

# GSC Learning Lab

## Family Support Pack 1.



Contact us at:  
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# Welcome

**Hello and welcome to Glasgow Science Centre (GSC) Learning Lab: Our World Our Impact! In this section, we'll introduce you to the programme and the people behind it.**

## What is GSC Learning Lab?

GSC Learning Lab is an exciting new STEM learning programme developed by GSC and delivered by teachers. During the programme, pupils will explore a range of STEM topics using videos, class and home activities. Through this project we aim to support schools and parents/guardians with STEM learning which incorporates the Curriculum for Excellence. We aim to promote and encourage family learning and facilitate consistency and connections between school learning and home learning.

## GSC Learning Lab: Parents and guardians supporting role

Parents and guardians have always played an important role in their children's education. In recent times, this has become more apparent than ever, with many families suddenly faced with an even bigger role in helping support their children's education from home, often with little guidance or support for themselves. This pack has been designed with parents and guardians in mind. Its aim is to provide extra information and support for you, so you and your family can learn together during and after the GSC Learning Lab programme. We're hoping that it allows you to be more informed and confident in supporting your child's learning, and be even more connected to your family through experiencing what, how and why they are learning.



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# Who we are



## What is Glasgow Science Centre (GSC)?

Glasgow Science Centre is an educational charity that wants to inspire everyone to explore and understand the world around them and to discover and enjoy science. Our vision is a Scotland where all people feel empowered through learning and engagement with science to make positive differences in their lives, their communities and to society as a whole. The GSC building can be found on the banks of the River Clyde in the south of Glasgow.

## Who are the CLD team?

CLD stands for Community Learning and Development. We are a friendly team at GSC, who are dedicated to engaging and empowering communities with Science, Technology, Engineering, and Maths (STEM).

We aim to do this through working in partnership with communities and sharing our collective knowledge and experiences with each other to build confidence, understand and relate STEM to our everyday lives, and promote change and empowerment.

## As well as this pack, we also offer other methods of support for you during the GSC Learning Lab programme. These include:

Live sessions on Zoom with the GSC CLD team to explore this pack and discuss any questions, challenges or worries you might have about supporting the GSC Learning Lab programme at home. If you would like to take part in one of these sessions, please contact the CLD team by email.

An online parent/guardian support Facebook group, which you can find here: (GSC Learning Lab) [www.facebook.com/groups/305273317373773/](https://www.facebook.com/groups/305273317373773/) This group is a safe space where you can share and discuss your experiences of the programme with other parents, ask questions or find support with the different activities involved in the programme from the CLD team.

Contacting the CLD team directly via Facebook Messenger on the Facebook group, or by email.



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The 'Our World Our Impact' learning programme is based around 4 modules:

**Climate and Weather**

**Energy**

**Biodiversity**

**Food**

During the learning programme, pupils will investigate our changing world and how it is affected by human choices and actions; it explores our connection to the changes happening on our planet.

Within each module, pupils will participate in learning activities at school and at home. At school, they will take part in 2 classroom based activities. At home, they will take part in 1 activity to support and extend their learning in school. This booklet contains information on what the home activities will be, as well as supporting information and resources for each activity.

- This is the first pack you will receive as part of the programme. This pack contains information about the 'Climate and Weather' and the 'Energy' modules. You will receive a second pack which contains information about the 'Biodiversity' and the 'Food' modules later in the programme. A digital version of this pack can also be found on GSC's website: <https://www.glasgowsciencecentre.org/learninglabparents>

# The Curriculum for Excellence (CfE)

The Curriculum for Excellence (CfE) is Scotland's school curriculum framework for young people aged 3-18. It is designed around learners to provide them with the knowledge, skills and attributes they need for learning, life and work. It aims to enable all learners to become:

- Successful learners**
- Confident individuals**
- Responsible citizens**
- Effective contributors**

All of the learning activities and experiences your child will participate in during the GSC Learning Lab programme have been developed to incorporate the CfE, and therefore, supports and enhances your child's learning.



# Climate and Weather



## Background information

### Climate change

Climate change describes a change in average weather conditions, like temperature and rainfall, over a long time. Climate change does happen naturally, but the actions of people are speeding it up because we are releasing more climate change inducing greenhouse gases than ever before into the atmosphere.

