of the community. We considered the different features.


We conducted experiments to make our own bath bombs using rose petals, and lemon and orange peel from our snack. Look at the chemical reaction!

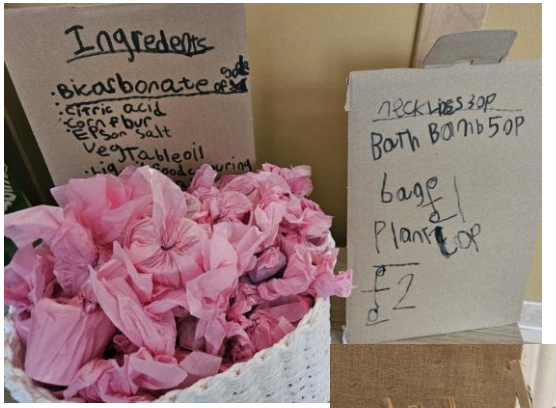
Everyday we use lots of plastic milk bottles. We wanted to turn them into something else - so we planted basil!

We reduced the amount of food waste by measuring out the exact quantity of pasta. Reusing it to make necklaces!

We reused food waste from snack to make our own bath bombs.

We recycled old t-shirts that we didn't need anymore into bags.

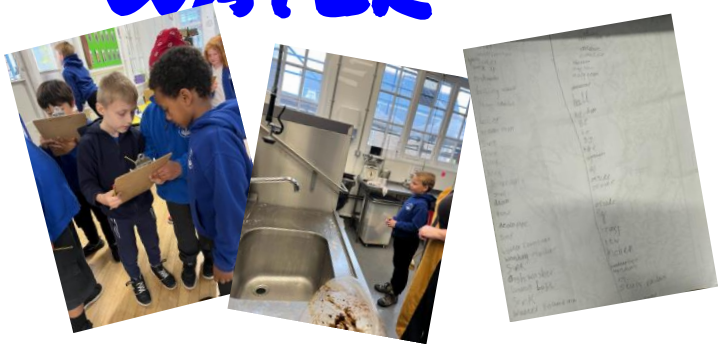
**We made the products for our shop by reusing and recycling, now they are ready to sell!**




We made a duplo model of our shop, including all the key features - even a trolley park!

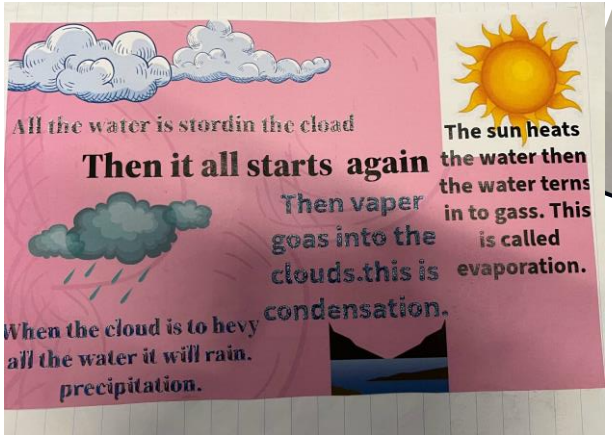

# Year 2

## WATER



We went around the school to complete a survey to find out where water existed in our building.

We started our STEM week by learning all about water and the water Cycle. We wanted to know where our water came from and how we could conserve our water.




Knights Brown came into school and completed a workshop all about conserving water and then explained all about Rain Gardens and how brilliant they are for our environment.


We got to be Civil Engineers for the morning!


Once we had learnt about Rain Gardens we made our own mini versions.

can with Seesaw to view this work!

Then we made a larger model to go with our school house model.

Scan with Seesaw to view this work!

Wouldn't it be great to have a Rain Garden at the ends of our streets!?

We made a model of the School house and came up with lots of different ways we could conserve water use in each of the rooms in the house.

We have fitted our own guttering and water butt to the cabin outside our classroom, we now have water for all the planters in the school yard without using clean water!!

Year 3

# Solar Energy

We have been exploring the benefits of using solar energy. We have had lots of visitors this week who have helped us to learn about how the sun can be used to generate energy for our homes and businesses in our local community.


