Lab: Old Drippy

Objective: Determine the amount and cost of water wasted from a faucet drip by collecting, graphing, and extrapolating data.

Safety: None

Pre-Lab Questions:
Use Dimensional Analysis to solve the following problems.

1. Convert 2.67 ml/min to ml/sec.

2. Convert 0.02 liters/hour to liters/year.

3. Convert 50 cents/day to dollars/week.

Background:
Your parents probably get on you at times about such things as turning off the lights, closing doors tightly, and turning off faucets all the way. This may often be accompanied by some reference to how much money this is costing them.

People often use their skills to solve or study problems by **extrapolation**. Today you will notice that the faucets in the room are dripping. You will devise a procedure to collect information that will allow us to answer the question "How much money is going down the drain if we let that faucet drip like that for a year?" We obviously won't hang around for a year to answer that, rather we will collect some short-term information, and then **extend** (extrapolate) that information to a year's worth of dripping.

Procedure: Collect at least 5 volume-time data points. You and your partner will decide how to do this. You will be provided with some graduated cylinders and timers. You will then graph the data either by hand or on the computer. **You should submit your graph stapled to your lab credit sheet.**

Data: Create a data table below.

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Results:

1. ***Create a graph*** of the data (by hand or use Excel or another graphing program), plotted as volume vs. time, making sure to put the independent variable on the X axis and the dependent variable on the Y axis. Include a "best fit" (regression) line. The Excel program has a feature allowing you to display the equation of the line on the graph, and this should be done as well.

   Attach the graph to your Lab Credit Sheet.

2. Using your graph:
   a. Does your graph show a direct or inverse relationship? Explain how you decided.

   b. Determine the slope value from the graph, and express it in units of milliliters per second.

   c. The slope value from part b) represents the rate that water is dripping. *Convert* this value into units of Liters per day. *Show work using dimensional analysis.*