### What is our carbon footprint?

Our carbon footprint tells us what effect our activities have on the natural environment. In particular our carbon footprint focusses on the greenhouse gases that are released because of these activities. Greenhouse gases include carbon dioxide, methane, nitrous oxide, ozone and water vapour. Examples of human activities that contribute to high levels of greenhouse gases are:

- **Burning fossil fuels; which has traditionally been done to generate electricity and heat.**
- **Deforestation; This means removing forests and trees, that would usually capture and store carbon dioxide.**
- **Agriculture; Methane is released by livestock and nitrous oxide is used in fertilisers.**

### Climate and Weather

These greenhouse gases cause warming because they are efficient at trapping heat energy. Scientists agree that climate change is now happening at a rate of 0.15-0.20 °C every decade. It might not seem like much but this rate of warming is causing glaciers to melt and sea levels to rise, as well as changes to the behaviour of plants. Most of this warming has happened since 1975, with the burning of fossil fuels being a major contributor. This warming is causing an increase in average rainfall. A warmer atmosphere can hold more water, resulting in more rain. Rising global temperatures threaten human health, increase the risk of different types of extreme weather and damage ecosystems.

### Climate change across the world

There are many possible consequences of changing climate to our planet. Here are just a few:

- **Habitat loss and changes, affecting local wildlife populations.**
- **Growth in numbers of plants and animals that thrive in warmer conditions, these plants and animals could compete with our native species.**
- **While warmer temperatures mean we could grow more food, there could be a rise in pests that eat our growing food.**
- **Loss of coastline due to rising sea levels.**
- **Summertime droughts but also more flooding, both of which could be damaging to businesses and communities.**



## Cloud Journal Home activity outline

This gives an overall outline of the activity your child will have been asked to complete at home.

This activity will help to build confidence in making scientific predictions and an understanding of different types of clouds.		<b>Resources</b> Home activity worksheet - Cloud Journal
<b>Activity</b>	<p>In class we have been learning that observing the weather over a long period of time is important in understanding climate change. We have used rain gauges to measure rainfall over 5 days.</p> <p>Use the worksheet to observe the clouds for 5 days, draw them and try to identify the type of cloud using the images and descriptions of common clouds provided.</p> <p>Make a prediction about whether it is going to rain. Return to the worksheet later in the day to check if your prediction was correct.</p>	
You may be interested to know that while we may get our fair share of rain here in Scotland, the rainiest town on the planet is reported to be Mawsynram in India. Their average rainfall is 11,971 mm per year. For comparison, the average rainfall for the whole of the UK is 1,154 mm per year.		

A copy of the worksheet your child will use for the home activity.

## Home Activity

# Cloud Journal

Keep a cloud journal for 5 days. Look at the clouds and predict whether it will rain or not.





In the table, draw or describe the clouds you see in the sky. Try to identify the type of cloud you see using the cloud finder table. Write down if you think it will rain or not. Return to the worksheet 2 hours later and write down whether it rained or not in the final column.



Day	Draw or describe the clouds	Cloud type	Will it rain?	Did it rain?
1				
2				
3				
4				
5				



## Cloud Finder Table

Cloud shape	Cloud type	Description
	Cumulus	A common cloud. They are fluffy and shaped like a cauliflower. Usually spotted in fair weather but can also cause some rain or snow showers.
	Cirrus	High in the sky and patchy. Delicate and wispy like hair. Whiter than other clouds, they don't lead to rain.
	Stratus	Clouds that cover the sky in a grey or white blanket. If thick enough, they will cause light drizzle or rain or snow.
	Nimbus	A cloud that causes rain, hail, sleet or snow. They usually appear darker than other clouds and can either look fluffy or be spread across the sky like a blanket.

## Support notes



Below, you will find a selection of website links, resources and ideas to support the 'Climate and Weather' module and the 'Cloud Journal' home activity.

### 'Climate and Weather' module:

- **The Met Office** - Learn about topics such as how the weather is forecast, what climate change is and what the weather is like on other planets:  
<https://www.metoffice.gov.uk/weather/learn-about/weather>
- **The Met Office DIY activity** - Can you create a piece of art, a video or a model showing the way that weather makes you feel? Get creative and make something which describes the weather in an interesting and thought-provoking way: [https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/met-office-for-schools/diy-activities/exploringextremeweather\\_diyactivitypack\\_final.pdf](https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/weather/learn-about/met-office-for-schools/diy-activities/exploringextremeweather_diyactivitypack_final.pdf)
- **NASA Global Climate Change website** – Explore facts about climate change, including the evidence, the causes and the consequences: <https://climate.nasa.gov/>
- **NASA Climate Kids** - A fun selection of interactive online games on topics like coral bleaching, reducing carbon dioxide (CO<sub>2</sub>) emissions and using renewable energy sources to generate electricity: <https://climatekids.nasa.gov/menu/play/>
- **BBC iPlayer programme: Climate Change – The Facts.** Sir David Attenborough looks at the science of climate change and potential solutions to this global threat: <https://www.bbc.co.uk/iplayer/episode/m00049b1/climate-change-the-facts>
- **Dynamic Earth, Edinburgh** – An interactive discovery centre with a focus on planet Earth. You can visit in person or explore their website to find out more, and discover activities you can do with your family: <https://www.dynamicearth.co.uk/>