Connall from Solar Power

Working collaboratively

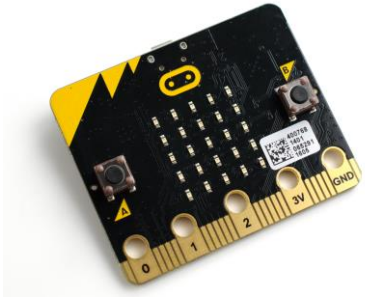

Eleri Brown from AECOM

We used Solar Buddy Kits to make six different models including a solar puppy and car. It was fiddly business making the gearbox. We took them outside to see if they would work.

Will we have enough sun to power our robots? 🤔

Cara's Mum and Techo Camp showed us how to program a micro:bit. We learnt how to use different sensors to take light, temperature and sound readings.

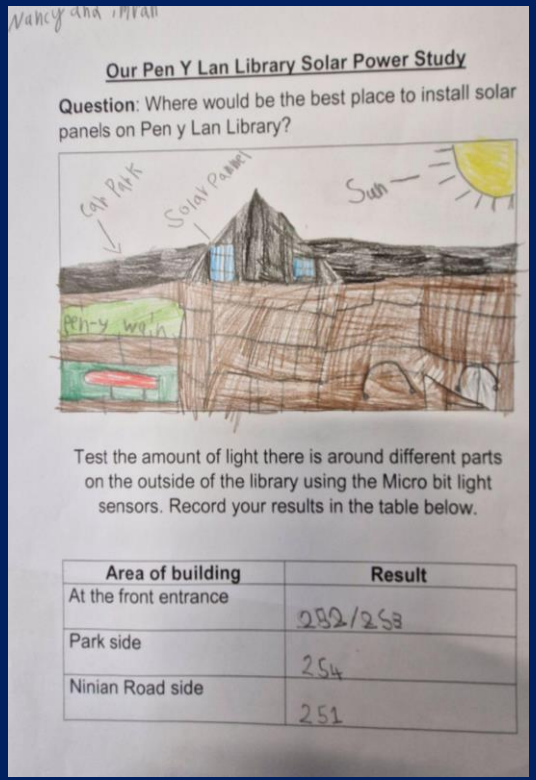

micro:bit




We had so much fun sending icons from one Micro:bit to another.We also learned how to play "Rock, Paper, Scissors on the Micro:bits.

We visited Pen y Lan Library and used the Micro:bits to take light readings at different areas around the outside of the building. We recorded our results in a table.


We found out that the best place to fit solar panels on the library roof was on the car park side of the library as it got the most sun.



Our Pen Y Lan Library Solar Power Study

**Question**: Where would be the best place to install solar panels on Pen y Lan Library?



Test the amount of light there is around different parts on the outside of the library using the Micro bit light sensors. Record your results in the table below.

| Area of building | Result |
|---|---|
| At the front entrance | 252/253 |
| Park side | 254 |
| Ninian Road side | 251 |


We had a brilliant week learning all about solar energy and enjoyed creating our model of Pen-y-Lan Library with 'hybrid' lighting!

**STEMTASTIC!!**

Roath Park Primary School, Cardiff

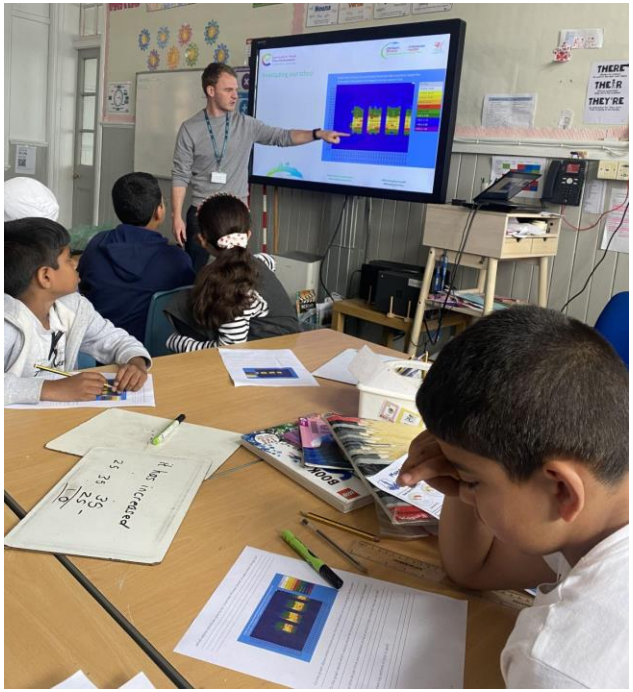
Ysgol Gynradd Parc y Rhath, Caerdydd

STEM 2024

# Year 4

After watching the RPPS News video, we looked at the data…

Joe from *One Planet Cardiff* helped us analyse some interesting graphs which showed our energy usage.



