Lesson plan
Secondary

The Water Resource
Let WaterAid help you make learning about water fun

Mapping water

WaterAid

Introduction

These lesson plans introduce students to the mapping techniques that are used to plan the best location for water points in villages in the developing world. It explores how these techniques are used by WaterAid and the importance of community participation in the process. We are using an example in Malawi and there is an opportunity to conduct an in depth study of the country. Students are encouraged to think about how they can map water usage in school in order to plan how to save water and how to promote their ideas to others.

Curriculum links

Citizenship and Geography key stage 3 and 4 lessons.

Geography key stage 3
Unit 12 Images of a country
Unit 14 Can the earth cope?
Unit 24 Passport to the world

Citizenship key stage 3
Unit 12: Global issues, local action

Key stage 4 links are in accordance with individual examination board specifications.

Aims

- To explore how communities use mapping techniques to identify the best locations for new water points.
- To analyse and evaluate evidence and present findings to draw and justify conclusions.
- To investigate how to save water in school.
- To explore creative approaches to taking action on problems and issues to achieve intended purposes.,To draw annotated maps.
- To work individually, and with others, to negotiate and plan how to influence others to bring about change.

Keywords

Sanitation
District authorities
Hygiene education
Latrine
GPS

Resources

Mapping water in Malawi film http://www.youtube.com/watch?v=1bayCtABJ6M
Mapping water slideshow
Composting latrines in Malawi film http://www.youtube.com/watch?v=VB3IX32EHjw

Resource 1: Images
Resource 2: Decision making activity
People's stories: Yoram Beris, Tanzania
Essenati Obadi, Mozambique

Notes for teachers

This set of lesson plans introduces students to the concept of water mapping that is used by communities with which WaterAid work. The lessons act as a stimulus for debate and discussion around many development issues and can be used as they are or adapted to explore the subject in more depth.

The lesson plans below can be used as the basis for a number of lessons, and allow the teacher to choose whether to cover all aspects of the plans or just a few. Some of the activities might be particularly suitable for homework or extension work. Resources can be found at the end of the lesson plans.

There are suggested questions for students which can be used for written work or class discussion. They are a guide for using the resources and stimulus material and can be adapted to suit specific learning groups.

Lesson plans

Key question	Activity	Resources
What can we find out about water and sanitation in Malawi?	• Watch the introduction to the 'Mapping water in Malawi' film (up to the point where a map is shown). • Ask the students for their initial thoughts on what they have seen. • They should think of at least three questions that they would like to ask Boyce to find out more about what he has said and write the questions down. Ask some of the students to share their questions with the rest of the class and debate together what the answers might be.. • Watch the next section of the film (up to the caption that says 'WaterAid has been working in Malawi since 1999'). Ask students answer their questions from what they have seen and write down as many facts about Malawi as they can.	Mapping water in Malawi film
	Extension activity (optional): • Split the class into small groups. Give each group a copy of resource 1 and ask them to cut out the images. Explain that all the images are from the Salima district in Malawi. • Ask the students to choose five images and discuss what they can find out about water and sanitation in this region of Malawi by looking at the images. They should consider: 1. Who the people might be. 2. What the people are doing and why they are doing it. 3. Imagine what the surrounding area might be like to visit. 4. Whether they think the people are rich or poor and why. 5. What sort of jobs people have. 6. What the roles of women, men and children might be. 7. Do the people in the images look happy or sad? 8. Do the people have access to clean water and sanitation? • Once they have gathered their images and thoughts, students can create a mood board. They can use a large piece of paper on which to annotate and label the	**Resource 1:** Images from the Salima district, Malawi

	images with their thoughts and feelings about what they can see. • Students can use the WaterAid website information about Malawi and other research to create a multiple choice or true or false quiz about Malawi which they can then swap with other students in the class. http://www.wateraid.org/uk/where-we-work/page/malawi	

What is water mapping? How has mapping helped some of the poorest communities in Malawi?	• Locate Malawi on a world map. Ask students what maps are used for and who uses them. What sort of information can be found on a map? Create a large spider diagram with as many uses for maps and information featured on maps as possible.
	
