This unit of work helps students develop their skills in both Geography and Citizenship by looking at flooding. The unit focuses on the complexity of evaluating choice in relation to the interaction between people and the environment.

Flooding is on the political agenda, and it impacts on all of us either directly or indirectly. It often results from human mismanagement of the environment. Arguably those involved in the decision-making process have made and continue to make flawed value judgements, whether in central government, local government, environment agency, local planners and developers, or pressure groups.

Rationale

- Citizenship in relation to geography focuses on the impact of our actions in the ‘here and now.’
- Students are more likely to be engaged if their classroom learning relates to immediate events.
- Immediate events enable students to have relevant and specific prior knowledge.

Overview

Four flexible lessons for all year groups in key stage 3 who may or may not have studied rivers, the hydrological cycle or flooding before. The unit is will be most effective when there has been local flooding, or floods are in the news.

Students will develop an understanding of how the behaviour of both groups and individuals impacts on the environment. The aim is to challenge the decision-making process not at its outcomes (the decisions that have been made) but at its start point (what is being decided upon). Shouldn’t sensible citizens be asking “what can we do to prevent flooding?” rather than “what can we do to protect ourselves from flooding?”

The unit is an enquiry sequence based on the question “Are floods an act of God?” The question is not to be taken literally but seen as a representation of the perception of floods that is often portrayed in the media.
Taking the Boscastle floods of August 2004 as an example, The Guardian of 18 Aug 2004, pp 4 quotes a witness as saying “After the rain I looked up and said ‘Thank you Lord for looking after us’ and it hasn’t rained since,” and then goes on to comment that the flood was of biblical intensity and that such events are “nature’s freak show …… [that] depend on the lottery of rainfall and the accident of landscape.”

The challenge of this enquiry is to develop a less simplistic and more informed response from students founded on the key principles of Citizenship, that is that knowledge and understanding about becoming informed citizens is acquired and applied through the development of skills of enquiry and communication, and participation and responsible action.

Lesson 1
Why did Mrs McCormack’s business disappear down the river?

Students will learn:
• about a topical environmental issue (floods);
• about the connections between human activities and flooding;
• to use their imagination to consider other people’s experiences;
• to analyse written information;
• to make links between cause and effect;
• to think about taking responsibility for our actions;
• to develop enquiry skills.

Starter

1 Start this lesson with some high impact images of flooding to engage the students. It could be a short video-clip, a powerpoint presentation, or a set of photos.

A range of images of Boscastle from the BBC website are referenced in this activity. The BBC website generally has images of local or current examples. Here are the photos of the Boscastle flood of 2004.
http://www.bbc.co.uk/cornwall/content/image_galleries/boscastlefloods2004_gallery.shtml

2 Ask students what the images show.
• What has or may happen to objects and people in the image.
• What caused the events portrayed in the image?
3 Pose the question: “Are floods an act of God?” explaining that this is not to be taken literally but to mean ‘Are floods unavoidable/uncontrollable natural events?’

Students have 5 minutes to write their responses, which are then sealed in an envelope and handed in.

4 Explain the rationale of the unit.

“Using the example of floods, we are going to consider how the behaviour of individuals and groups of people impacts on the environment, and how changes to people’s behaviour could affect the future of our environment.”

Students must appreciate the bigger picture from the outset if the enquiry is to be effective. This is the key question to be tackled over the next four lessons. At the end of the lessons students will unseal their envelopes and consider whether they have changed their minds.

Main activity

Photocopy Resource sheet 1 ‘Why did Mrs McCormack’s tea-rooms disappear down the river on 18 August?’ for the class, or show it on a whiteboard. You may want to adapt this fictional account to the flood event you are using.

Cut out the statements and put each set into an envelope.

1 Divide the class into pairs or small groups and hand out the envelopes.

2 Students use the statements from the envelope to solve the mystery of Mrs McCormack’s tea-rooms.

3 There is no right or wrong answer. Look for the quality of synthesis of information; what is the implication of each statement and how does it help to solve the mystery? Success depends on co-operative group work in which productive learning and social relationships are fostered.

