Glass Guardians

SUPER INVESTIGATORS INTERACTIVE

Friends of Glass

British Glass

Teacher Notes

Glass Guardians – Super investigators

Introduction

We are very passionate about recycling glass to help protect our planet for current and future generations. Even though glass bottles and jars are 100% recyclable, in 2019 only 71% were recycled in the UK. We want to spread the message about recycling glass as we hope that by 2030, 90% will be recycled.

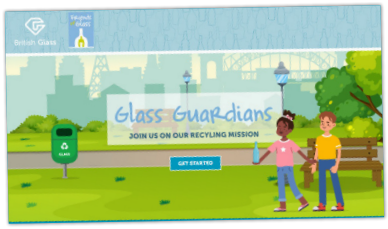
This interactive is aimed at helping children aged 7 – 11 to learn the three main reasons why recycling glass is so important:

- **Saves raw materials such as sand**
- **Reduces harmful CO_2 emissions**
- **Uses less energy**

Using the interactive

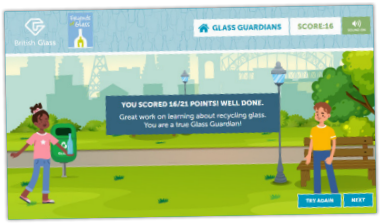
Children will join Sofia and Rushil on a virtual tour of a recycling plant and a factory to learn about the process of recycling glass. They will take part in an online investigation to find out the benefits of using cullet when making glass products. Their investigation will promote scientific skills, in particular predicting and fair testing. The interactive can be used individually or as a whole class. Once the children have completed the interactive, you can help them to take their learning further using the ideas over the page.

Cullet is recycled broken glass that has been separated into different colours and is ready to be used to make new glass jars or bottles. Using it reduces the temperature needed in the process so saves energy.

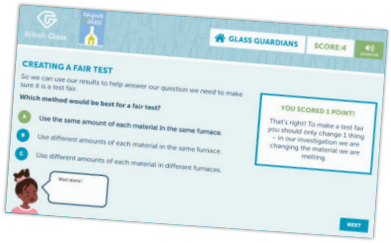


Simple and easy to use design.

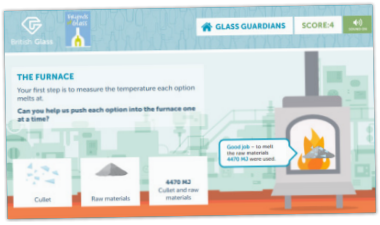
Play with sound on or off.



Gain points and track success.



Plan a fair experiment.



Explore a digital recycling plant.

Access the online experiment here:
https://nationalschoolspartnership.tech/glass-guardians

Climate Change is the heating of our planet. Unfortunately, it is believed that human activity has caused the Earth's temperature to rise about 1˚C since the industrial revolution.

This is having a devastating impact on the planet - it is causing ice caps to melt, weather systems to change and ecosystems to change faster than animals and humans can adapt.

One of the main causes is the burning of fossil fuels as this releases gases into the atmosphere which trap heat from the sun and subsequently warms the Earth. This is often known as the greenhouse effect. One of the main greenhouse gases is carbon dioxide, therefore limiting CO_2 emissions will help protect the planet.

More about glass

Glass is an amazing material that is made from heating up sand, soda ash and limestone to very high temperatures (approximately 1700˚C.) When glass is heated it has a similar structure to liquid, so can be moulded easily by being poured or blown. The glass that is used in packaging such as bottles and jars is 100% recyclable and can be recycled endlessly. To find out more about the properties and uses of glass visit: www.britglass.org.uk/about-glass.

Taking it Further

Hands-on Investigation

In the glass recycling process, a substance called cullet is used. **Cullet** is recycled broken glass that has been separated into different colours and is ready to be used to make new glass jars or bottles. The glass is broken down to increase the surface area making the melting process more efficient and therefore saving energy.

To help your class or child to further understand why glass is broken into smaller pieces for recycling you could get them to do the following: compare dissolving granulated or caster sugar in warm water against dissolving sugar cubes. To keep it a fair test they should also make sure the only thing they change is the sugar. Remember to help them make it a fair test they should dissolve the same weight of sugar in the same volume of water. The water also needs to be the same temperature and they should stir the same amount.

Research

Ask children to monitor the glass in their recycling over a week. They should note down colour and shape (a bottle or jar.) The children could then individually or as a class look into the which colour and shape are most popular. They could also investigate how much energy and CO_2 they have saved by recycling.

Promote the message

Get the children to spread the message about being Glass Guardians – this could be speaking to the school council or creating posters to display around school.

More resources

If you want to help pupils understand more about glass recycling and how to become a Glass Guardian you can find a full suite of resources including teacher notes, classroom presentation and pupil activity sheets here: https://nationalschoolspartnership.com/initiatives/glass-guardians-superinvestigators

Curriculum Links

Specific skills and objectives from the statutory science curricula are listed below:

England: KS2

Skills (working scientifically): including asking questions, fair tests, measuring, record data, present results, draw conclusions.

Year 4: States of matter

- observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)

Year 5: Properties and changes of materials

- give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials
- explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible.

Wales: KS2

Skills: plan, predict, fair test, measure, observe, compare, explain links between cause and effect

The sustainable Earth

- a comparison of the features and properties of some natural and made materials
- how some materials are formed or produced
- a consideration of what waste is and what happens to local waste that can be recycled and that which cannot be recycled.

Northern Ireland: KS2

Skills including: making predictions, making links between cause and effect, justifying methods, opinions and conclusions.

- How waste can be reduced, reused or recycled and how this can be beneficial.
- Changes that occur to everyday substances, for example, when dissolved in water or heated and cooled.

Scotland: Second level

Materials

- By contributing to investigations into familiar changes in substances to produce other substances, I can describe how their characteristics have changed. SCN 2-15a
- I have collaborated in activities which safely demonstrate simple chemical reactions using everyday chemicals. I can show an appreciation of a chemical reaction as being a change in which different materials are made. SCN 2-19a