Name: **Date:** **Class:**

Wastewater Design Project Info Sheet

As environmental engineers, job is to design a wastewater treatment plant to clean water before it is discharged into the environment or used for drinking water. As part of the water-cleaning process, you also want to reclaim as much material (such as plastics) from the wastewater as possible.

Wastewater Contaminants List

Today, you will test your design on simulated wastewater that contains:

- 1.5 liters water
- 5 grams coffee grounds
- 40 grams sand
- 15 grams vegetable oil
- 1 ounce liquid soap
- 30 grams fertilizer
- 4 grams of small, brightly colored plastic

Wastewater Treatment Budget

Engineers often work within a given budget, which we call a project design constraint. Your designs must also stay within budget. Take note of the material/method costs and the reuse/resale value of any materials that you extract/reclaim from the process.

Group Budget = $1,000

Filtration Material/Method Costs

fine-grain sand = $400/kg
large gravel = $200/kg
small pebbles = $300/kg
activated charcoal = $1,000/kg
algae = $1/mg
coffee filters = $50 each
cotton mesh/cheese cloth $300/$m^2$

Value for Reuse or Resale

clean fine-grain sand = $400/kg
clean large gravel = $200/kg
clean small pebbles = $300/kg
activated charcoal = $400/kg
fertilizer= $20/g
plastic = $10/g

Reflection Questions

A. How effective at cleaning the water is your filter device? *Be descriptive!*

B. Provide evidence that your device is cleaning the water. Use test data to back up your claims.

C. Is this water safe to drink? Why or why not?

D. How would you change your device to make it more effective?

E. How could you have worked more effectively as a group to obtain higher-quality products?