NAME:

CONSCIOUS CONSUMERS

Climate Change

Workbook

FOOD & FARMING DISCOVERY TRUST

YOUTH STEMM AWARD

saw™ science art writing

The Food and Farming Discovery Trust coordinate and communicate existing food, farming and countryside educational activity in Norfolk.
They also develop new activity and support educators and providers to enhance the learning outcomes for all young people in Norfolk through food, farming and the countryside.

http://discoverytrust.org.uk/

The Science, Art and Writing (SAW) Trust is a science education charity (no.1113386) developed in 2005.
SAW takes a fresh approach to science education, using intriguing images to initiate exploration of scientific research through activities in practical science, creative writing and visual arts, aimed at as wide an audience as possible.

www.sawtrust.org

A skills award to support and inspire the next generation into Science, Technology, Engineering, Maths and Medicine (STEMM).

Students aged 13-19 can register through their school or at home and start working towards a bronze, silver or gold level award. Ask your teacher about how you can get involved or visit our website.

www.ysawards.co.uk

Funded by: Chadacre Agricultural Trust

A fresh look at agricultural science and food

This project aims to start conversations about issues of importance to society by looking at overlapping topics of Food Miles, Plant-Based Diets, Personalised Nutrition, Rewilding, Animal Welfare and Climate change.

There is a lot of information on social media and in the news about these topics but it's often hard to know what to believe when stories seem to contradict each other. These workshops will give you an introduction to some of the key facts and encourage you to look more closely at sources of information available online to determine how reliable they are.

We all have to make choices, particularly around the food we eat and our choices as consumers really do have the power to shape the world we live in.

Following each workshop, we invite you to undertake further research and encourage others to become more Conscious Consumers!

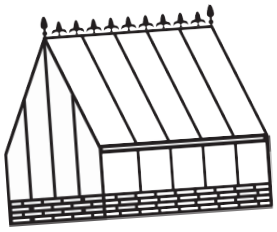
Climate Change

What is Climate Change?

Climate change is the long-term shift of global or regional temperature and weather patterns. Earth's climate has changed many times in its 4.5 billion year history, having gone through multiple ice ages and warming periods.

However, unlike previous changes in the Earth's climate that happened over hundreds of thousands of years, the recent warming trend is happening much faster.

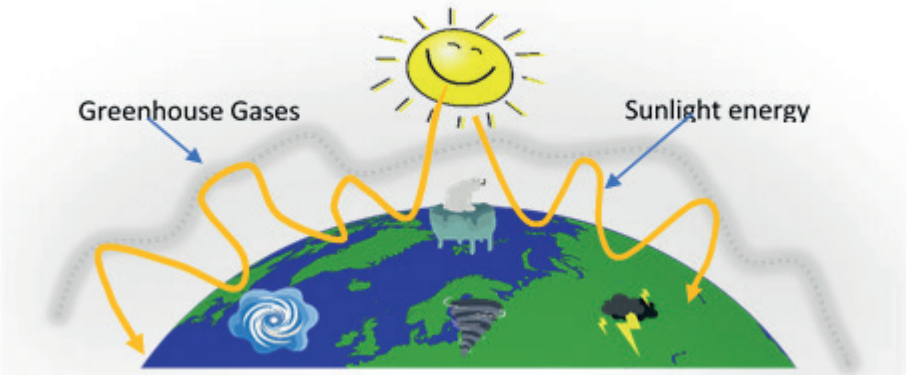
The Greenhouse Effect



You may have heard the term 'Greenhouse Effect' when people talk about climate change? That's because there are similarities in the way a greenhouse traps heat for plant growth from light energy from the sun and in the way gases in our atmosphere trap heat on Earth.

This is why we define some gases as greenhouse gases!

Many greenhouse gases are natural and their presence in the upper atmosphere has enabled the Earth to trap heat energy from the sun to create conditions suitable for life. However, with increasing greenhouse gases in the atmosphere, the Earth absorbs more energy, causing the temperature to rise and the climate to change.



Greenhouse Gases
Where do they come from and how bad are they?

