

THE ENVIRONMENT AND YOU

A LESSON PLAN FOR
KS3 GEOGRAPHY PUPILS



CANARY WHARF
GROUP PLC

THE ENVIRONMENT, SUSTAINABILITY AND YOU

A lesson plan for KS3 Geography pupils

This lesson has been produced by Canary Wharf Group to help Key Stage 3 pupils think about sustainability. The lesson has been designed to be taught within Geography.

Canary Wharf Group has also produced a book for KS3 pupils about sustainability called The Environment and You. If you would like to receive a copy of this book (as a hard copy or pdf), please contact:

Dale Pile, Community Affairs at Canary Wharf Group
dale.pile@CanaryWharf.com

About Canary Wharf Group

Canary Wharf Group plc (CWG) is an integrated property development, investment and management group of companies.

It has achieved one of the greatest feats of civic transformation – developing previously derelict docklands into over 16 million square feet of office, retail and leisure space across its iconic business and shopping district in inner London. Canary Wharf's 35 completed buildings, including three shopping malls, are occupied by some of the world's best companies employing 100,000 people in a diverse range of industries.

Since 2008, Canary Wharf Group has regularly appeared in the Sunday Times list of the UK's Best Green Companies.

Sustainability in Canary Wharf and at our school

Key questions:

- What are the causes and impacts of modern living on the environment?
- How can we manage those impacts?
- What actions can we take with both existing and new buildings to improve sustainability?

Key words:

Environment, Sustainability, Energy, Recycling, Waste, Water, Greywater, Blackwater

Learning Outcomes/Objectives:

- To link local actions to global impacts
- To understand how sustainable practices are applied in an area such as the Canary Wharf Estate
- To understand that sustainability includes economic, social and environmental considerations
- To understand what sustainable actions can be applied to the pupils' own school.

Assessment opportunities

- Pupils study the effect of environmentally-friendly actions at a local, large modern development (Canary Wharf Estate)
- Pupils share ideas and findings about the impact of certain actions upon the environment. They will also feedback their learnings to the rest of the class.

Lesson structure

Starter

Display the definition of “Environment” according to the Oxford English Dictionary:

Environment: *“The natural world, as a whole or in a particular geographical area, especially as affected by human activity”*

Ask the pupils to discuss this definition and whether it sums up their viewpoint. Prompt the pupils to discuss what makes a good or bad environment. It may help to display the homepage of **www.bing.com** that features different, thought-provoking images every day.

Now, as a class, create a spider diagram based around the word “environment”. Teacher sheet 1 has various images that may help prompt the pupils. Encourage discussion of why pupils have chosen the words.

Now display Teacher Sheet 2 that shows a Venn diagram for Sustainability. Briefly, explain what “Economy”, “Society” and “Environment” mean in this context and how true sustainability lies at the intersection of the three sets. A definition of Sustainable Development is also provided on Teacher Sheet 2: *“To meet the needs of the present without compromising the needs of the future”*.

Main task

The pupils will now consider some of the environmental and sustainable practices that have been implemented by Canary Wharf Group.

Split the pupils into mixed ability pairs. Ask each pair to use a large sheet of paper and draw the Society /Environment/ Economy Venn diagram.

Give each pair one of the Worksheets 1, 2 or 3. Ask the pupils to read the sheets together. The worksheets detail some of the environmentally-friendly and sustainable actions that Canary Wharf Group has implemented in recent years. Each worksheet is themed on either energy, recycling or water use.

Ask the pairs of the pupils to consider an area such as Canary Wharf, with offices, shops, restaurants, hotels and so on. What

would they do to ensure that such a development is environmentally-friendly and sustainable?

They should write each idea on a post-it note. These words or phrases can be based on the worksheets or their own knowledge. The pupils should then discuss where they can place the post-it notes on the Venn diagram.

When they have finished the task, ask each pair to join two other differently themed pairs to form one large group. Each group should now be covering all three areas of energy, recycling and water use. Each pair shares with their group what they have learned. They then work together to place all their post-it notes on one Venn diagram (they may need to redraw the diagram on a new sheet of paper to fit all the post-it notes).

Initiate a short class discussion about the actions the pupils suggested. Are there any actions Canary Wharf Group has taken that surprised the pupils? Encourage the pupils to discuss social, economic and environmental considerations.

Plenary/come back

Working on their own, pupils use Worksheet 4 to think of ways their school's sustainability can be improved. The pupils should try to relate their answers to social, economic and environmental factors.