### 'Cloud Journal' activity:

- **The Met Office website** - Find out what clouds are made of, how they form and their different names:  
<https://www.metoffice.gov.uk/weather/learn-about/weather/types-of-weather/clouds>
- **Cloud Conversations** - Have a think about, discuss and note down your ideas to these questions with your family. Once you have got some ideas, do some research online or in your local library to find the answers:
  - We see clouds outside in the sky, but can you find any clouds inside your home? E.g. when the shower is on or the bath is running, when the kettle is boiling, etc.? Note down where you see them.
  - What are clouds made of?
  - Think about touching a cloud – what do you think it would feel like?
  - Why are clouds white? Why do they sometimes turn grey?
  - Are clouds and fog the same or different?
  - What is the weirdest shaped cloud you've ever seen?





## Energy

# Background information

### What is energy?

Energy is a property that an object can have, that gives that object the ability to do work. Energy makes things move, makes machines work and is needed in our bodies to function.

The main forms of energy are: heat, light, sound, electrical (electricity), chemical, magnetic, kinetic (movement), elastic potential, gravitational potential, and nuclear. Energy transfers happen all around us. The law of conservation of energy states that energy cannot be created or destroyed, instead energy can change from one type to another. For example, the electrical energy entering a lightbulb is converted to light energy and a small amount of heat energy too.

In the case of battery powered appliances, the battery converts chemical energy within the battery into electrical energy which is then converted by the appliance in order to work.

### Scotland and energy

Scotland is generating more electricity than ever before using renewable sources, with the biggest contributor being wind power from turbines and wind farms, such as Whitelee Windfarm, located south-west of Glasgow. Other renewable energy sources are hydroelectric, geothermal, solar power, tidal power, wave power and biofuels. Nuclear fuel isn't a renewable source as it will eventually run out. However, generating electricity from nuclear fuel releases much less greenhouse gases than burning fossil fuels. For a long time, most of the world has been burning coal in power stations to generate electricity. Coal is a fossil fuel along with oil and natural gas. The burning of fossil fuels to generate electricity has many issues. Fossil fuels are non-renewable so will eventually run out, as we are using them much faster than they can be made. When coal and oil are burned they release a gas called sulfur dioxide, which pollutes the air and is a cause of acid rain. When any fossil fuel is burned they also release carbon dioxide, which is a greenhouse gas. Greenhouse gases are accelerating climate change.

The Scottish government has a target of generating 50% of Scotland's heat, transport and electricity needs from renewable sources by the year 2030. There is also a 2050 target for the Scottish energy and transport sectors to be releasing almost no greenhouse gases.

### Saving energy in the home

Being mindful of the energy we use at home is good practice for many reasons. Saving money is a major factor, but if there was less overall demand for energy then greenhouse gas emissions from the energy sector would be lowered, and there would be less demand for building new electricity generation infrastructure.

When saving energy in the home, turning off appliances when not in use is crucial, but heating the home should also be taken into consideration e.g. you could turn down the thermostat by 1°C, or reduce the amount of time the heating is on for. Many homes use gas central heating, burning natural gas which is a fossil fuel.



## Energy

Watch the video which complements this home activity here:

<https://www.glasgowsciencecentre.org/learninglabhomework>

## Energy Poem Home activity outline

This gives an overall outline of the activity your child will have been asked to complete at home.

This activity is helping to build literacy skills, and an understanding of the energy types that are all around us.		<b>Resources</b> Home activity video Home activity worksheet
<b>Activity</b>	<p>In class we have been learning about different types of energy and where they can see these different energy types, focusing on household appliances that use electricity.</p> <p>Think about how you use and see energy in your daily lives, considering transport, electrical appliances, and any energetic activities that you take part in. Create sentences that highlight different parts of their day that use energy, with each sentence starting with a letter from the word “Energy”. This is known as an acrostic poem.</p> <p><b>Here is an example:</b></p> <p><b>E</b>very day I eat breakfast to have energy for school in the morning.</p> <p><b>N</b>ormally I catch the bus, which burns petrol to give the wheels movement energy.</p> <p><b>E</b>lectricity gives the light bulbs in my class light energy to help me see.</p> <p><b>R</b>unning around with my friends uses movement energy and sound energy when we laugh!</p> <p><b>G</b>oing swimming after school needs my body to use movement energy, and the heated water has heat energy.</p> <p><b>Y</b>esterday I plugged in the vacuum cleaner, which uses electricity to make movement and sound energy.</p>	
You may be interested to know that Scotland is on track to making half of its energy using renewable sources by 2030. Just now most of our renewable energy comes from wind turbines, and this will continue to be an important energy source for us.		