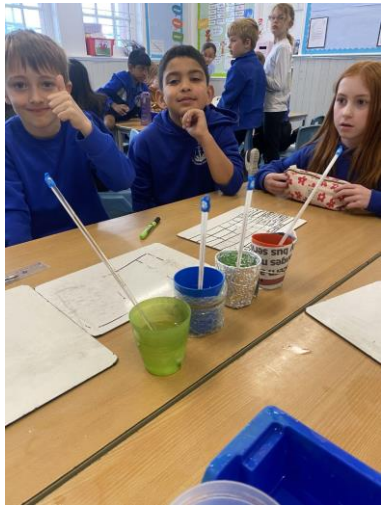

| Score | Operational rating | This building | Typical |
|---|---|---|---|
| 0-25 | A | | |
| 26-50 | B | | |
| 51-75 | C | | |
| 76-100 | D | 80 D | |
| | | | 100 |
| 101-125 | E | | |
| 126-150 | F | | |
| 150+ | G | | |

## Total carbon dioxide (CO2) emissions

This tells you how much carbon dioxide the building emits. It shows tonnes per year of CO2.

| Date | Electricity | Heating | Renewables |
|---|---|---|---|
| May 2014 | 10 | 16 | 0 |

We realised that our school is not well insulated.
We do not have loft or wall insulation, roof insulation or double glazed windows.



We explored insulation and investigated which material provides the best insulation.

Architects, Gareth Brown and Daniela De Santis, told us about other ways we can make a building more energy efficient.

This inspired us to explore garden roofs and green walls….

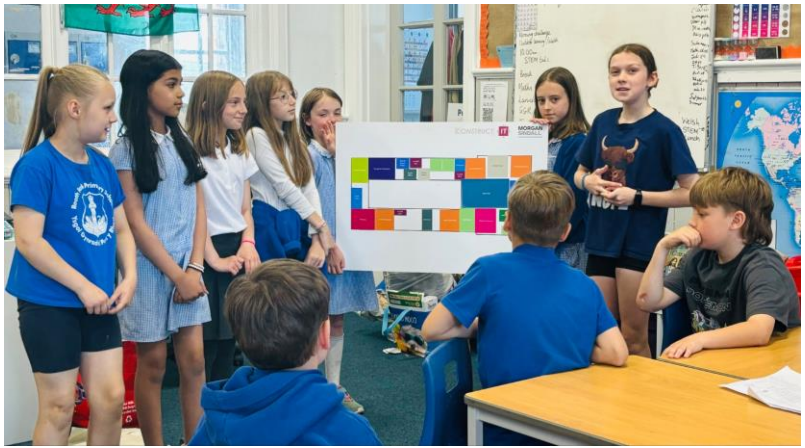

We planted lavender seeds and learnt all about the benefits of lavender.

# Making our Model…

# Insulating the loft and walls

# Year 5

## We had visitors in Year 5 this week…



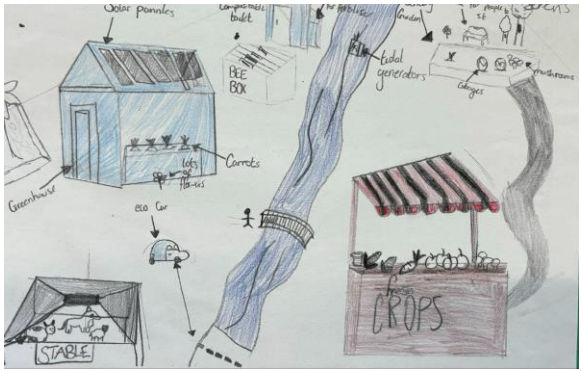
Morgan Sindell gave us the opportunity to work in groups to design and budget a brand new school!

Bute Energy taught us about *renewable energy*.

We used **wind power** in our model!

