Water Purification

sead : stem

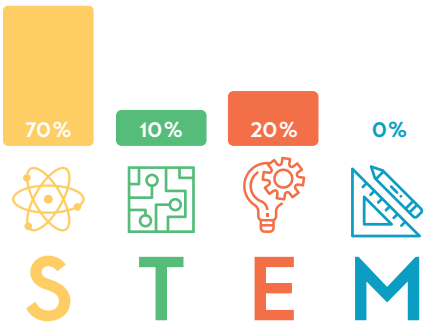
Subjects
Chemistry Biology

Topics
Filtration Purification of Water

Key Words
Clean water Purifying Water

Connection to SDG

STEM Chart



Introduction

One of the main problems in many regions is the access to clean water. Water is scarce and therefore requires the technology that can help provide water, especially clean water. Water can be obtained from various sources, even from wastewater. In most places in Indonesia, simple water purification techniques using natural materials have been applied for a long time. The dirty water in the river can be purified using those materials to provide clean water to villages and communities.

Purification technology can be made using a simple reactor and natural materials that are adjusted to the level of purification.

Key Objectives

1. Critically designing a model for purifying water.
2. Understanding characteristics and function of each component in purifying water model.

Materials

1. Wastewater
2. Stone, palm fiber, sand, fine gravel, coarse gravel, charcoal
3. Transparent medium-sized container
4. Transparent container with spout
5. Transparent cup or glass

Safety

1. Be careful when using a knife or scissors to cut the bottles
2. The edges of the plastic bottles may be sharp and cause injuries.

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Guiding Questions

1. Which design aspects need to be considered when constructing a water purifier?
2. Why do we use those materials to purify the water?
3. Which the most effective model to purify the water given the set of materials?
4. Can you compare the water turbidity before and after purifying?

Teacher Tip

1. Divide the students into groups of 2 or 3, and give each group the necessary materials to compare the result of water using different combinations of materials.
2. The students can also be challenged to modify the system design for the water flow or the container.

Task A

1. Cut one empty bottle of water at the bottom.
2. Install cotton or cloth at the other end of the bottle, then tie it with a rubber band or yarn.
3. Make layers of filter material by inserting ingredients into the bottle. In the following order: rock → gravel → charcoal → fine sand → palm fiber → fine sand → palm fiber. See the image below.
4. Record the sequence of layers you made if it differs from the instruction.
5. Pour dirty water into the bottle. Observe the water coming out of the device.
6. Compare the clarity of the water that comes out with the incoming water. Keep the water for subsequent comparisons.
7. Observe and record the speed in the screening process. The speed of the screening process can be calculated by comparing the volume of water that is stored at a certain time (for example within 15 minutes).
8. For a second experiment, replace the sequence of material layers according to group agreement.
9. Compare the water flow and time of flow with the first attempt.
10. Compare the quality of your group's filtered water with the water quality of other groups.

