

Science Challenge



Melting glacial ice

Climate change causes variations in both temperature and snowfall. Warming temperatures cause glaciers to melt faster than they can accumulate new ice. Warming temperatures also mean some areas will get rain, rather than snow, further lessening ice accumulation. When glaciers lose more ice in the warmer months than they gain in the colder months, they retreat or recede.

You will need:

- Two identical plastic containers or one divided container
- Ice cubes
- Water (room temperature)
- Food colouring (optional)
- Timer or stopwatch



Image from: <https://pixabay.com/images/id-5760277/>

What to do:

1. Place an equal number of ice cubes in each container. You can use either regular ice cubes or ice cubes made with coloured water. (Colouring makes no difference to melting. It simply makes it easier to see the ice as it melts.
2. Add a small amount of water to one of the containers.
3. Set the timer or stopwatch. Visit the containers every few minutes to see what is happening.
4. Record the time it takes for the ice in each container to melt.

Why ice melts

Changes of state always involve a transfer of energy. Ice melts when heat energy causes the frozen water molecules to move faster. When ice comes into contact with warmer air or water, it absorbs the surrounding energy (heat). The air and water molecules bump against the ice molecules and transfer some of their energy. The increased energy causes the ice molecules to break away, and the water changes state from a solid to a liquid.

Ice melts more quickly in water than air because water is denser – has a greater concentration of molecules – than air. When ice is in water, more molecules bump against it and transfer more heat energy.

Activity from: sciencelearn.org.nz

Technology Challenge



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Floating Garden Challenge

Background: Flooding in Bangladesh

Floods are now affecting over one million people in Bangladesh every year. Due to climate change the rainy season has become longer. It can last up to six months every year. Many families who used to grow crops to feed their families and sell at market are no longer able to do so.

The Challenge:

Your challenge is to design and build a model of a structure that people can grow their crops on, even when their land becomes flooded.



Image from: practicalaction.org

What should you consider? You will need to think about:

- whether you want your model to float and if so, how you can make it do so.
- how to make the top of your model suitable to grow crops on. Does it need to be flat? Layered?
- the size of your model. It needs to be tested by placing it on water in a washing up bowl or sink.
- chickens! In Bangladesh many families keep chickens so maybe your model could help keep chickens safe in floods too!

You will need:

- **Modelling equipment, e.g.**
Plastic drinks bottles, small plastic and polystyrene food trays, straws, K'nex, card, doweling, bubble wrap, cartons, yoghurt pots, lolly pop sticks, corks.
- **Joining and cutting equipment, e.g.**
Sellotape, masking tape, string, plasticine, elastic bands, Blu-Tac, scissors and craft knives **(use with adult supervision)**.
- **Testing equipment**
Washing up basin, sink or bath half-filled with water and weights e.g. tins of food.

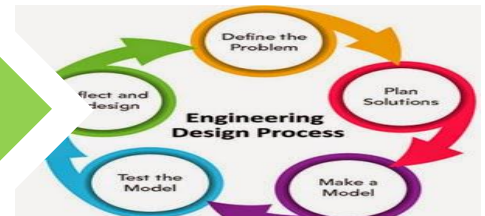
What to do:

- Start by sketching your design ideas before building your model.
- Test that your model floats by placing it in a half-filled washing up bowl.
- Finally, add as much weight to your model as possible until it sinks!

More information and resources for this activity can be found at the Practical Action website:

<https://practicalaction.org/schools/floating-garden-challenge/>

Engineering Challenge

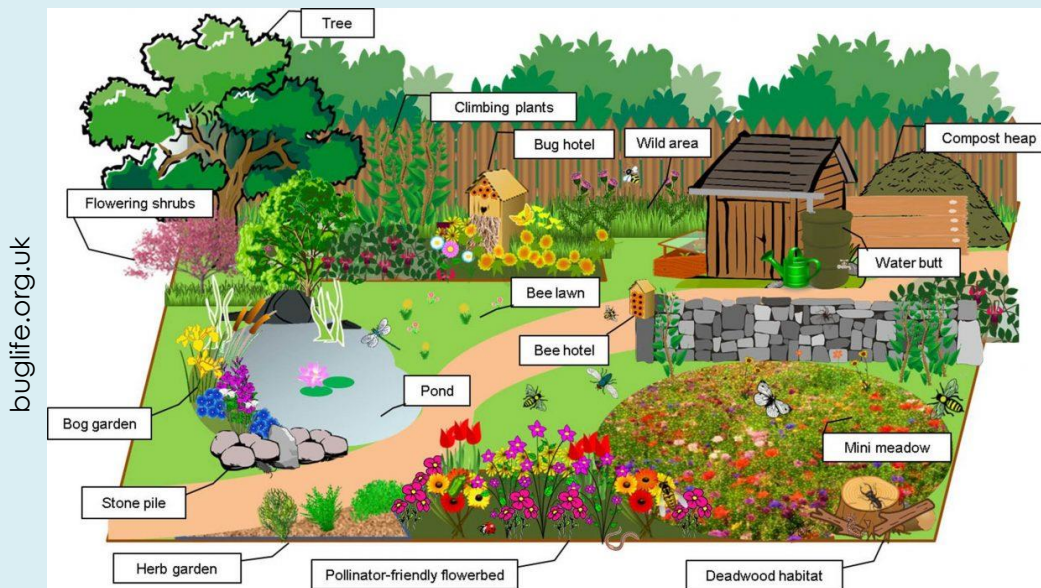


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Climate Change and Animals

Climate change is affecting all living things on earth. We can make changes to the way we live and the way we use the earth's resources. But what do animals do when the world around them changes? Watch the video in the link below...

[Climate Change and Animals](#)



What can we do to help? Firstly, we can look after the wildlife that live in our own environment. In the diagram there are lots of ideas of things that we can do to help insects in our gardens.

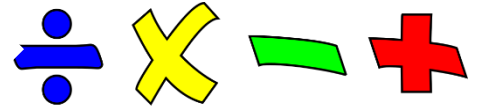
Your task:

Look at the space that you have available at home. It doesn't matter if it is a large garden, a balcony or even a park space. Map and draw the space that you have available. Can you design the space so that it is as bug friendly as possible? Which things can you take action on now? Build any aspects that you can in your space and regularly check your work to see how effective the design and build has been.

Extension:

The diagram shows a water butt which collects rainwater to use in the garden. Can you design and build a device which collects all the rain that we are getting just now? Think about how it will catch the rain and then how you will be able to get the rainwater out to use.

Maths & Numeracy Challenge



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Escaping Frogs

Look at the following problem.

Which problem solving strategy will work best here?

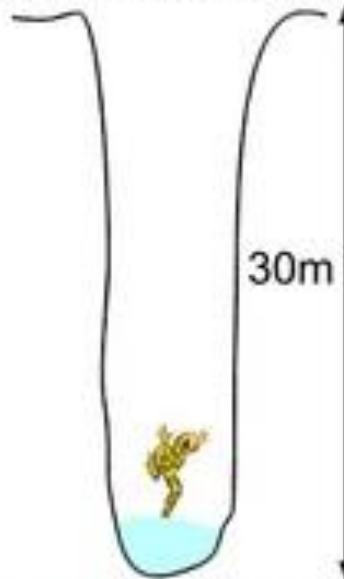
You may wish to draw a diagram or create a table.

Remember to check your answer at the end.

The Jumping Frog

☆ 6

A frog has fallen into a pit that is 30m deep.



**Each day the frog climbs 3m,
but falls back 2m at night.
How many days does it take
for him to escape?**

Literacy Challenge



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Writing a persuasive speech about an environmental issue

A 2018 report encouraged world leaders to make climate change a priority. It said countries needed to work together to limit the rise in temperature rise to 1.5 degrees and stop changes to the planet that would be a catastrophe for life on Earth.

Climate change: What is it and why is everyone talking about it?