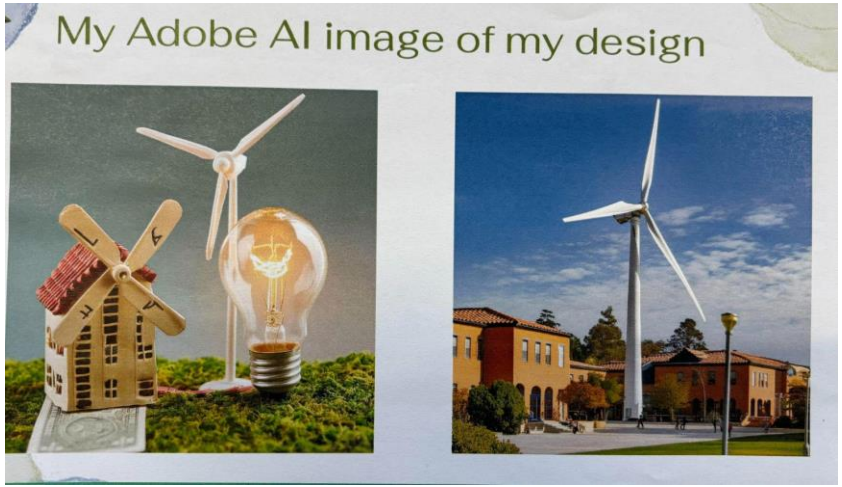

As a year group we created a list of renewable energy sources and started our task of designing a more sustainable Roath!

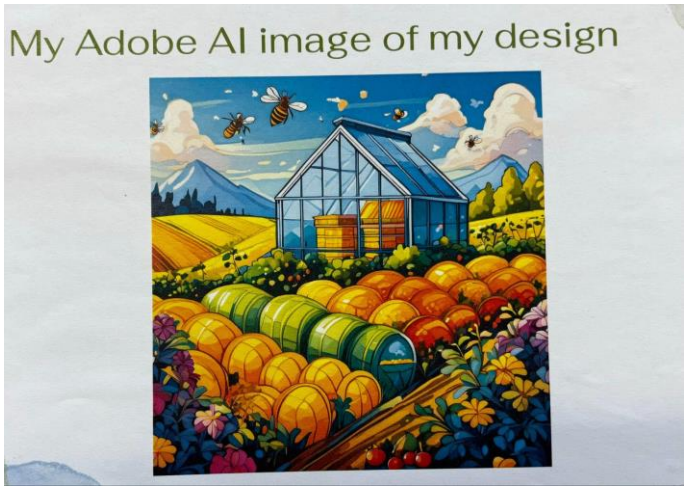
Here are a few examples of our designs…





After creating our initial designs and sharing our ideas, we created AI images of our designs to clearly illustrate our plans.

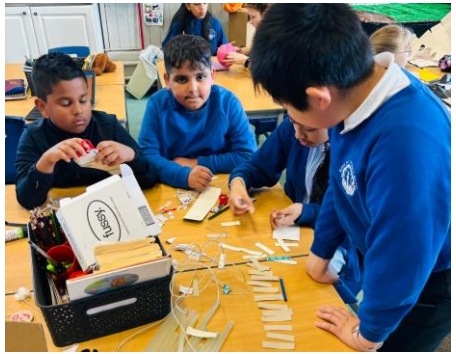



After deciding to re-design Roath greenhouse and flower gardens to be more sustainable we decided on these key features:

- **Grow** our own fruit and vegetables
- Plant a wildflower garden to help the **bees**
- Use **wind** and **hydro** power to power our buildings
- Create our shop on site to **stop transport** of our goods

Then the fun began as we worked together to create our model!



# Year 6

Year 6 have had **two projects** going on this week:

1) Designing and building a model of a **sustainable school**.
2) Creating an infographic comic board all about **sustainable transport**.

We started by looking at **structures** with *Stuart Brown* using spaghetti and marshmallows.

With the help of *Atkinsrealis*, we looked at an **aerial map of Roath** and our school and planned how we could make the area more **sustainable and eco-friendly**.

We researched **'Green Schools'** and their features to help with our designs.

## Green School Features

### Sustainable Glass Roofs

Sustainable glass roofs ensure that no heat is lost in the winter. Also, it brings in more light into the school. Furthermore, Sustainable Glass Roofs will make sure that the room does not heat up any further (in the summer). This certifies a perfect climate in the school all year. So, overall we can say that Sustainable Glass Roofs are super weatherproof.