A copy of the worksheet your child will use for the home activity.

## Home Activity

### Energy poem

Think about all the ways that you see energy in your daily life. This could include using transport, appliances that you use, or even energy that your body uses to move around and have fun. Write some sentences below that describe energy in your daily life, using the big letters to start the sentences.



**E**

**N**

**E**

**R**

**G**

**Y**

## Support notes



Below, you will find a selection of website links, resources and ideas to support the 'Energy' module and the 'Energy Poems' home activity.

### 'Energy' module:

- **BBC Bitesize: What is renewable and non-renewable energy?** This article includes a video about renewable and non-renewable energy sources and 2 interactive quizzes:  
<https://www.bbc.co.uk/bitesize/topics/ztv4q6f/articles/zmwm6v4>
- **GSC At Home: Energy – What's the big idea?** - This video gives an introduction to what energy is and how it works, some different types of energy, and some energy phrases that you might have heard of: [https://youtu.be/WPI6d\\_cqa5c](https://youtu.be/WPI6d_cqa5c)
- **GSC At Home: Future Transport** – This video gives you the mission of designing your own transport of the future! What will it look like and how will it be powered?:  
<https://youtu.be/lwMsGx7kH18>
- **Whitelee Windfarm and Visitor Centre** - Whitelee is the UK's largest onshore windfarm, located on Eaglesham Moor just 20 minutes from central Glasgow. Its 215 turbines generate up to 539 megawatts of electricity, enough to power just under 300,000 homes. With more than 130 kilometres of trails to explore, on foot, by cycling or by horse, with free parking and free entry to our onsite Visitor Centre, Whitelee is a great destination for a day out with the whole family: <https://www.whiteleewindfarm.co.uk/>

### 'Energy Poems' activity:

- **Watch the GSC activity Hook video** which will get you thinking about different types of energy all around us and energy transfer:  
<https://www.glasgowsciencecentre.org/learning-lab-homework>
- **BBC Bitesize: What are Acrostic Poems?** This article includes a video about what acrostic poems are and an interactive exercise:  
<https://www.bbc.co.uk/bitesize/topics/z4mmn39/articles/ztdvw6f>
- **STEM.org: Things That Use Electricity** – While watching this video, try to identify all the things you see which use electricity. Use this to help you identify all the things in your own home which use electricity. Think about where that electricity might have come from - what could have been the energy source, e.g. gas, oil, wind, water, sun etc.?:  
<https://www.stem.org.uk/resources/elibrary/resource/30647/things-use-electricity>



# The Spark



PUZZLES, QUIZZES, OUTDOOR LEARNING

Each issue of **The Spark Magazine** is packed with exciting experiments, fascinating facts, and puzzles and curious quizzes to challenge your family. Our accompanying audio series, **A Spark of Science** has brilliant bite size sounds to spark your curiosity.



Catch up on past issues at [glasgowsciencecentre.org/the-spark](https://glasgowsciencecentre.org/the-spark)



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[gsc.org.uk/learn/gsc-home](https://gsc.org.uk/learn/gsc-home)



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## Are you interested in finding out more and participating in further learning?

The CLD team at GSC offer adult-focused discussion-based science workshops, relating science to real life experiences and our everyday lives. Our **'Let's Talk About...'** workshops cover a range of topics and aim to:

Engage new and diverse participants with everyday science learning.

Raise awareness of science impacts in our everyday lives.

Develop an introductory knowledge of science topics, language and applications in everyday life.

Increase participants confidence and become more empowered and active citizens.

If you would like to find out more, please contact the CLD team directly by email or through the GSC Learning Lab Facebook group.

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**We hope you have found this pack useful, please get in touch with us if you have any questions.**



Email us to join our **live Zoom sessions**



Join our facebook group: '**GSC Learning Lab**'



Chat with us on **Facebook Messenger** via the group



Email us directly at **CLDteam@gsc.org.uk**

[glasgowsciencecentre.org](https://glasgowsciencecentre.org)



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