Differentiation

- Ensure pairs are of mixed ability
- For the plenary, less able pupils can be provided with Worksheet 5, which has some answers already completed
- More able pupils can also write a letter to a local councillor, asking the council to implement a sustainable action in the area. The letter must explain why possible benefits outweigh any disadvantages.

Homework

Pupils to examine their own home and consider what steps could be taken to improve sustainability. They should produce an annotated drawing of their home, detailing at least five areas of potential improvement.

Additional task 1 (if required)

Working in pairs, each pupil writes down four environmental or sustainability facts, one of which is untrue. One pupil reads out the four “facts” to the other pupil who has to say which one is untrue. After the untrue statement has been revealed, the pupils swap roles. When completed, pupils can swap partners to create new pairs and begin again.

Additional task 2 (if required)

Using role play and working in pairs, one pupil will “pitch” an idea of how to improve sustainability at the school. The other pupil will play the role of head teacher. The aim is to convince the “head teacher” to implement the suggestion.

Pupils should consider the environmental, social and economic implications, and use these in their argument. Each “pitch” should take three minutes. When the time is up, the pupils swap roles.

Notes on the National Curriculum

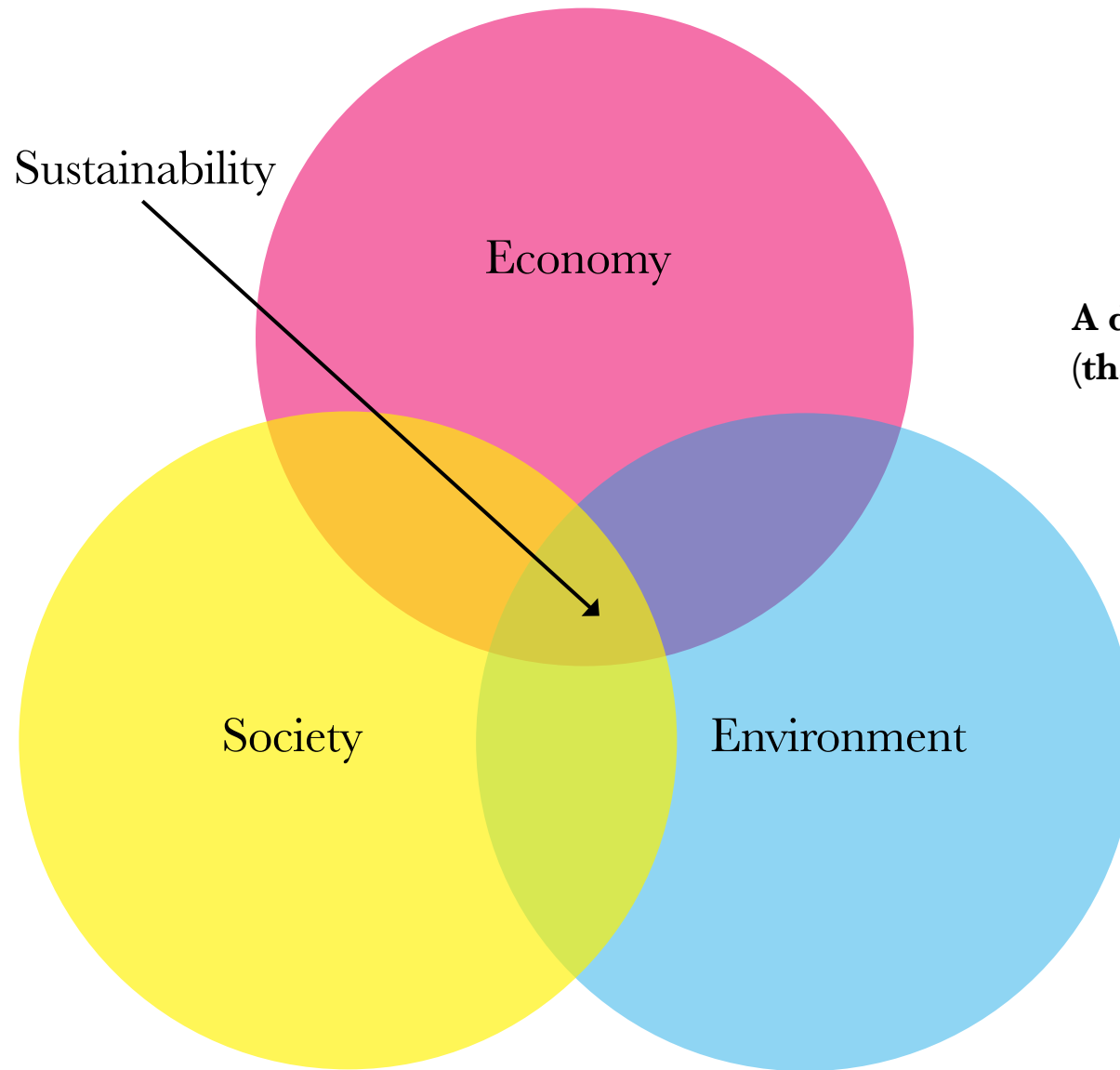
The national curriculum programme of study for Geography at KS3 was disappplied from 1 September 2013 and is no longer statutory. Schools are still required to teach the relevant subjects, but have the freedom to adjust their curriculum to help prepare for the introduction of the new national curriculum from September 2014.