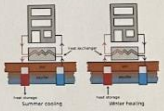
### Solar Panels

Solar Panels capture all the sun's energy and converts it into free electricity that you can use all throughout the school. It is used to cook food, heat water and generate electricity. Having Solar Panels increases the value of your home. Installing solar panels lets you use free, renewable and low carbon electricity. In fact, there were more than 183,000 Solar panel Installations in 2023 across the UK. They don't need direct sunlight to work and can even work on cloudy days.

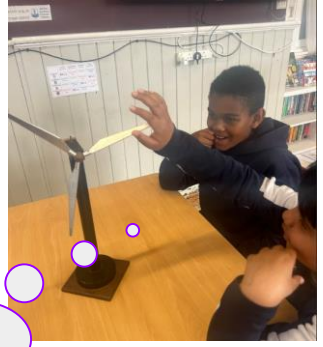
### Green Roofs

There are many great purposes of having Green Roofs such as… absorbing rainwater, creating an environment for wildlife and it reduces stress for the people around the roof by providing a very pleasing landscape. Moreover, a green roof provides fresh air and lots of shade.Green roofs save energy and are sustainable. Having a green roof increases the lifespan of your roof to 40-50 years. A Green Roof is 4-6 inches thick(10-15cm).

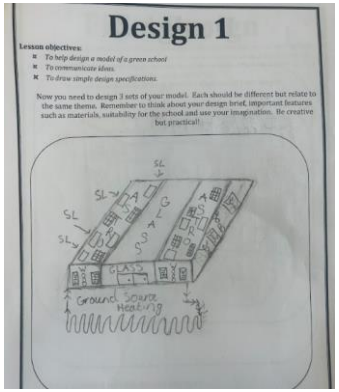
### Ground Sourced Heat Pumps

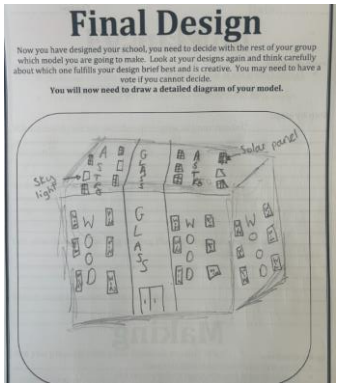


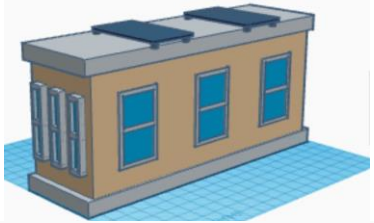
Ground Sourced Heat Pumps in a school provides free heat from the ground which keeps staff and pupils warm with hot water and heat all throughout the year. Both old and new schools can benefit from the renewable Ground Sourced Heat Pumps. Also, they are very safe and have long lifespans. They heat up radiators as well. Ground Source Heat Pumps work by absorbing the natural heat from the ground and transferring it into the building.

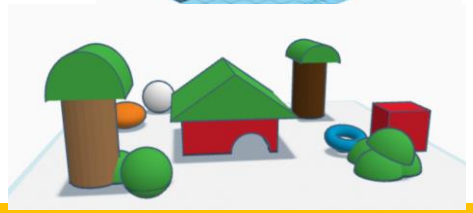


*Are these energy sources renewable?*



We experimented with ***Tinkercad*** - an online 3D modelling program.

