

Name: \_\_\_\_\_

Date: \_\_\_\_\_

### **Public Drinking Water Treatment Process Explained**

Water Filtration Data Sheet: Student Prepared Filter

Original observation of sample:

Filter design (what materials were used and in what order):

Observation of water after filtered:

***Filtration and Screening Directions:***

Each group of 3-4 students will need the following:

- “Dirty” water sample
- Plastic spoon/spatula
- Funnels
- Sand and gravel
- Screens
- 100 mL, 250 mL beakers
- Graduated cylinder (Note: the graduated cylinder gives the most accurate volume reading)
- Data sheet (*See Attachment 2.4-C*)

**Explore the Screening and Filtration Steps in the Conventional Drinking Water Treatment Process.**

1) Work with your team to make a filter using a funnel containing sand and gravel. Add  $\frac{1}{2}$  spoonful of gravel to the funnel and then top it off with 2 or 3 spoonfuls of damp sand. Level the top of the sand so that the sand is compacted. Leave approximately  $\frac{1}{4}$  inch between the top of the sand and the top of the funnel. Set the funnel aside.

2) Mix the “dirty water” sample in the large beaker and then pour out 100 mL into the small, 100 mL beaker. Observe what happens to the water over two to three minutes. Do some particles sink to the bottom? Do some particles float to the surface?

3) Using a screen to cover the top of the larger glass beaker, carefully pour the dirty water through the screen and into the empty beaker. Pour the water from the beaker into the graduated cylinder to get a more precise measure. Record the volume and note any changes to the water on the data sheet. Set aside the screen. Rinse the 100 mL beaker for re-use.

4) Take your funnel filter and pour the dirty water sample through the sand filter and collect the filtrate in the clean 100 mL beaker. If you want a more accurate measurement, transfer your filtered water to the graduated cylinder for a more accurate measurement. Note the volume and any change in the water on the data sheet.

5) Filter the water through the sand a second, and even third, time and record your results.

Things to think about:

How did the water change after filtration?

Why is screening important?

Why is filtration important?

Could you make your screen or your filter even more effective? How?

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### Public Drinking Water Treatment Process Explained

#### Water Filtration Data Sheet

Starting volume of water: \_\_\_\_\_

Observation of original sample (clarity, particulates, etc.):

Sample	Volume	Percent Loss of Volume	Observation of water sample (clarity, particulates, comparison to original)
After Screening			
After Sand Filtration			
Additional Filtration			

To determine the percent loss of volume, use the following equation:

$$\frac{\text{Original Volume} - \text{Second Volume}}{\text{Original Volume}} \times 100 = \text{Percent Loss}$$