What happens to polluted water within the water cycle?

Explanatory video transcript

(0:08)

What happens to polluted water within the water cycle?

Have you ever thought about what happens to polluted water during the water cycle?

With this experiment it is possible to reproduce the water cycle with few materials, easy to find at home or at school.

(0:25)

The water on earth is being contaminated, causing natural disasters.

Do you know causes of water pollution?

Here are some examples:

- sewage and wastewater
- oil spills
- industrial waste
- agricultural runoff
- plastic pollution
- radioactive waste

(0:48)

Do you know the water cycle?

The water cycle involves the continuous movement of water from the Earth´s surface to the atmosphere and back again. The key stages in the water cycle are evaporation, condensation, and precipitation. On Earth, water is collected in lakes, rivers and oceans.

(1:11)

Can you present a definition of the key stages of water cycle?

- Evaporation – The conversion of water into vapor due to heat.
- Condensation – The transformation of water vapor into droplets or ice crystals when cooled.
- Precipitation – Water (rain, snow) falling from the atmosphere to the Earth.
- Collection – The gathering and storage of water in oceans, lakes, and rivers during the water cycle.

(1:44)

During this experiment we simulated the water cycle. Do you know what each of the materials we used represents?

- Water bottle – Symbolizes Earth's water bodies, like oceans and rivers, where water is stored. It helps to create a semi-closed environment, allowing the simulation of the water cycle processes.
- Water with red dye – Simulates the presence of pollutants in the water.
- Plastic wrap – Simulates the Earth's atmosphere. It helps to restrict the escape of evaporated water.
- Pot with plant – Symbolizes the presence of plants, which in nature contribute to the water cycle through transpiration.
- Stone – Simulates a cloud, aiding in the formation of water droplets, like in condensation.

(2:38)

What happened to the coloured water during the experiment?

When we place the assembly near a sunny window, the sun heats up the water, which turns from liquid to vapour. This process is called evaporation.

When the warm water vapour comes into contact with the cooler surface of the plastic film, and even of the water bottle, it cools and transforms back into tiny water droplets. This process is called condensation.

These water droplets accumulate on the plastic film, simulating the formation of clouds in the real atmosphere. The weight of the stone we placed on top causes more droplets to gather like in clouds, making it rain inside the glass. This process is called precipitation.

Inside the glass we have collected the purified water and our pollutant was left behind.

(3:33)

A similar process takes place when salt is formed: water vapour rises into the atmosphere, leaving salt crystals behind.

(3:42)

What other materials can we use to dye the water?

You may also use natural or artificial liquid food colours or a strong tea like hibiscus or red fruit tea.

(3:55)

What if there is no sunny day to heat the water?

If there is no sunny day outside, place it near an artificial heat source like a strong lamp or a heater.

(4:12)

In nature, water cycle is a natural water filter.

But, as you can see in this experiment, the pollution remains in the nature, so it is very important to not to pollute the water.

(4:23)

Water is essential to life.

The United Nations SDGs are a global pact to protect the planet and humanity.

Goal 6 “Clear Water and Sanitation” and 14 “Life Below Water” must be put into action to protect water and life on Earth.

(4:43)

Wastewater treatment plants are places where water is purified.

But, that´s not enough. It is in our hands to take action. We must clean the pollution from rivers, lakes and seas so that we can continue to enjoy a nice glass of fresh water for many, many years to come.