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CAWST is a Canadian non-profit organization focused on the principle that clean water changes lives. Safe water and basic sanitation are fundamentals necessary to empower the world's poorest people and break the cycle of poverty. CAWST believes that the place to start is to teach people the skills they need to have safe water in their homes.

CAWST transfers knowledge and skills to organizations and individuals in developing countries through education, training and consulting services. This ever expanding network can motivate individual households to take action to meet their own water and sanitation needs.

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This presentation is used with  
Lesson Plan 10: Intro to the Biosand  
Filter in the Biosand Filter for  
Technicians Trainer Manual.

Available at

[www.cawst.org/resources](http://www.cawst.org/resources)



# Introduction to the Biosand Filter



# Learning Expectations

1. Identify the different parts of the biosand filter: *lid, diffuser, concrete box, outlet tube, filtration sand, separating gravel, drainage gravel, biolayer*
2. Describe the function of each part of the biosand filter.
3. Describe how the filter works.



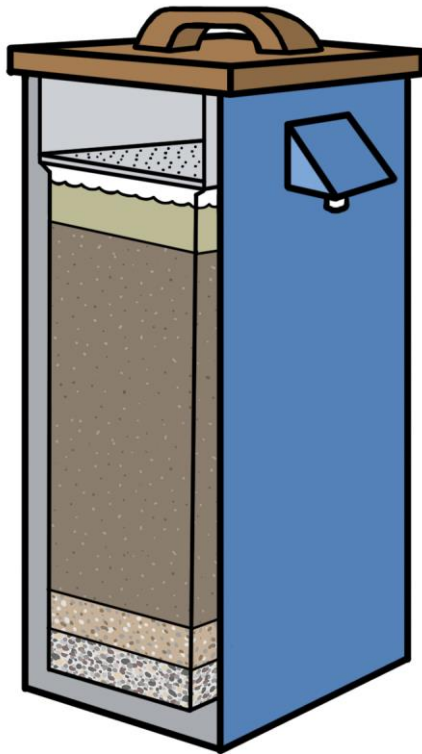
# What is a Biosand Filter?

A biosand filter is also called a BSF.