The influence of any greenhouse gas depends on three key factors:

Concentration (PPM) – How much of the gas exists in the atmosphere. Usually measured as Parts Per Million, that is one molecule of that gas in every 1 million molecules of air.

Global Warming Potential (GWP) – The total energy that a gas can absorb over a given time relative to the emissions of 1 ton of carbon dioxide.

Lifetime – How long the gas can remain in the atmosphere (years).

As well as stopping the release of new GHG's, trials are underway to suck excess CO_2 out of the air!

The Five Major Greenhouse Gases

Gas	GWP	Source	Problem
Carbon Dioxide (CO_2)	Low (but there's lots of it ~419ppm)	Burning fossil fuels, deforestation and soil degradation	Not destroyed over time, builds up and remains in the atmosphere for thousands of years
Methane (CH_4)	25 x that of CO_2 Medium (there's less of it ~1892ppb)	Livestock & agricultural practises. Wetlands & decay of organic waste	Food security worries, technology & economy make changing damaging practises slow. Stays in atmosphere for about 10 years
Nitrous Oxide (N_2O)	300 x that of CO_2 High (even less of this ~332ppb)	Produced during industrial & agricultural activity	Stays in the atmosphere for 100 years, dependence on Nitrogen heavy fertilisers for crops
Fluorinated Gases (F-gases)	23,500 x that of CO_2 High to V High (GWP of Sulphur Hex-afluoride shown as an example)	Synthetic gases that contain fluorine used for industrial, commercial & household uses	Common appliances like refrigerators & air conditioning use these. Some F-gases stay in the atmosphere for 3200 years
Water vapour (H_2O)	Variable and linked to the amounts of the other gases	Water cycles naturally from oceans to clouds to rain and back to oceans	Warmer air holds more water and water vapour holds heat creating a positive feedback loop

Modern life has accelerated the emission of greenhouse gases into the atmosphere, and the natural processes that would usually keep natural gases cycling are well out of balance!

We need to:

Work with nature and technology to grow food in a sustainable, non-polluting way.

Remove our dependence on fossil fuels and switch to renewable energy sources.

Create greener transport alternatives for the future.

Find new materials and technologies to build and insulate our homes.

Useful resources

Intergovernmental Panel on Climate Change

An intergovernmental body of the United Nations mandated to provide objective scientific information relevant to understanding human-induced climate change.
https://www.ipcc.ch/

Tyndall Centre YouTube Videos

Good source of information on climate change.

https://www.youtube.com/c/TyndallAcUk/videos

Blue Futures Report

Report produced by the UEA addressing the future of East Anglia's economy, environment and society in the face of climate change.
https://research-portal.uea.ac.uk/en/publications/blue-opportunities-from-the-future-knowledge-and-tools-to-inform-

Activity Sheet One

Climate Change Statements

Look at the statements below. Can you research to find out if they are factual?
Put your detective skills further to the test and unpick where/how the statements came to be.
Don't forget to check out our top tips on selecting your sources of information (slide 12 of the presentation).

If you are working in a group, divide the statements between you but if you are working alone just pick your favourite three to try and myth bust!

1. Polar bear numbers have increased so the ice caps can't be getting smaller!

2. We're heading for another ice age!

3. Living things adapt to their environment, everything will be fine in a warmer climate

4. Carbon dioxide is good for plants so increased amounts will be a good thing!

5. The Earth's climate is always changing, it's natural and nothing to worry about!

6. Scientists don't agree on climate change so how do we know who to believe?

7. Global warming is just a conspiracy so that super powers can make money!

8. We won't need to jet off to Spain for our holiday, it will be nice and hot here!

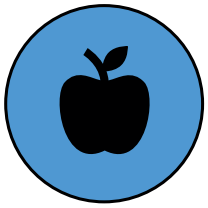
9. It's all happening because of livestock farming, if we all became vegan the climate would stop getting warmer.

Statement	Notes

Conscious Consumers topics

Now you have completed the Climate Change topic, why not try one of the other Conscious Consumers topics!

Food Miles



Personalised Nutrition

Plant-based Diet

Re-wilding

Animal Welfare