	• Explain to the students that they will be finding out how maps are being used in Malawi to plan where to put water facilities. What information do they think might be useful to put on a map for such plans?
	
	• Watch the next section of the 'Mapping water in Malawi' film and ask students to answer the following questions:
	
	  • Why is it difficult to get to poor communities in Malawi?
	  • Why was it difficult to find out which places in Malawi have access to clean water and sanitation (toilets and sinks or hand washing facilities)?
	  • How did the researchers in the film construct their maps?
	  • What are the maps now being used for?
	  • How do WaterAid carry out its work once it has located a community that needs assistance?
	  • Other than bringing clean, safe water to the community, what else does WaterAid do with the community and why is that an important part of the process?
	  • In Embangweni, what is the focus of WaterAid's work?
	  • What is a latrine?
	  • What is special about the eco-san latrine and how does it work? Students could draw diagrams to explain how the eco-san latrine works.
	  • Watch the 'Composting latrines in Malawi' film for further information. http://www.youtube.com/watch?v=VB3IX32EHjw
	  • How have children benefitted from using the eco-san latrine?
	  • How have families benefitted?
	  • How have farmers benefitted from using the latrine?
		Film: Mapping water in Malawi
		
		Composting latrines in Malawi film

	• How has life changed for those living in Embangwine since the eco-san latrine was introduced?Ask students if they think eco-san latrines could be useful where they live and how they could affect their lives.	
How does WaterAid involve communities in carrying out its work?	• View the 'Mapping water' slideshow. How are maps being used in the slideshow and how are they helping the community? • Why is it important for WaterAid to work in this way with the community? • Why do different people have different ideas about where the water points should go in the village? • Read the Yoram Beris and Essenati Obadi's stories http://www.wateraid.org/uk/~/media/Files/UK/Schools/peoples_stories__yoram.ashx http://www.wateraid.org/uk/~/media/Files/UK/Schools/peoples_stories__essenati.ashx • Divide the class into small groups and explain that they will be taking on the role of a group of people who live in a village in West Africa. Give out the set of instructions to each group and remind them that in addition to the information, they need to remember what they have learnt about how WaterAid works with communities. Reinforce that locally-sourced materials work best and that they must cover every member of the community and spend all the money. • Once the groups have completed the activity they should feedback to the rest of the class and give full explanations for their decisions. Please note that the Japanese hand-pump and rainwater collection system are not suitable for the area and if they have chosen these, students should be encouraged to think about why doing so may not be a good idea.	People's stories **Resource 2:** Decision making exercise sheets
Mind-mapping ideas	• Ask the class to create a mind map illustrating how water can be saved in school. Write 'How to save water in school' in the centre of a large piece of paper and brainstorm words or ideas that come to mind. For example, install water butts, put water-saving devices in the toilets. Make links between the words. Note what extra information might be needed and do research. For example, where to get water-saving devices or how often dishwashers are used etc. The research could include using	

	the internet, carrying out surveys or speaking to a local water company or you can get more information from the Energy Saving Trust (www.energysavingtrust.org.uk)	
How can we use a map in school to identify how to save water?	• As a class, draw an outline map of your school or an area of the school. Ask the students to think about all the things that use water in school such as taps, toilets, dishwashers and water fountains. Agree on simple symbols to represent these items and create a key to explain what the symbols mean. • When the map is complete, go through each of the items and the mind map research and label where and how water can be saved. For example, use the 'economy' button on the dishwasher, fix any dripping taps, install water-saving devices in the toilet cisterns. • When the map is complete, discuss whether the map is useful and what can be learnt from it? What does it tell you about the facilities in school? Do the students think any of the items should be relocated or even removed to save water? Why? How have the maps helped in saving water?	
How can we persuade other people to save water in school?	• Using the school maps, discuss how other people could be persuaded to put all the water saving ideas into action. Think about the target audience – who are they? What do they need to know? How they will be told? What resources are needed and who needs to be involved and spoken to. • In small groups, lay out the shape of a tree in the middle of the floor. This could be done by drawing a tree on several pieces of flip chart paper stuck together or by using wood or other materials to make a collage. • Each part of the tree can then be used to plan ideas for persuading others to save water. Use the tree in the following way: **1. The trunk is for your action** Decide on **one** action you could take. For example, plan an assembly on saving water in school. Write and/or make a symbol for this and add it to the tree trunk. **2. The fruit are your goals** Use the fruit to display your goals. For example, reducing water use in school. **3. The branches show how you aim to achieve the goals** Use the branches to show the tasks you will do to achieve these goals. For example ask the	