You can extend the activity with further questions.


Plenary

Photocopy Resource sheet 2 ‘Flood disaster’ for the class, or show it on a whiteboard. This implies that floods are naturally occurring events which are not disastrous without human interaction. Only when floods and humans interact will a human disaster occur.

Using information from this lesson, suggest what has brought people into contact with floods, and how their behaviour accentuated the risk of flood disasters. This could be finished for homework, with students annotating their own copies of Resource sheet 2.
Lesson 2  How can we protect ourselves?

**Students will learn:**
- about flood protection and prevention strategies
- about different points of view on flood management
- to develop empathy for others
- to assess different viewpoints
- to detect bias
- to develop strategies for tackling conflict
- to develop a willingness
- to develop empathy for others
- to assess different viewpoints
- to detect bias
- to develop strategies for tackling conflict
- to develop a willingness to participate in group and class discussion
- to present a reasoned case and justify opinions
- to negotiate responsibly
- to develop enquiry skills.

**Starter**

Ask students to make a list of ways of protecting places from flooding. Hopefully this will include hard-engineering as well as sustainable solutions. Ask them if they had to choose one means of protection for their own homes what would it be?

Give the class 5 minutes to discuss this in small groups and try to come to an agreement. This will give students an insight into the difficulties of reaching agreement with others over a decision that could impact on them personally.

**Main activity**

1. Provide students with Resource sheets 3 ‘How can we protect ourselves?’ and 4 ‘Interest groups’.

2. Role-play based on the question ‘How can we protect ourselves?’

Students study the issues of flood management as outlined on Resource sheet 3, and consider each of the options proposed.
Divided the class into groups of four and allocate each member an interest group role from Resource sheet 4.

Groups then decide which option for flood management should be chosen. Each role has a separate agenda so reaching a decision should be problematic.

3 Each group then feeds back their decision to the class and briefly explains how it was reached, outlining particular stumbling blocks they encountered.

**Plenary**

Write the following quote on the board: “You can’t please all of the people all of the time, but you can please some of the people some of the time.”

Ask students how accurately this portrays their discussions today. How this could relate to the problem of flooding? What does this mean for us as sensible citizens?

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**Lesson 3 Will flood prevention be approved?**

**Students will learn:**

- about the interaction of value judgements and geographical evidence
- to analyse a range of viewpoints
- to develop empathy with others
- to recognise and challenge biased opinions
- to develop a sense of justice
- to compromise
- an awareness that our actions have consequences
- to develop enquiry skills.

**Starter**

Give students 5 minutes to write about something that they consider to be very important in their lives.

When the time is up the teacher needs to collect in all the paper and then blatantly when the students are all watching, tear it all up and throw it in the bin. This should provoke a reaction!

Ask students how they feel. Most will probably be angry or annoyed. Now explain that the reason you did this was to give then an understanding of the frustration that some must feel when their views are ignored, dismissed or discarded. Many people believe that their views about floods are not being heard or listened to!
Main activity

Give students access to Resource sheet 5 ‘Different points of view’.

1 Explain to students that reaching a decision on flood management, as they did last lesson, is not the end of the decision-making process. Proposals have to go before local, county, regional and national councils and committees, and need to be approved at each stage. This process can be long, tedious and very frustrating for those involved, particularly if the local community is in disagreement. You will be able to draw on a multitude of examples!

2 Consider the decision reached last lesson to work out just how problematic it would be to push our proposal through.

3 Divide students into small groups. Give each group a copy of Resource 5 and ask them to study the viewpoints outlined. They must decide which viewpoints are likely to agree/disagree with our flood management proposal. Students then need to consider why different views are going to make introducing our proposal more difficult. Finally, they need to consider how viewpoints could be altered and think about compromises that could be made.

