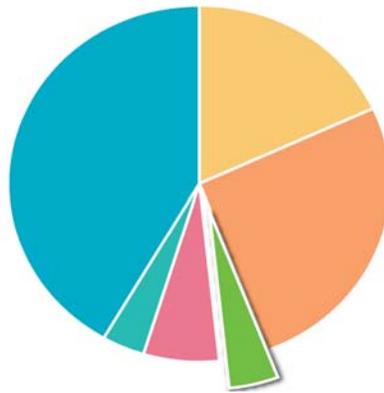


Environment



Introduction

Spending on the environment includes sustainable development, food, farming and fisheries, animal health and welfare, environmental protection, pollution control and rural communities.



Budget 2013-14:
£23 billion
*(Source: HM Treasury
 March 2013)*

Learning objectives

- To understand the economic consequences of environmental disasters such as flooding;
- To understand some prevention and protection measures relating to flooding.

Learning outcomes

- **All must** know some costs and consequences of flooding;
- **Most will** understand who is responsible for different costs associated with flooding;
- **Some could** explain solutions that aim to prevent and protect against future flooding; taking factors such as cost, responsibility and effectiveness into account.

Curricula references at Key Stage 4

Citizenship: 11.1 b; 1.2 a, b, c; 2.1 a; 2.2 a, b; 3 a, i, j, k, n; 4 a, b, g, h.
 PSHEe (EWFC): 1.2 d; 1.3 a; 1.4a, b; 2.3 i; 2.4 b, d; 3k.

Resources

Item	PDF	Presentation slide
What's Happening	Page 5	✓
BBC News Floods 2007 Coverage		✓
Flooding in 2007 in the UK		✓
What Costs? Who Pays?	Page 6	✓
Consequences & Costs of Flooding	Page 7	
Finding & Funding a Solution	Pages 8-9	✓

Lesson Sequence

Starter (10 mins)

- Show the students the photograph of a car in the flooded in **What's Happening?** (p 5) which is also on the lesson plan presentation slides. The photo is of severe flooding in the UK in 2007. Ask:
 - *What's happening in this picture?*
 - *Where do you think this happened?*
 - *What effects might this have had? (encourage them to think about economic, social and environmental impacts)*
- Give students some further information about the devastating effects of flooding by showing them the news coverage in the lesson plan presentation slides;
- Explain that the students are now going to consider the financial consequences of flooding on individuals, business and the economy.

Main (35 mins)

- Organise the students into pairs or small groups and give each group a copy of **What Costs? Who Pays?** (p 6) which contains two photographs from the flooding in 2007;
- If appropriate, you can search on Google images www.images.google.com for alternative photographs that relate to your local area;
- Ask the students to look at the photographs and write around them all the consequences of the flooding. **Consequences and Costs of Flooding** (p 7) provides some answers which you can use as prompts depending on how much help the students need. They should consider short, medium and long term impacts;
- When they have generated as many consequences as possible, ask the students to identify which consequences have a financial cost and write underneath each one who they think will pay these costs. These might include:
 - individuals and households
 - insurance companies
 - local council and government
 - businesses
 - charities
- Go over the key facts **Economic Costs of UK 2007 Flooding** in the lesson plan presentation slides. These explain the financial impact of the floods;
- Now ask the students for their ideas about why the flooding occurred. Their suggestions might include:
 - rain
 - lack of flood defences
 - climate change
 - buildings being on flood plains

Lesson Sequence (cont..)

- Explain that you now want the students to consider different ways of preventing future flooding. **Finding and Funding a Solution** (pg 8 - 9) contains a range of potential solutions, some of which focus on protection against floods, while others aim to halt climate change. For each solution they will need to consider the:

- cost
- timescale
- impact

- Organise the students into pairs or small groups. Give each group a copy of **Finding and Funding a Solution**. They need to circle their answers for each solution.