Teacher sheet 1– Images from Canary Wharf Estate



Teacher sheet 2 – Venn diagram showing Sustainability



**A definition of Sustainable Development
(that is, building in a sustainable way):**

*“To meet the needs of
the present without
compromising the needs
of the future”*

Pupil worksheet 1 – Energy

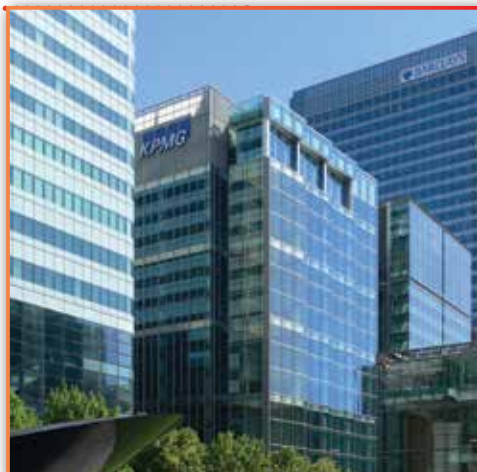
Name

About three-quarters of the UK's electricity is produced by burning fossil fuels (such as gas, coal and oil) to drive electricity generating turbines. However, when fossil fuels are burned, they release carbon dioxide (CO₂) into the atmosphere. And that CO₂ is thought

to be one of the main causes of climate change. So, the more fossil-fuel derived electricity we use, the greater the climate change problem becomes. That's why it is a good idea to reduce energy consumption – it reduces CO₂ emissions. Plus, it saves money.

POWER UP!

Normally, electricity is generated miles away at a power station and huge amounts are lost on the way, (known as transmission losses). But at Canary Wharf's KPMG building (right), electricity is generated within the building. By having a power plant in the building, transmission losses are tiny. The power plant produces electricity, and then re-uses any extra energy released during power generation to heat and cool the building – all at the same time. This process is called trigeneration.



FEEL THE HEAT

One Canada Square, the most famous building in Canary Wharf, was built in 1991. Since then, there have been major technological improvements. For example, the old electric heating system has been replaced by a high-efficiency, gas, hot water heating system. That has reduced carbon emissions enormously.



LIGHTS OUT

Many of Canary Wharf's offices use lighting systems with movement sensors. If nothing moves for a while, the lights are turned out. In areas such as stairwells, the lighting only turns on when someone uses the stairs.

BRIGHT IDEA

One way to use less electricity is to be more energy efficient: that is, use less energy to do the same thing. For example, only use low-energy light bulbs.

Pupil worksheet 2 – Recycling and waste

Name

When we're finished with something, we throw it away. This is known as "waste". But, did you know about two-thirds of waste in UK household's can be recycled? Most waste is buried in huge landfill sites. These sites can release methane gas which is believed to be one

of the biggest contributors to climate change. Not only this, but landfill sites get full. What happens when we run out of space? That's why we all need to think about how we dispose of unwanted materials and maximise what we reuse and what we recycle.

THE THREE R'S



When considering recycling, there are three key factors to think about.

REDUCE

Reduce the amount of waste created in the first place by choosing carefully the goods you use.

REUSE

Lots of items used every day can be reused for other purposes. Before throwing something away, we should think how it could be reused.

RECYCLE

This involves processing used materials into new products. For example, a newspaper can be pulped down and made into new paper.



OIL WASTE

Oil used in Canary Wharf's kitchens and restaurants is collected and taken to an industrial plant where it is made into biofuel. This fuel can then be used in diesel vehicles. Other food waste, as well as garden waste, is also recycled to make compost that can be used to help grow plants.

RECYCLING

Canary Wharf Group uses closed loop recycling. This means that if a sheet of paper is correctly recycled, it will eventually

be turned back into paper which can be used once again.

In all Canary Wharf Estate offices, there are two bins – one is for dry waste (paper and plastics that can be recycled) and one for residual waste (that can't be recycled).



FACT!