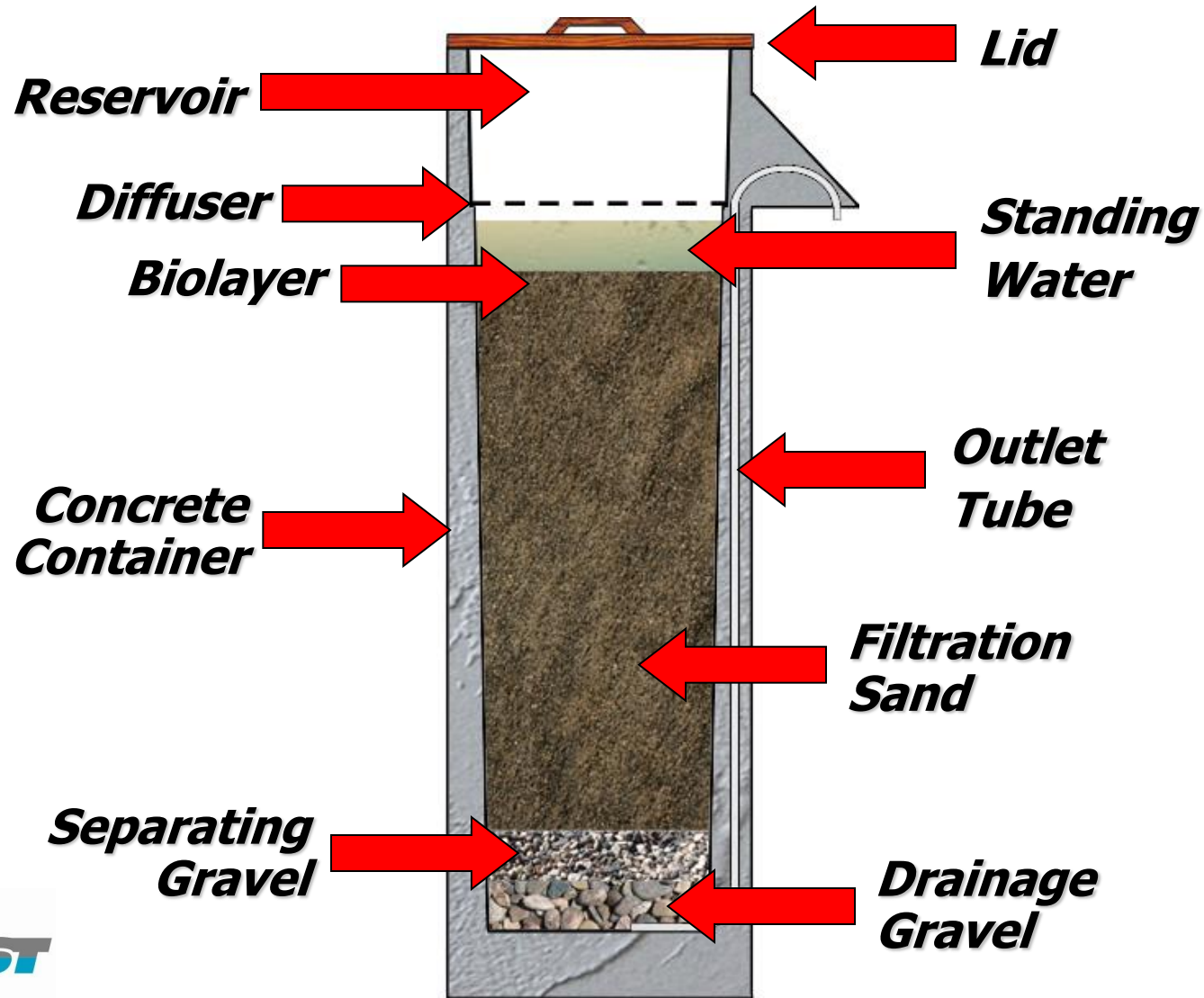
Discuss with a partner what you know about the biosand filter: what it is made of, the parts, how it works.



# What are the parts of a biosand filter?



# What are the parts of a biosand filter?



# Review

Name all the parts of the biosand filter:

*lid*

*reservoir*

*diffuser*

*filter container*

*outlet tube*

*filtration sand*

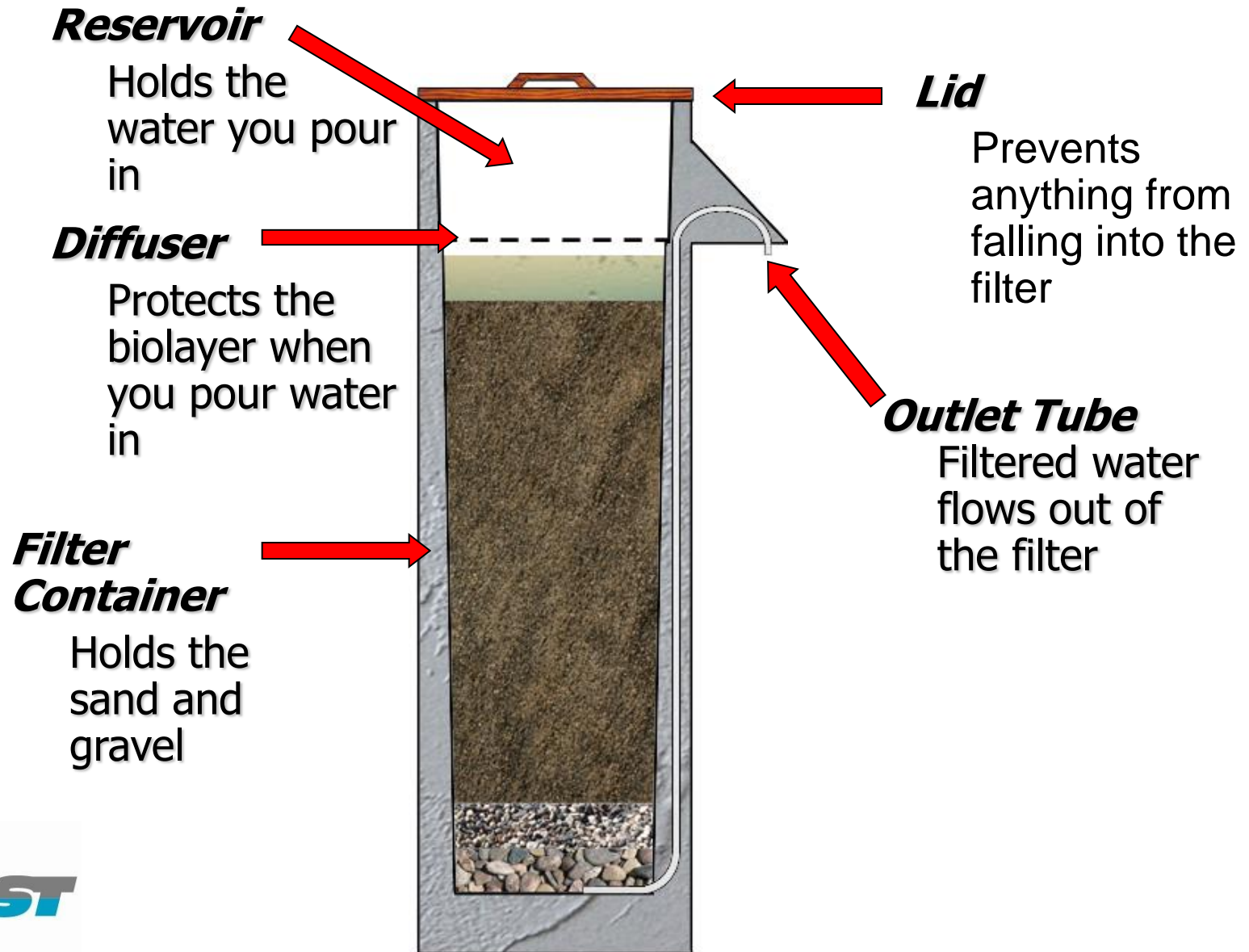
*separating gravel and drainage gravel*

*biolayer*

*standing water*



# Function of the Parts



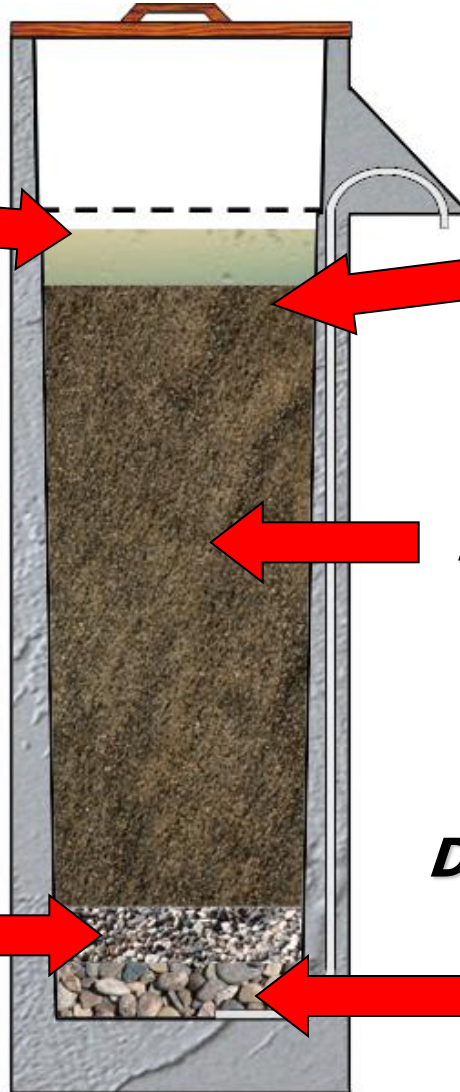
# Function of the Parts

## ***Standing Water (4 to 6 cm deep)***

Keeps biolayer wet and allows oxygen to pass through

## ***Separating Gravel***

Stops sand from moving down into the drainage gravel and entering the tube



## ***Biolayer***

Microorganisms that live in the top of the sand and remove pathogens from the water

