

## Water Filter Challenge

**Problem:** What filtration system design will work best to clean the contaminated water?

As a team, you have been hired to build the most efficient water filtration system using the given items. **\*Your team may only use a total of 8 different items to construct your filtration device (this does not include the 2-liter soda bottle).\***

### Materials Available :

Gravel (2 cups)	Cotton ball
Sand (2 cups)	2-liter soda bottle (cut in ½)
Activated Carbon (2 cups)	Rubber band
Sponge	Duct tape
Coffee Filter	Filtering cloth
Paper clip	
Drinking straw	Yarn (12" long)

\* Groups may bring in additional materials if they desire.

### Procedure:

1. Research: As a group research water filtration system. What might be some useful questions you can research to help you learn more about water and water filters?
2. Synthesis & Planning: Using the information you found in the research step, as a group brainstorm filtration system ideas.
3. Create your (visual) Hypothesis:
  - Draw a large, neat & detailed diagram of your water filtration system.
  - Label the materials used in the diagram.
4. Explain your Idea: In no less than one (1) paragraph, explain your hypothesis by answering the following questions.
  - Why do you think your design will work?
  - Why did you decide to choose each item?
5. Construction: Construct your water filtration system.
6. Sharing Ideas: Your group will share and explain your water filtration system (both diagram and constructed system) with the class.
7. Testing: With the help of your teacher, test your water filtration system.

# Water Filter Challenge Planning Sheets

**Step One: Research.** Write 3 useful questions you can research to help you learn more about water and water filters?

Q 1:

A 1:

Q2:

A2:

Q3:

A3:

**Step 2: Synthesis and Planning.** Using the information you found in the research step, as a group brainstorm filtration system ideas. What materials are you going to use to construct your filter?

**Step 3: Create your (visual) Hypothesis.** Draw a large, neat, and detailed diagram of your water filtration system. Make sure to label each of the materials used in your diagram.

**Step 4: Explain your Idea.** In no less than one (1) paragraph, explain your hypothesis by answering the following questions. Why do you think your design will work? Why did you decide to choose each item?

Observations: Contaminated Water (before filtration)

Quantitative Data:

Qualitative Data:

**Results:** (after filtration)

**Quantitative Data:**

**Qualitative Data:** Write at least ten (10) detailed observations of the "filtered" water that has gone through your filtration system.

**Summary & Analysis:** In no fewer than 5 complete sentences, describe the success of your water filtration design. Were you successful? Why do you think so?

\* Be sure to use both quantitative and qualitative data to support your success statement.

**Summary & Analysis:** Describe two things you would change if you were to re-build and improve your water filtration system.