The UK produces enough rubbish every week to fill Wembley Stadium!

Pupil worksheet 3 – Water use

Name

Life on Earth can't survive without water. We use it every day – from drinking and washing to watering crops and manufacturing products. Total water usage in the UK amounts to over 4600 litres of water per person a day. That's enough to fill 58 bathtubs.

The amount of carbon dioxide (and similar gases) each of us adds to the atmosphere through

all our activities (including eating, clothing, travelling etc) is called our carbon footprint. About one fifth of a household's carbon footprint comes just from heating water for baths, showers and washing up. And if everyone in the UK cut one minute off their shower, it would save 1420 million litres of water a year.

GREY TO BLACK

Water that has been affected by human activity is known as wastewater. It comes from showers, basins, baths, dishwashers and, of course, toilets! It can also come from industrial processes. Different types of wastewater have to be dealt with in different ways. Two types of wastewater are:

Greywater, otherwise known as washwater. It comes from baths, taps, washing machines and other home appliances.

Blackwater, otherwise known as sewage. In other words, the water generated from the toilet after it has been flushed.

FEELING FLUSH

The Canary Wharf Group installs special waterless urinals in men's loos that only flush through fully when it is ecologically friendly to do so. The toilets also initially flush on a sensory basis and detect movement before flushing any waste away!



FACT!

A leaking tap can waste up to 15 litres of water a day. That's around one and a half buckets' worth.

GO WITH THE FLOW

Greywater is normally easier to treat than blackwater as it contains lower levels of contamination. Greywater can often be recycled directly in many homes. For example, greywater from a bath can be used to water the garden.

Where recycling is not possible, greywater and blackwater exit the house through the sewer and are pumped to water treatment works where they are cleaned and filtered, ready to be used by us all over again.

Canary Wharf Group makes the best use of its greywater waste. Special machinery, such as this processing plant in the KPMG building (right), cleans the water so that it can be reused for such things as flushing toilets.



Pupil worksheet 4

Improving sustainability at my school

Name

Consider your school. What could be done to make it more sustainable? Write three actions below. Don't forget to show how you have considered social, economic and environmental factors.

For example: Saving energy is a sustainable action because **creating an energy supply usually requires the burning of fossil fuels such as oil or gas.**

One way we could save energy at our school is to **install motion-sensor lighting systems that only turn on lights when someone moves. Thus, lights would only be switched on when they are needed.**

This would improve sustainability because **it would save energy, as well as reduce our use of fossil fuels. It would also provide an economic benefit through reduced energy bills.**

ACTION 1 ENERGY

Saving energy is a sustainable action because

.....

One way we could save energy at our school is to

.....

This would improve sustainability because

.....

ACTION 2 RECYCLING AND WASTE

Reducing waste and increasing recycling is a sustainable action because

.....

One way we could reduce waste and increase recycling at our school is to

.....

This would improve sustainability because

.....

ACTION 3 WATER USE

Reducing water use is a sustainable action because

.....

One way we could reduce water use at our school is to

.....

This would improve sustainability because

.....

Pupil worksheet 5

Improving sustainability at my school

Name

Consider your school. What could be done to make it more sustainable? Write three actions below. Don't forget to show how you have considered social, economic and environmental factors.

For example, saving energy is a sustainable action because **creating an energy supply usually requires the burning of fossil fuels such as oil or gas.**

One way we could save energy at our school is to **install motion-sensor lighting systems that only turn on lights when someone moves. Thus, lights would only be switched on when they are needed.**

This would improve sustainability because **it would save energy, as well as reduce our use of fossil fuels. It would also provide an economic benefit through reduced energy bills.**

ACTION 1 ENERGY

Saving energy is a sustainable action because

One way we could save energy at our school is to **install energy saving devices such as low energy lightbulbs.**

This would improve sustainability because

..... **This would not only save energy, it could also provide an economic benefit.**

ACTION 2 RECYCLING AND WASTE

Reducing waste and increasing recycling is a sustainable action because **it ensures the earth's resources are used more efficiently. It also cuts down on the release of harmful greenhouse gases such as methane.**

One way we could reduce waste and increase recycling at our school is to

This would improve sustainability because **by reducing the amount of waste the school produces we will use the school's resources more efficiently. It will provide a social benefit to the school, its pupils and the local area.**

ACTION 3 WATER USE

Reducing water use is a sustainable action because

One way we could reduce water use at our school is to **ensure there are no leaking taps.**

This would improve sustainability **because it takes energy and costs money to ensure we have clean water to use and drink. By reducing water use, we can improve sustainability in both an environmental and.....manner.**