## ***Filtration Sand***

Traps suspended sediments and pathogens

## ***Drainage Gravel***

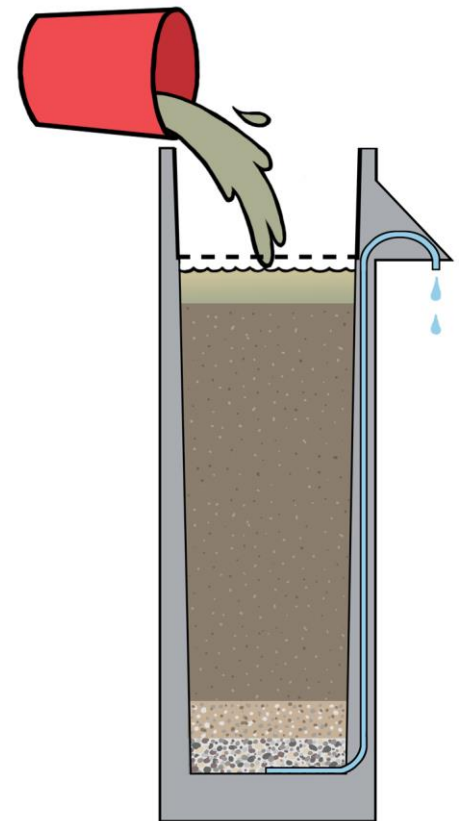
Stops sand and separating gravel from entering the outlet tube



# How Does the BSF work?

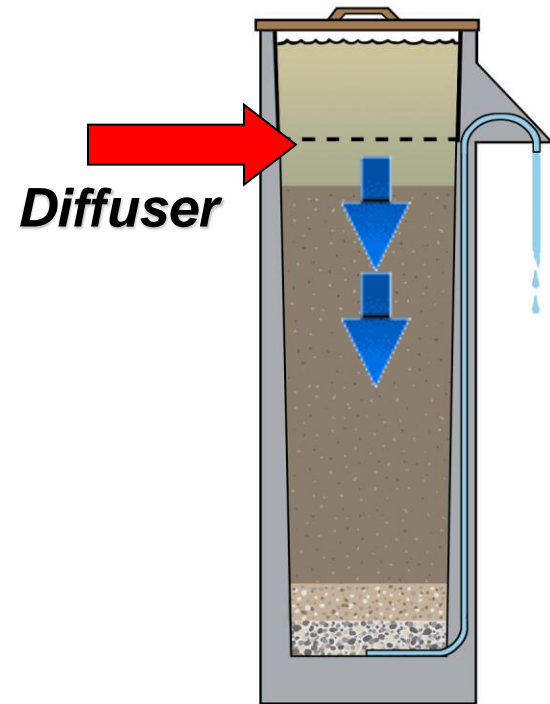
The filter always has some water in it above the sand (the Standing Water).

1. Pour 1 bucket of dirty water into the top of the filter.



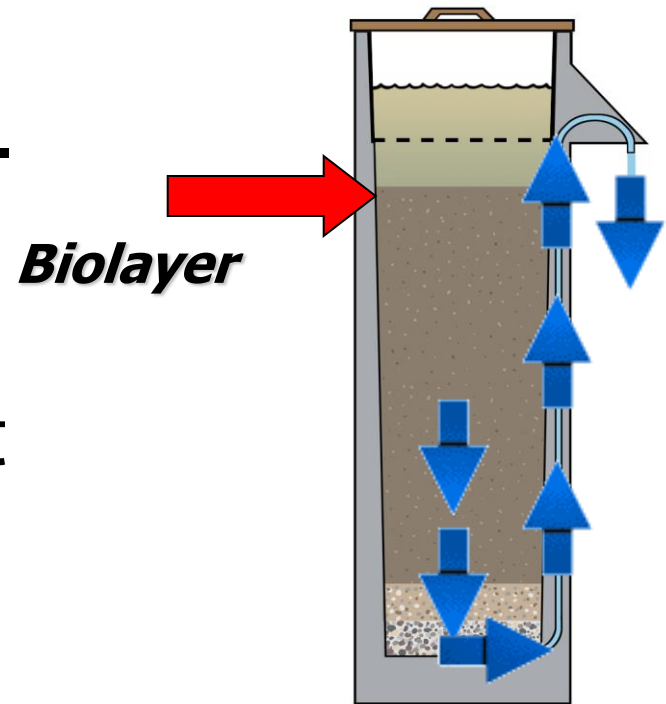
# How Does the BSF work?