Fig 1

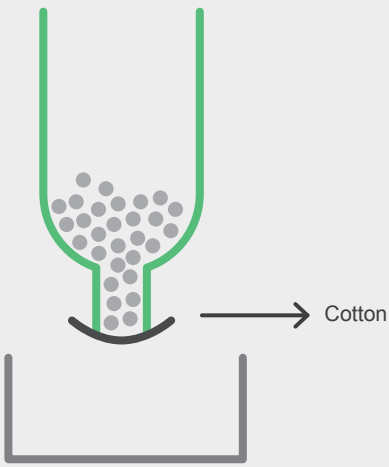

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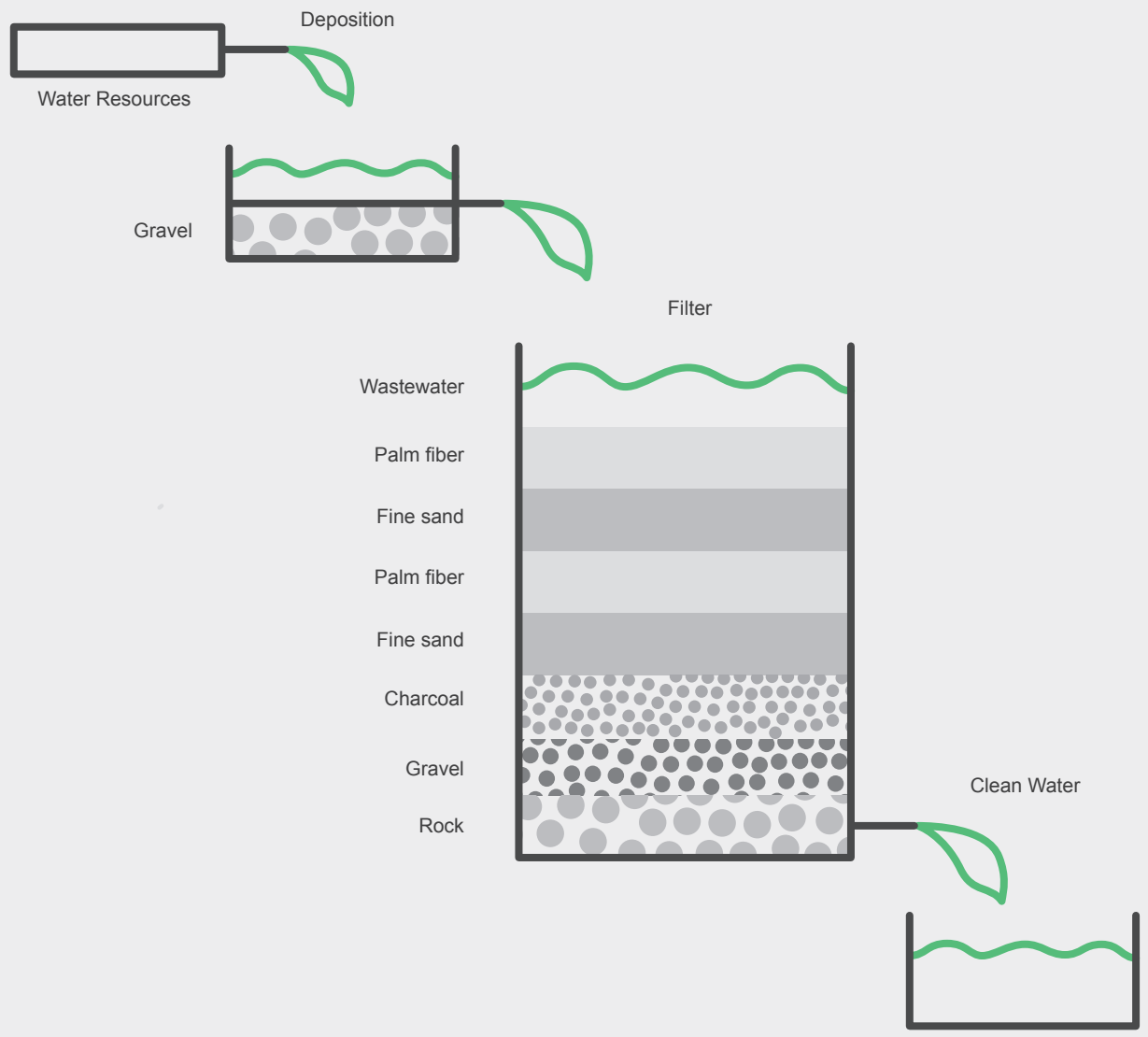
Fig 2



Questions about the experiment

O Do you know a simple water purification technique? Make a scheme of the tool and explain.

A Simple water purification techniques make use of layers which are made of several materials such as sand, gravel, stone, charcoal, palm fiber or coconut fiber, and cotton or cotton cloth. Dirty water can be poured into an opening in the top, then it will flow through the bottle and flow out at the bottom as clean water.

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Key Words: Clean water, Purifying Water

Assessment

Score	4	3	2	1
	The answer is complete, accompanied by a scheme	The answer is incomplete, accompanied by a scheme	The answer is complete, bit not accompanied by a scheme	The answer is incomplete, but not accompanied by a scheme