

# HOW DO HUMAN ACTIVITIES AFFECT GREENHOUSE GAS EMISSIONS?

KEY STAGE 3 SCIENCE WITH WEST YORKSHIRE BUS ALLIANCE

## Objectives and Links

### ➤ Objectives:

- Investigate the impact of greenhouse gas emissions
- Understand how human activity affects greenhouse gas emissions
- Create a plan to reduce greenhouse gas emissions

### ➤ Curriculum Links:

- **Science – Working Scientifically:** Ask questions and develop a line of enquiry based on observations of the real world
- **Science – Chemistry:** The production of carbon dioxide by human activity and the impact on climate
- **English – Reading:** Reading a wide range of fiction and non-fiction
- **English – Writing:** Summarising and organising material
- **English – Spoken English:** Give short speeches and presentations
- **Maths – Statistics:** Construct and interpret appropriate tables, charts and diagrams
- **Careers links:** Gatsby benchmark 4 – Linking curriculum learning to careers

## About this lesson

This lesson was developed with the West Yorkshire Bus Alliance.

It contextualises students' curriculum learning with insights into local career opportunities. Students will develop skills for exams, everyday life, and the working world.

## Key words

Green economy, carbon neutral, renewable, air pollution, climate change, carbon dioxide, nitrogen dioxide, transport.

## Delivering this lesson

### You will need:

- This Lesson Plan
- Guiding PowerPoint provided

### Students will need:

- Venn Diagram – per pair
- Differentiated Clean Air Graph Task Worksheet – per pair
- Peer Assessment Sheet – per group
- Laptops/tablets – per pair
- Links:

<https://www.bbc.co.uk/bitesize/articles/zwvmdp3>

<https://www.bbc.co.uk/newsround/46295799>

# LESSON SEQUENCE

## Starter Activity

10 mins



**Slide 3:** Begin the lesson with a focus question, **what is climate change?**

Students to discuss the question and share ideas with class. Encourage the discussion of the causes and effects.

**Slide 4:** Introduce the basic concepts of climate change and greenhouse gases. Students work in pairs to complete the **Clean Air Starter Task**. They will need laptops/tablets to research and answer as many questions as possible in seven minutes. *Note: Questions are differentiated by colour: Bronze (LA), Silver (MA), Gold (HA)*

**Slide 5:** Show information from Public Health England looking at air pollution and its affects throughout our lifetime and allow discussion.

**Slide 6:** Show slide which demonstrates the scale of the problem giving more context for the following slides and the main group task further in the session.

## Main Activity

20 mins



**Slide 7:** Share information on the links between transport and the COVID-19 lockdown. Discuss the graph on the slide, focus on key features and what we can learn from the information. Students then work in pairs to complete the differentiated Clean Air Graph Task. They have ten minutes to complete this task.

**Slide 8:** Show the slide and share the challenge facing the West Yorkshire region. In pairs, students draw on their prior and new knowledge to think of ways the region could reduce greenhouse gas emissions.

**Slide 9:** Share the West Yorkshire region's ambition to establish a green economy. In pairs, students watch the **What is Solar Energy?** and **Electric Cars** video clips. In pairs, students complete the Venn diagram to compare their two videos. Encourage students to take turns completing the diagram and to complete the middle section last.

What is Solar Energy?: <https://www.bbc.co.uk/bitesize/articles/zwvmdp3>

Electric Cars: <https://www.bbc.co.uk/newsround/46295799>

**Alternative option:** Read in small groups with teacher/ TA and complete the Venn diagram as a group.

## Group Task

20 mins



**Slides 10 and 11:** Introduce the **Clean Air Advertisement Task** group activity to support Leeds City Council. In groups, students create an advertisement explaining your clean air plan to reduce greenhouse gas emissions like carbon dioxide and nitrogen dioxide. They can create a **PowerPoint, poster, video or live action role play**. Encourage creativity and students to include list of key features (LA, MA and HA) on the slide. Children may choose to include some or all of the suggestions from slide 11 as the basis for their task.

## Plenary

10 mins



**Slide 12:** In groups, students share their **Clean Air Advertisement Task** with the class. Each group listens carefully to the presentation and completes a **Peer Assessment Sheet**.

**Slide 13:** Briefly share the future careers that will be created in a green economy. Students indicate which role they would most like to do. Encourage students to justify their answers.

**Slide 14:** Students to reflect on everything they have learnt in the lesson. Students answer the question, **How can you make a difference now and in the future?** and summarise their thoughts in a tweet.