2. The water drips through the diffuser and flows down through the sand. Water starts coming out the outlet tube.



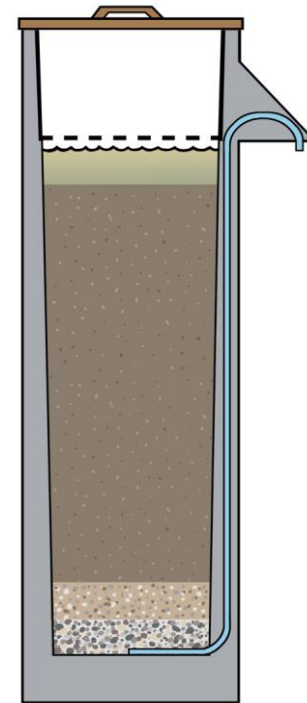
# How Does the BSF work?

3. Water travels slowly through the biolayer at the top of the sand. As the new water flows down, it pushes the water that was already in the sand out through the outlet tube.



# How Does the BSF work?

4. The filter will stop flowing about 1 hour later, when the water level is about 5cm above the top of the sand.



# Review

Describe to your partner what happens when a bucket of source water is poured into the filter.

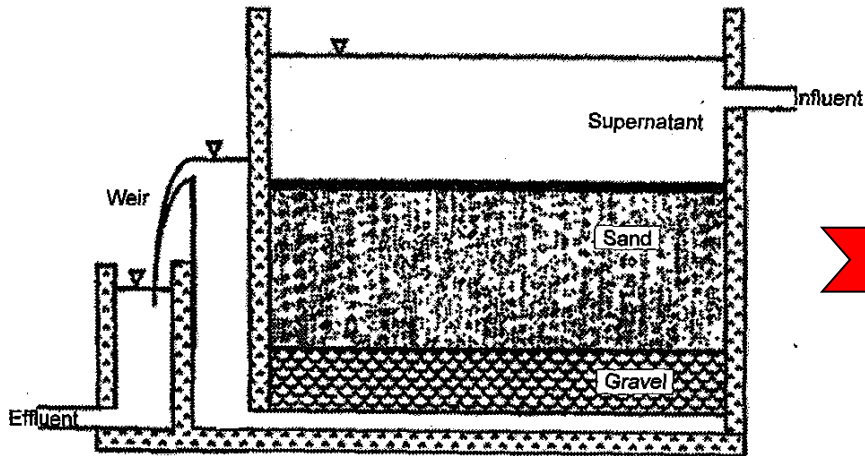
- 1. The unfiltered water flows down into the sand.*
- 2. The new water pushes out the water that was already in the sand.*
- 3. The pathogens in the unfiltered water are removed by the biolayer and the filtration sand.*

# Where does the design come from?

- The biosand filter uses the same design as filters in large water treatment plants.

## Slow Sand Filter

- BIG! For 1 Community or City



## Biosand Filter

- Small! For 1 household.



# Review

1. What is the function of the filtration sand?
  - *The sand removes pathogens to make the water safe to drink*



# Review

2. What does the biolayer do?

- *Helps removes pathogens*



# Review

## 3. Why is the diffuser so important?

- *To protect the biolayer when water is being poured into the filter*
- *If the diffuser is not there, the biolayer will be disturbed. If the biolayer is not working well, the filter will not treat water as well*