Plenary

Pose the question ‘will the flood prevention proposal be approved?’ – take a show of hands from the room; ask how long students think the full approval process will take. Provide them with examples of schemes introduced locally, nationally or internationally – from the Narmada Dam Project to the Lynmouth flood alleviation scheme – and outline associated approval problems such as conflicts of interest, and give a time scale for the introduction of the schemes.

Lesson 4 Is flooding set to continue?

Students will learn:

• to reflect on what they have learnt and to communicate their findings
• to justify their personal opinions
• about the concept of sustainability
• how thinking about the future can guide decision-making
• to develop a belief that things can get better and that individuals can make a difference.

Starter

Students open the envelope from the first lesson and to consider their responses to the question ‘Are floods an act of God?’ In groups students need to spend 5 minutes discussing how their views may or may not have altered over the last few lessons. This is an important stepping stone into the main activity.
Main activity

Working in small groups students are to prepare a short presentation entitled ‘Possible Futures’. They need to consider the flood scenario that the teacher has drawn upon in the previous lessons, and use the knowledge and understanding they have developed during the unit to imagine how the issue of floods, aligned to a specific area or nationally or globally, will develop over the next 10-20 years.

- Will severe floods become more common?
- Will people continue to put themselves at risk from floods?
- Will humans continue to battle against nature?
- Will there be a more sustainable future?

Teachers may want to provide students with outline maps of particular river basins, these could be annotated to identify and locate the events of students’ ‘Possible Futures’.

When completed a spokesperson from each group needs to display and present their ‘Possible Futures’ to the rest of the class.

Plenary

This needs to be a summary and evaluation of the unit and ought to focus around the following questions:

Why is flooding society’s responsibility?
Can the conflicting views of different people/groups of people be resolved?
Is there one best solution to flooding?
What limits society’s ability to make the ‘right’ decisions about flood management?

Taking it that important step further …

Beyond the four lessons, where practically possible, it is important that students ‘do something’ with what they have learnt. Effective school citizenship only takes place when students share their learning with audiences beyond the classroom; this can be within the school, their local, national or global communities.

For example:

Write articles for the school or local newspaper relating to their ‘Possible Futures.’

Prepare a flood prevention display for the school building or local council office.

Write letters making recommendations to MPs, local councillors or the European Parliament.
Use video link to discuss/debate your concerns about flooding with other local schools or perhaps go global and hold a forum with schools overseas (there are plenty of schools in Mississippi who are keen to make contact with UK schools).

**Useful resources:**

(Excellent guidance, support and strategies for holding classroom discussions and organising co-operative group work.)

(Provides guidance on creating/adapting mysteries, ref: Lesson 1.)

(Useful information on flooding with a strong citizenship slant.)

(Chapter 15 focuses on “futures” enquiry, ref: Lesson 4.)

http://www.fema.gov/business/guide/section3c.shtm
http://floodobservatory.colorado.edu/Archives/index.html
http://news.bbc.co.uk
www.environment-agency.gov.uk
www.floodsmart.gov/
### Resource 1:
**Why did Mrs McCormack’s tea-rooms disappear down the river on August 18th?**