Mr Burnett helped us cut the wood needed for the model structure

# Our final model!

Solar panels

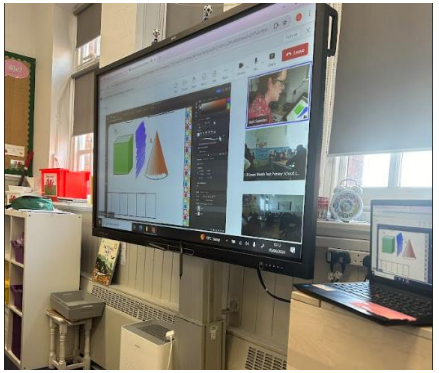


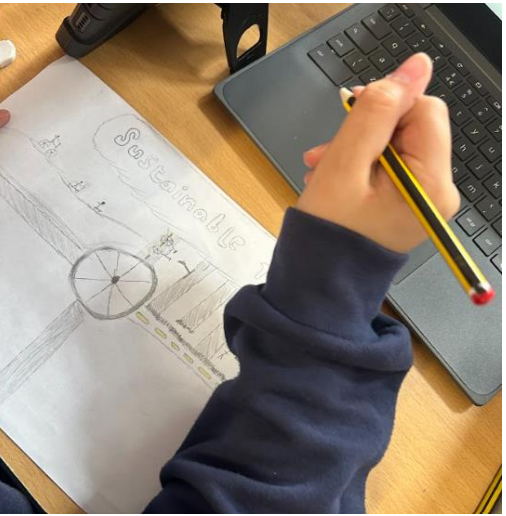
Our atrium

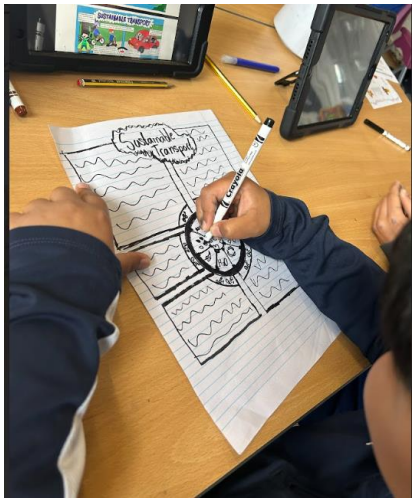
Our ground sourced heat pump

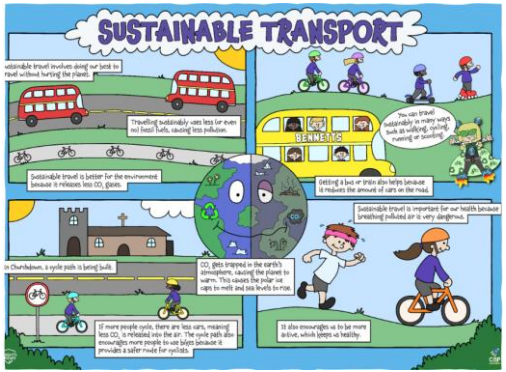
Passivhaus walls

We had a Teams call with **Beth** from ***CISP multimedia*** about our upcoming infographic project funded by *Knights Brown*. ***Knights Brown*** are leading the project for the new **cycle route** in Roath Park.





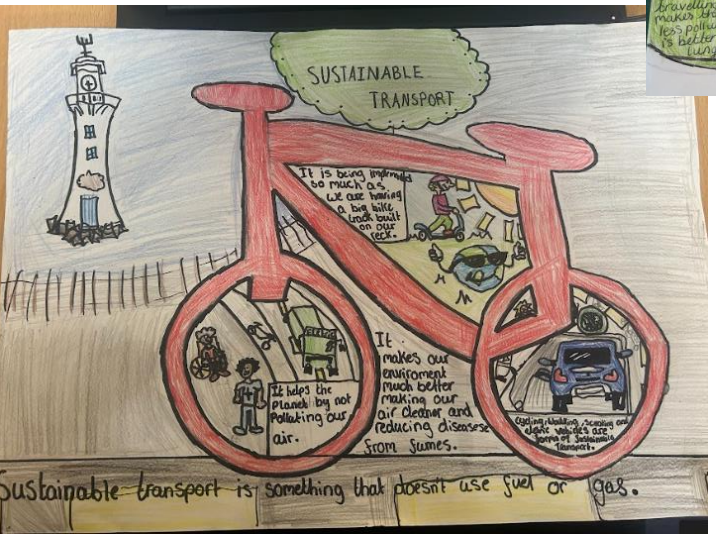





We talked about how **sustainable transport** has been implemented in Roath and started our infographic designs!

We submitted all of our final designs to CISP ready for a digital recreation.


CISP will combine our designs and create an **A1 poster** for us to keep in our school - all about sustainable transport!
*We can't wait to see it!*




CISP multimedia ltd

**With a special thanks to all of the parents and companies that came in to support this project:**

- Morgan Sindall
- ISG
- JLL
- Scitech Engineering Ltd
- WRAP
- BECT
- Techno Camps
- Knights Brown

- Bute Energy
- Atkins Realis
- Regeneration Design and Management Ltd
- One Planet Cardiff
- AECOM
- KWL Architects
- WS of Archi