	headteacher for an assembly slot or write a play. **4. The leaves represent everyone's roles** Write people's names on the leaves to show who is responsible for each part of the plan. **5. The roots show the resources that are needed** On the roots write and/or make symbols to show all the resources that will be needed to put the plan into action. For example, skills, materials and contacts, websites, films. • Once the trees are finished they should be presented to the rest of the class who could feedback any suggestions or ideas to help with the plans.	
How can mapping help us reflect on what we've learnt?	• Ask students to think back to all the different types of mapping they have used and learnt about. They should recap and consider: 1. How have maps helped communities in Malawi gain access to clean water? 2. How have maps helped to bring communities together in making decisions about where to locate water points? 3. How have maps helped in making decisions about how to save water in school? 4. How can a map help to plan action?	

Resource 1: Images from the Salima district, Malawi

Photo A

Photo B

Photo C

Photo D

Photo E

Photo F

Photo G

Photo H

Resource 1: Images from the Salima district, Malawi cont.

Photo I

Photo J

Photo K

Photo L

Photo M

Photo N

Photo O

Resource 1: Photo captions

Photo A - People at the handpump, Mzalule Village, Kuluunda Area, Salima District, Malawi.

Photo B - Amin Uladi (pink shorts) who comes to water his plants everyday. He is growing vegetables and has seven plant beds, from which he makes about 350 Kwacha a week (the equivalent of around 5p). Kwacha is the currency of Malawi

Photo C - Village scene, Kuluunda Village, Kuluunda Area, Salima District, Malawi.

Photo D - Woman taking bread out of the oven which is then sold in her bakery business, Cholokoto Village, Maganga area, Salima District, Malawi.

Photo E - Woman washing clothes on the shore of the lake, Lake Malawi, Salima District, Malawi.

Photo F - Children playing in the lake, Lake Malawi, Salima District, Malawi.

Photo G – Community meeting to discuss water and sanitation issues.

Photo H - A traditional cow and cart transporting straw through the village, Tondani village, Salima District, Malawi.

Photo I - Gloria Kachaba, on her way to school with some other students, Mbilila School, Salima, Malawi.

Photo J - Teacher at the chalkboard in the classroom, Mbilila School, Salima, Malawi.

Photo K - Fishermen with their boats on the shore of Lake Malawi, Salima District, Malawi.

Photo L - Children carrying water, Kuluunda Village, Kuluunda Area, Salima District, Malawi.

Photo M - Women from the Chiyambi Women's Group collecting water at the open well to use at their bakery, Cholokoto Village, Maganga area, Salima District, Malawi.

Photo N – Child collecting water at the river, Katoma village, Salima, Malawi.

Photo O - A fisherman with some fish, Lake Malawi, Salima District, Malawi.

Resource 2: Decision making activity

In small groups, you will need to read through all the information before deciding how to spend your allocated budget. Make sure to read the information carefully and give reasons for your choices.

Background information

- You live in a small village in West Africa with a population of 300.
- Your village does not have access to clean water and toilet facilities.
- Many people lack understanding of basic hygiene (eg when and why they should wash their hands and how they wash their hands).
- You and the other villagers are poor. The main reason for this is that the only source of water is six kilometres away and collecting water can take up to five hours a day so this leaves very little time to work or go to school.
- The village is in a dry area, there is little rain, but there is ground water.
- When you do have water it is dirty, many people in the village are often too sick to work or go to school and the death rate is high.
- WaterAid has agreed to work with the villagers to provide clean water, toilet facilities and hygiene education.
- WaterAid has provided **£3,000**, the government has provided a grant of **£1,000** and the villagers have contributed **£1,000** and have offered their labour.
- Your village has a total of £5,000.

How will you spend this money to help bring clean water, toilet and hygiene facilities to your village?

Resource 2: Decision making activity continued.