| 1. Most of the local farmers have ploughed up their grass meadows next to the river, and now grow crops on the floodplain. |
| 2. This summer has been one of the worst on record: there have been several periods of prolonged rainfall, and the ground is very saturated. |
| 3. Paul Appleton, the local forester, will be busy next year; he has to plant thousands of new trees to replace those he harvested earlier in the year. |
| 4. Mrs McCormack’s shop is located in a small scenic village lying at the confluence of two of the areas’ main rivers. |
| 5. Scientists believe we are beginning to see the results of global warming. |
| 6. More tourists arrived in the village this year thanks to the new roads that have been built. |
| 7. Mrs McCormack’s customers loved the view offered by her tea-room’s waterfront location. |
| 8. The village has expanded rapidly in the last few years – several new property developments have been built. |
| 10. Flood insurance for the properties in the village is extremely expensive. |
| 11. The BBC showed images of the flood devastation on the morning of 19th August. |
| 12. The flood damage has been estimated at £10 million. |
| 13. The village bridge had several arches; in times of high water this could get blocked with material. |
| 14. The village rugby team now played on a ground that in the past was marshland. |
| 15. The two river valleys are formed on a layer of thick rock. |
| 16. The sluice gate (which formed part of a basic flood alleviation scheme) was not properly maintained, and sometimes it could get jammed. |
| 17. Mrs. McCormack’s son Ben enjoyed trekking up the slopes of the steep river valleys. |
| 18. The local council designated less money to flood protection every year, asking what was the point when there hadn’t been a flood for 60 years. |
| 19. The river embankments were gradually feeling the effects of all the tourist activity along the river. |
| 20. Two years ago local Fisherman, concerned about the destruction of the river, launched a successful campaign to stop the regular dredging of the river. |
| 21. On 17th August villagers were issued with sandbags. |
| 22. In the early part of the evening of 18th August, Mrs McCormack was airlifted by helicopter to safety. |
| 23. The emergency pumps arrive on the morning of 18th August, but they just aren’t powerful enough. |
| 24. At the height of the floods, boulders the size of cars were being washed down the river. |
| 25. The clean-up operation will take weeks, and the village will take over 18 months to rebuild. |
| 26. Before the river’s course was altered, it used to meander slowly across the floodplain. |
| 27. Only those buildings above the floodplain remained undamaged. |
| 28. Mrs McCormack had to take out a loan to finance the opening of her tea-rooms. |
| 29. Peat from the surrounding moors has been removed. |
| 30. Nobody expected the storm to be quite so severe. |
Resource 3 How can we protect ourselves?

The question on the lips of the residents of Mrs McCormack’s village following the disastrous events of 18th August is “How can we protect ourselves?”

Many people, along with Mrs McCormack, lost their businesses and livelihoods and now fear for the future. Reports in the press indicate that the sort of flooding the village experienced is set to become more common, and floods that perhaps occurred once every 50 years may now take place every 5-10 years.

Fortunately, the local council is pretty efficient and it has started to develop a flood management strategy. Several experts were called in to offer their advice – engineers, geographers and geologists. However, there didn’t appear to be a simple solution so the council decided to put together several proposals.

After several weeks of intense planning and following a bit of fine tuning, four options for flood management were put forward, each with distinct advantages and disadvantages.

Option 1 HARD ENGINEERING

This is about altering the course of the river and building structures to contain it when it threatens to flood. It means straightening the river so that the water is able to flow more quickly, building levees to stop rivers overflowing, dredging rivers to make them deeper and wider, and building dams to control the flow of water.

Advantages

• Should be effective in reducing the risk of flooding in the short term.
• Its impact will be immediate.
• Residents will actually see where money is being spent, and may feel more secure.

Disadvantages

• Cost: hard engineering is extremely expensive, and local residents finance any deficit in funding through their council tax
• In the long term its effectiveness decreases: the building of embankments will soon increase the amount of dredging that needs to take place
• Appearance: hard engineering is an ugly business and the river become far less pleasing to the eye
• Damage and destruction to plants and wildlife
• Knock-on effects: hard engineering in one place may lead to flooding in another place downstream.
Option 2  SOFT ENGINEERING
This means using new natural methods of flood control. It means allowing rivers to flow freely and in some places letting them flood the land. It is about reforesting areas to reduce run-off into rivers and returning farmland to its natural state.

Advantages
• Environmentally friendly, respects the natural environment, and encourages the growth of wildlife habitats
• Cheap compared with hard engineering
• Pleasing to the eye – the river retains its natural beauty
• Sustainable.

Disadvantages
• Its impact is not immediate.
• Farmers will often demand large sums in compensation for loss of cultivated land
• Local residents don’t feel protected (this is a prevention strategy)
• There is a huge demand for development of the flood plain
• It can prove very difficult, sometimes impossible to return a river to its natural course.

