

# Filter It Down



Topic: Water  
Grade: 7  
Duration: 30 - 45 minutes

*Students will be challenged to create a water filter system of their own.*

## **Curriculum Expectations**

- 7s28: Distinguish between mechanical mixtures and solutions
- 7s37: Use appropriate vocabulary, including correct science and technology terminology, to communicate ideas, procedures, and results
- 7s44: Demonstrate different methods of separating the components of mixtures
- 7s46: Identify the sources and characteristics of pollutants that result from manufacturing and agricultural systems
- 7e2: Use writing for various purposes and in a range of contexts, including school work
- 7e5: Produce pieces of writing using a variety of forms (e.g., descriptive, narrative, and expository compositions), techniques and resources appropriate to the form and purpose, and materials from other media (e.g., diagrams, illustrations)
- 7e37: Plan a research project and carry out the research

## **Background Information**

Lakes, streams and ground water are not pure water. Both nature and people deposit substances into the water. Tiny organisms can grow in the water that can make people very sick. Water must be treated to make it safe for people to use.

In a water treatment plant, water is taken in and the larger objects, such as sticks and fish, are screened out. Then the water is pre-treated with chemicals like chlorine to remove impurities and odours. The water is mixed to distribute all chemicals evenly. The water is allowed to sit so coagulation can take place. Coagulation occurs when all the chemicals and impurities settle to the bottom of the holding tank and are removed. Water is then filtered through sand, gravel and hard coal (anthracite). Additional filters are used to remove toxic organisms. Chlorination is then added to prevent bacteria from forming. Sometimes, fluoride is also added. Then the water is stored and distributed when needed.

## **Accountability**

Students will be able to identify the steps necessary to create clean water for community needs.

## **Teacher Notes**

1. Materials: funnels, cotton, gauze, sand, gravel, coffee filters, tape, jars of really dirty water, holding jars for "treated water", scissors, note paper, scissors, pencils, etc.
2. Discuss the importance of really clean water. Share the steps needed to filter water.
3. Challenge the student in "water companies" of three or four to use some of the supplies available to create a water filter.
4. Speed is not as important as clearness of water at the end of the process.

5. Document processes and results.
6. Warning: Just because they have cleared the murky water does not mean the water is good to drink at this point. There are still micro-organisms to be dealt with for water to be drinkable.

### ***Extension***

Go to a water treatment plant to see their processes on a larger community scale.

### ***Home Extension***

1. Try using objects around the house to filter water. Create you own filter and compare its clear water ability with purchased filter, like Brita. Check with parents before using purchased filters for murky water samples.

### ***Lesson Comments***

What did your students find?

How did their opinions of water use change after the sewage treatment plant?

What creative filter plans did they come up with?