Things to think about

- Clean water will mean there will be more time for school, particularly for girls who are often responsible for water collection. Education is very important in order to start getting out of poverty.

- A convenient and clean supply of water will increase farming produce. This means that there will be more food for the community to sell and eat and an opportunity for people to start small businesses of their own.

- Composting latrines decompose human waste to produce free, effective and environmentally friendly fertilizer for crops.

- Treatment for illnesses is more effective where clean water and food are available.

- Illness caused by dirty water increases medical bills and reduces an individual's capacity for work, leading to greater poverty.

- Clean water will mean there is more time to cook and eat regularly.

- A reliable source of water allows families to clean themselves and their homes more frequently – leading to a healthier living environment.

- Clean water and toilet facilities close to home will result in more time to work and earn money.

Resource 2: Decision making activity continued.

Shopping list: You have £5,000 to spend

You must provide clean water, sanitation facilities and hygiene education for all 300 people in your village and ensure that the villagers have the knowledge to maintain these practices.

£50 pays for hygiene games that will reach 150 children

£50 will build a composting latrine for two families of five, which will provide free fertilizer to increase crop output

£150 pays for a puppet show to demonstrate hygiene messages that will reach 250 people

£300 trains a teacher to raise hygiene awareness to 150 children

£350 will build a block of six composting latrines, used by 100 people

£500 will train and pay the salary for a hygiene educator for a year who will reach 300 people

£500 will train and pay one female engineer to maintain pumps/wells

£500 pays to rehabilitate existing wells, using parts found locally, that will be used by 100 people

£500 pays for a rainwater collection system which, when full, will supply water for 300 people

£750 pays for one Japanese handpump (spare parts not included) used by 300 people

£1000 will build a well, including labour and materials, used by 150 people

£1000 will facilitate community consultation on new facilities for 300 people

£1000 pays for a locally made hand-pump, used by 150 people

Please note that this shopping list is fictional and only for the use of this activity.

Resource 2: Decision making activity continued.

Who lives in the village?

Children (150) – After women it is children who become responsible for collecting water. This reduces their chance to attend school and the time they have for play. Children learn quickly and WaterAid works closely with schools to promote hygiene messages. Children take these messages home and teach them to their families.

Women (75) – Women play very important roles in the collection and use of water and in hygiene education. Their importance is overlooked in many cultures. WaterAid aims to involve women directly in all decision making and will often train women to maintain facilities or become hygiene educators.

Men (75) – The men are keen to raise income and to have the opportunity to lift themselves out of poverty. Improved water supplies and toilets will increase what is produced. The extra food not needed by the family can then be sold, creating extra income. With more money the family will be able to pay for education and medicines which start to help them out of poverty.

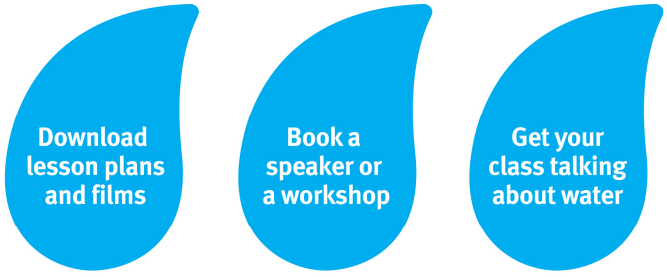
Teachers (10, will also affect children) – Teachers would like toilet and water facilities in or very near to the school. This would improve the working environment for teachers and encourage more children to attend school. Schools can also be a good place to promote hygiene education messages. It is particularly important that there are toilets for girls during menstruation so that they don't have to miss classes.

Medics (7, will also affect 90 villagers) – The clinic would like a clean water supply. This would enable them to sterilize all equipment which reduces the risk of infection. Women would benefit greatly from clean water and better hygiene during pregnancy and childbirth, while post-natal (after giving birth) health improves and the risk of infection is greatly reduced. The medics would also like to raise hygiene awareness.

Credits and acknowledgements

Photo credits:

Contents page photo: WaterAid/ Abir Abdullah.

Photos A–F, K, L, M, O: WaterAid/ John Spaull.

Photos G, H, I, J, N: WaterAid/Layton Thompson.