

Lesson Plan: How Water Gets Contaminated



45 minutes total

Lesson Description



Participants will explore how water gets contaminated by building a model of a watershed and discussing the impact of agriculture, industry, poor sanitation, and pollution on water quality. They will discuss how human activities are the causes of water contamination.

Learning Outcomes



At the end of this session participants will be able to:

1. Explain how water gets contaminated
2. Discuss the different ways that humans cause water contamination

Materials



- 3 jugs of clear water and glasses
- Tea, dirt, sand, or anything can make water look dirty

Option 1: Drawing a Watershed – one for every 5 participants

- 1 flip chart (with drawing of mountains and a river)
- Markers of different colour
- Trees cutout
- Tape

Option 2: Water Contamination Model – one for every 10 participants:

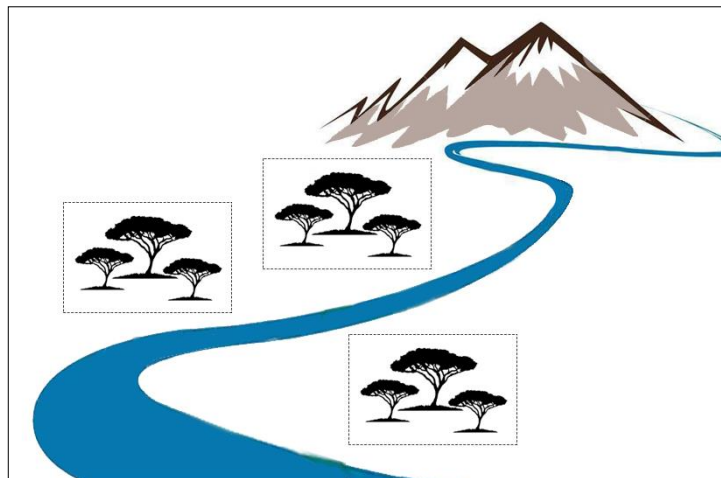
- 2 bottles of water with holes perforated in the lids – one per model
- 1 bottle or jar with large holes perforated in the lid
- A large sheet of plastic
- Dirt or sand to shape hills or a surface with natural contours
- Play dough or clay for building miniature houses, people and livestock
- Grass
- Small balls of dirt to represent feces
- Seeds or colourful spices like turmeric or paprika to represent chemical contamination
- Pieces of paper to represent garbage
- Food colouring

Preparation



- Optional: Write the learning outcomes on flip chart paper
- Fill 3 jugs of water; put a tea bag in one and dirt in another; leaving one clear.
- Option 1 - For each set:

- Draw 3 sets of trees on blank paper and cut them out (try to draw trees that are appropriate to the local geographical context – if the region is rainforest, you can draw and cutout more trees)
- Draw mountains on one side of the flip chart and river that travels from the mountains to the other side of the flip chart.
- Tape the cutout trees near the river
- Example (draw something similar):



- Option 2: Set-up the water contamination model:
 - Look for a place on the ground with good drainage where people will not mind if you pour water.
 - Create two small hills with a valley in between using dirt or sand. Alternatively find a surface with these characteristics.
 - Lay a plastic sheet over the hills and valley.
 - Be sure there is a space in the valley between the two hills that can represent a river.
 - Use small rocks to pin down the plastic.
 - Fill the bottles with water

Introduction

5 minutes



1. Place the three clear jugs of water on a table.
2. Invite a few participants to get some water to drink.
3. **LINK:** When they are not taking water from the first and second jug, try to offer it to them. When they refuse, ask them why. Try to get the word contamination from them.
4. Ask the rest of the participants to discuss in pairs and then share which jug they would choose from and why.
5. Present the lesson description or learning outcomes.

How Water gets Contaminated

35 minutes



Option 1: Drawing a Watershed

1. Explain to participants that they will now be looking at different ways that water can become contaminated.
2. Display one of the images of the watershed that you have drawn earlier to the front of the group.
3. Explain to participants that you have drawn a watershed. Explain to participants that a watershed is similar to a bowl where all the rainfall that occurs inside the bowl, ends up in a river, which ends up in the ocean. Every part of land on earth belongs to a watershed. Watersheds can have different sizes, from the size of continents to the size of a small valley.
4. Explain to participants that any water taken in the watershed, from surface water, to groundwater, has come from rainfall. The water has either penetrated the soil, or has run off the surface and ended up in a river.
5. Explain to participants that they will be working in group to build a new community on their watershed drawing. The current watershed drawing is currently not being inhabited by humans. They will most likely need to cut down some of tree to build houses, fires, or tools. They will need to remove the tree that you have taped on the drawing.
6. Divide the participants into groups of 4-5 and give each group 1 of the watershed drawings.
7. Give participants 10-15 minutes to draw a village on the watershed map. They will need to include everything a village would normally have: houses, agriculture, a market, animals, roads, bridges, latrines, wells, etc.
8. When finished, ask each group to stick their village drawing on the wall in the front of the room. Ask all the participants to gather in front of the drawings.
9. Ask each group to present their village.
10. After each presentation, ask them: "how do you think your village affects the quality of the water of the river?"



Option 2: Water Contamination Model

1. Ask the participants to discuss in pairs and share all the ways that water can get contaminated. Share as a whole group.
2. Take participants to the water contamination model.
3. Ask participants to use play dough or clay to shape houses, livestock and people to populate the landscape and place them on the surface of the plastic.



4. Encourage participants to use other objects to add different elements to the landscape like agriculture fields, factories, etc. Encourage them to add features that exist in their community.
5. Ask participants to put small pieces of paper on the landscape in places where they generally find garbage.
6. Ask them to use the shaker with seeds or spices to cover areas where they place fertilizers or agricultural chemicals.
7. If there are other sites of chemical contamination in the community such as factories, ask them to sprinkle the seeds or spices around them.
8. Now ask participants to place the pieces of dirt on the model in locations where they find open defecation or defecation from animals.
9. Ask participants to consider what might happen to this contamination when it starts to rain – where will it go? Share ideas.
10. Ask for two volunteers to pour water on to the model using the perforated bottles and get the remaining participants to observe what happens.
11. Ask participants to explain what they are seeing: *The “feces” and “chemicals” mix with the rainwater and then run into the river water.*

End of Option 2

12. Ask the participants if they would like to drink from the river water. Why or why not?
Most will say no because it is contaminated.
13. Ask participants if there are any parallels or similarities between the river and their water own water source, or a source they have seen in a village.

Review**5 minutes**

1. Ask participants to write down a list: “What human activities could have potentially led to the contamination of the water in the 3 jugs in the introduction?”

Reflections on Lesson