Plenary (10 mins)

- Take some feedback from the students about their answers to **Finding and Funding a Solution**. These questions are included in the lesson plan presentation slides. Ask:

- *Do you think it is more effective to try to protect against damage caused by flooding, (eg flood defences) or invest in measures that aim (but do not guarantee) to prevent flooding happening in the future (eg reducing CO2 emissions)?*
- *If flooding is caused by climate change, who is responsible for tackling climate change – individuals or the Government?*
- *Households and businesses in areas of high flood risk have to pay much higher insurance premiums than those in areas of low risk. Some cannot get insurance at all. Is this fair?*
- *Should new houses be built near to or on flood plains? Where else should they be built if not?*
- *Do advertising campaigns and education change people's behaviour?*

Further/additional activities

- The links below are included in the lesson plan presentation slides:

- Students play the flood prevention simulation game at www.floodsim.com. This game simulates the decisions that government have to make when trying to reduce the economic impact of flooding. Students use a budget to plan three years of flood prevention. The game then simulates how successful they have been;

- Ask the students to compare and contrast the information in the following articles and write a script for a TV presenter, reporting from the scene of a flood, that provides a balance of both views.

- *global warming may not have been the cause 2007 UK floods*
<http://news.bbc.co.uk/1/hi/sci/tech/7287988.stm>

- *global warming was the cause 2007 UK floods*
<http://www.guardian.co.uk/environment/2011/feb/16/climate-change-risk-uk-floods>

- Ask students to consider the three statements in the following table. They can be tasked to research information that supports arguments for and against.

Everybody pays when there is an environmental disaster

Although insurers, councils and government often pay much of the costs, where does that money come from?

Households should be fined if they don't recycle

Recycling was made compulsory in the London Borough of Brent in 2008:
<http://www.recycle.co.uk/news/842000.html>

These two online games can also give students ideas to work with:

- 'Wasted' from the Science Museum
<http://www.sciencemuseum.org.uk/onlinestuff/games/wasted.aspx>
- 'Dumptown' from Recycle City
<http://www.epa.gov/recyclecity>

Environmental disasters should be paid for by the countries that cause them

- In December 2010 toxic red sludge from a spill at an industrial plant in Hungary reached the River Danube, forcing countries downstream from Hungary, including Croatia, Serbia and Romania, to draw up emergency plans: <http://www.bbc.co.uk/news/world-europe-11491412>
- Climate change is an issue of international concern. The Kyoto Protocol is an agreement by a large number of countries to cut their greenhouse gas emissions in an attempt to halt climate change. One notable exception to the agreement is the United States
- This online game from the BBC puts students in the role of the President of EU trying to fight climate change: http://www.bbc.co.uk/sn/hottopics/climatechange/climate_challenge/

What's Happening?



What Costs? Who Pays?



**Damage to roads -
needs to be rebuilt**

Consequences & Costs of Flooding

	Environmental costs	Economic costs	Social costs
Short term (at the time and in the following few weeks)	<ul style="list-style-type: none"> Animals and plants die Habitats destroyed Trees fall Reservoirs and rivers are polluted by sewage Fields, parks and gardens covered in mud and sewage 	<ul style="list-style-type: none"> Property and belongings are destroyed Loss of earnings as people can't get to work Businesses' stock is damaged Loss of business as people can't get to shops Need for increased emergency services Road and rail impassable, public transport stops Agricultural crops damaged Temporary housing for those that have lost their homes Power supplies (electricity/gas) damaged 	<ul style="list-style-type: none"> People can't get to work or school Injury or loss of life Health risks due to lack of food and clean water Loss of homes, possessions, businesses People have to live in temporary accommodation Worry about friends and family Pets lost, injured or die People stranded and in need of rescue
Medium term (over the next few years)	<ul style="list-style-type: none"> Further destructive flooding Slow recovery of green areas like parks Animals, birds and insects displaced to other areas Trees and plants can't recover and die slowly 	<ul style="list-style-type: none"> Insurance companies pay out massive amounts in claims by householders and businesses Householders and businesses cover the cost of uninsured damage Increases in insurance premiums and council tax to cover damage and restore public services Businesses go bankrupt due to damages and loss of trade Local council and government spend money repairing roads, schools and other public services House prices fall as no-one wants to move into the area 	<ul style="list-style-type: none"> Loss of jobs as businesses go bankrupt Households get into debt due to cost of damage, increasing insurance and council tax People continue to live in temporary accommodation like caravans until their homes are repaired People want to move away to other areas
Long term (in 50 years)	<ul style="list-style-type: none"> Possible extinction of some species as their natural habitats are destroyed Green spaces like parks disappear because they are continually damaged by flooding Water is unsafe to drink due to pollution and disease 	<ul style="list-style-type: none"> Large amounts of money are spent on flood defenses No businesses left in the area due to flood risk Buildings are left damaged as there is no money to repair them 	<ul style="list-style-type: none"> Most people move away from the area People who can't move away live in poor conditions