Climate change is a complicated issue - but a very important one. Find out more from BBC Newsround: <https://www.bbc.co.uk/newsround/45880633>

What is a speech?

A speech is an informative talk given to an audience.

Find out how to write a speech using this lesson guide from BBC Bitesize: <https://www.bbc.co.uk/bitesize/articles/znvxt39>

Write your speech

Read this article all about the world's top plastic polluters: <https://www.bbc.co.uk/newsround/55218513>

Imagine you are giving a short speech to one of the top plastic polluters from the article. You want to persuade them to use less plastic and make changes more quickly. Use the tips and ideas from the BBC Bitesize lesson to help you write your speech.



Health & Wellbeing Challenge

Where does my food come from?

All food makes a journey from source to consumer. This journey is calculated in food miles.

Food miles

Food miles measure the distance a food has travelled to get to your plate using transport that produces carbon emissions. Food that is grown and produced locally is a more sustainable option for our environment.



Image from: BBC Bitesize

Find out more:

Access the lesson and activities on BBC Bitesize website using this link to find out more:

<https://www.bbc.co.uk/bitesize/topics/z6v94xs/articles/zv3qwnb>

Challenge: Food Diary

Complete a food diary for a week to monitor what you eat. Where possible, look at the ingredients of your meals and find out which country the food has come from. At the end of each day, use an atlas or internet search engine to find out how far the food had to travel to get to you.

You might want to set your diary out like this:

Image from: twinkl

	Breakfast	Lunch	Evening Meal	Food miles for the day
Monday				
Tuesday				
Wednesday				
Thursday				

Social Studies Challenge



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Plastic Oceans

Recently in Dumfries and Galloway, every household has been given recycling bins to help combat the amount of waste we send to landfill. One of these bins collects plastics which cause lots of issues as they do not quickly break down or in some cases, not at all. A lot of these plastics end up in our oceans. Watch the video in the link to see just how big a problem this is...

[Plastic Oceans](#)

Your task:

Using the information in the video clip, can you create a poster, a PowerPoint or any other way you wish, to highlight the facts and figures of pollution in our oceans? Your work should also highlight ways in which we can help combat the pollution and encourage others to recycle and use products with more consideration.

Dreamstime.com



Things to consider:

- Ensure the information is accurate.
- Who does the poster/presentation target?
- Is it eye catching?
- Is the language used persuasive?
- What do you want people to know when they have read or viewed your poster/presentation?

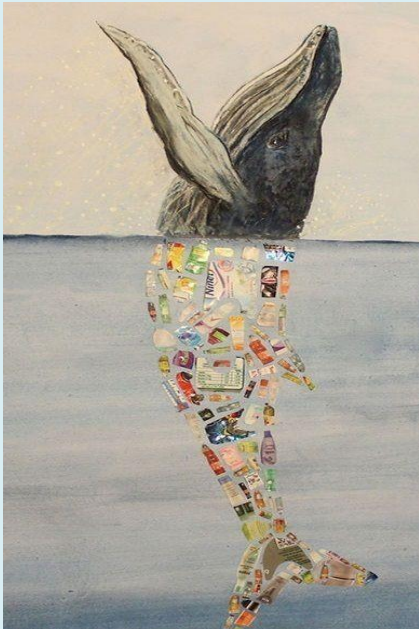
Expressive Arts Challenge



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Painting a better picture!

Art can be used to make people sit up and take notice of problems that we face in the world. These following pieces of art are highlighting the plight of animals which are affected by climate change and pollution in our oceans.



Pinrest.com



Your task:

Can you design and create a piece of art that highlights the issues which will be discussed at the cop26 conference?

[COP26 Glasgow: a guide for kids - National Geographic Kids](https://www.natgeokids.com/uk/2021/09/20/cop26-glasgow-a-guide-for-kids/)
([natgeokids.com](https://www.natgeokids.com))

Look at the key issues being discussed and choose one to highlight in your piece of art. Some of the issues to be discussed include air pollution, climate action, ending plastic pollution and a Just and Green recovery.