Option 3  RETREAT
This would mean accepting the loss of that part of the village which was destroyed in the flood, and placing a ban on redevelopment of any area that might be at risk from flooding. A total ban on any sort of development of the floodplain would have to be introduced.

Advantages
• Nobody would be at risk from future floods.
• Money would not have to be spent on flood protection.

Disadvantages
• People would have to be re-housed
• People would have to be compensated for the loss of their businesses
• There may not be enough land to re-house people in the local area.
Option 4  DO NOTHING
This means re-building the area damaged by the floods and continuing with life as it was before the floods.

Advantages
- Cost: money will not have to be spent on protection, prevention or compensation
- People can continue with life as it was before the flood.

Disadvantages
- There is a risk that a similar flood could occur next year, again destroying buildings and businesses
- Unsustainable: this is not a long-term strategy, because flood risk is increasing as people’s activities impact on drainage basins and because of climate change.
Resource 4 Interest groups

BOBBY SUMMERS
Bobby is a local farmer who has just secured a contract to supply vegetables to Tesco; these he grows on fields located on the river’s floodplain. He is keen to expand the area of land that he has under cultivation on his farm by cutting down several areas of woodland, and draining swamps and marshes.

Although he was sad to see the devastation that the flood did to the village, his real concern was the loss of several fields of crops. He can bear the burden of such a loss this year, but a repeat flood next year would lose him the Tesco contract and put him out of business. Bobby wants the local council to act fast!

PETER TYSON
Peter is a local lad who works for the National Trust. He loves the countryside and spends his free time fishing and bird-watching. However, in recent years he has become unhappy at the state of the countryside, as farms have become too big and industrialised, and fields have been enlarged as hedgerows have been destroyed. He fears that several species of fauna and flora will soon become a rarity to the area as water meadows are given over to farming.

Peter sees the floods as a mixed blessing: on the one hand nature has re-captured some of its land, but on the other hand it means that there will be calls for proper hard-engineering flood protection measures.

JASMINE GALLOWAY
Jasmine runs a small hotel in the centre of the village. The floods were disastrous for her business. Although her hotel was not damaged, she has been unable to attract any guests since that fateful night of August 18th. Tourists are worried about returning to the area for fear of similar flooding at some later date.

Furthermore, the village is still a mess and some of the attractions have yet to reopen after the floods. If businesses like hers are to remain afloat, Jasmine feels that the council has to not only protect the village from floods, but maintain the natural attraction of holidaying by the river.

ANGELA ANDREWS
Angela can’t believe her misfortune. She spent the last five years saving money so she could put down a deposit on her first home, only to move into a property that now turns out to be prone to flooding. The estate agent didn’t warn her that all the new houses on the estate were built on a floodplain.

The floods of August 18th totally submerged the ground floor of her house, thousands of pounds of damage was done, and it now turns out that her insurance won’t cover her losses. Although she loves the village and it is an ideal location for her work, Angela thinks she’s made a big mistake, and is not sure she’ll ever get her money back on her house.
Resource 5 Different points of view

Who cares about the tourist industry? I just want my house protected from floods.

The National Trust tells me that so much damage has been done already to the rivers ecosystem that foodwebs will struggle to recover.

I'm telling you, without farming this community would be dead!

I've lived here all my life and I can't afford a house in the village. We need more affordable new homes.

The river needs engineering for goodness sake.....we are living in the 21st century!

I don't think you'll find anyone willing to move home.

Most of the tourists visit because of the beautiful countryside, they love the river walks.

If you continue to build on the floodplain then more floods are inevitable.

Engineers shouldn't have altered the river in the first place.

The tourist industry will not stay alive unless there is affordable housing for workers in the industry.

At the moment we can't get flood insurance, companies say that it is too big a risk.

Straight river channels, higher river banks, dredging and dams is what we need!

There is not much likelihood of the village being flooded like that again.