Finding & Funding a Solution

<p>Sandbags provided for all homes and businesses at risk of flooding.</p> <p><i>Sandbags can be used to prevent water getting into houses.</i></p>	Cost	Low	Medium	High
	Timescale	Short	Medium	Long
	Impact	Low	Medium	High

<p>Large scale barriers to protect urban areas.</p> <p><i>The cost of a scheme to protect Leeds centre, which would need 18 miles of defences to be built along the River Aire, has been put at more than £75m.</i></p>	Cost	Low	Medium	High
	Timescale	Short	Medium	Long
	Impact	Low	Medium	High

<p>Plant trees in areas of high risk areas.</p> <p><i>Trees help prevent flooding by intercepting rainfall slowing the time it takes to reach urban areas. They also absorb water from soil and carbon dioxide from the air.</i></p>	Cost	Low	Medium	High
	Timescale	Short	Medium	Long
	Impact	Low	Medium	High

<p>Prevent further building on floodplains in the countryside.</p> <p><i>The UK suffers from not having enough housing. However building on floodplains increases flood risk as water is not absorbed into the earth and these houses are much more likely to be flooded.</i></p>	Cost	Low	Medium	High
	Timescale	Short	Medium	Long
	Impact	Low	Medium	High

<p>Replace the UK's ageing drainage systems.</p> <p><i>Many UK drainage systems date back to Victorian times and cannot cope with the volume of water going through them. This increases flood risk at times of heavy rain.</i></p>	Cost	Low	Medium	High
	Timescale	Short	Medium	Long
	Impact	Low	Medium	High

<p>Place a further tax on the price of gas and electricity to encourage people and businesses to use less.</p> <p><i>Reducing fuel consumption will reduce CO₂ emissions with the intention of halting climate change.</i></p>	Cost	Low	Medium	High
	Timescale	Short	Medium	Long
	Impact	Low	Medium	High

<p>Require by law all companies and households to recycle all waste products.</p> <p><i>Recycling means less energy is consumed in producing new goods. Therefore reducing CO₂ emissions and climate change</i></p>	Cost	Low	Medium	High
	Timescale	Short	Medium	Long
	Impact	Low	Medium	High

<p>Increase investment in public transport to encourage people to rely less on cars.</p> <p><i>This will reduce CO₂ emissions with the intention of halting climate change.</i></p>	Cost	Low	Medium	High
	Timescale	Short	Medium	Long
	Impact	Low	Medium	High

<p>A national advertising campaign on reducing fuel consumption explaining the consequences of climate change and flooding.</p> <p><i>Raising awareness will help to make people aware of the impact of their actions.</i></p>	Cost	Low	Medium	High
	Timescale	Short	Medium	Long
	Impact	Low	Medium	High

<p>Make education on the causes and consequences of climate change statutory in primary and secondary schools.</p> <p><i>By making children aware of the issues it may make the change in behaviour required easier.</i></p>	Cost	Low	Medium	High
	Timescale	Short	Medium	Long
	Impact	Low	Medium	High