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Department

وزارةالتعليم العالي والبحث العلمي
الجامعة المستنصرية
كلية الهندسة
قسم هندسة البيئة

Experiment 1

Mass and Weight Density of water

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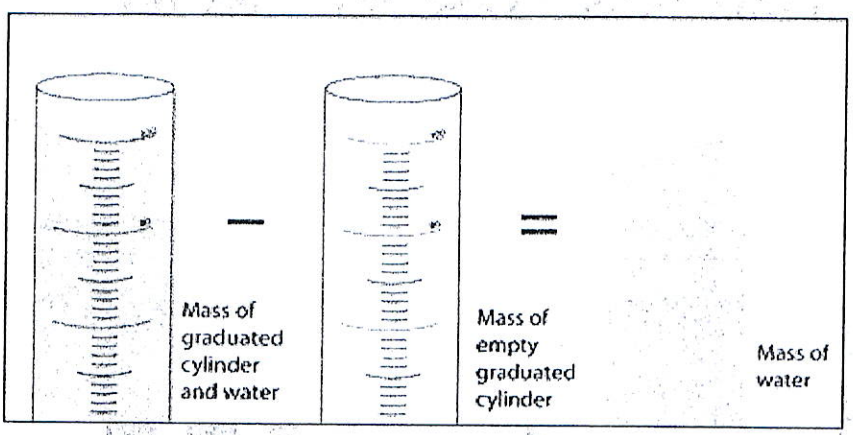
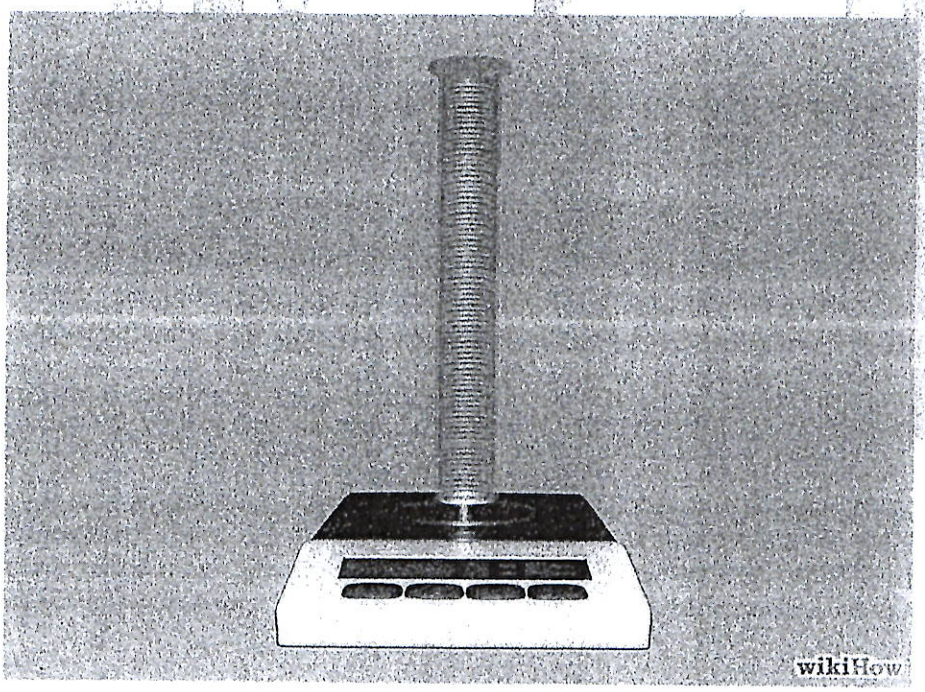
Objective:

Students will be able to measure the volume and mass of water and calculate its mass density, Then calculate the density weighted by multiplying the mass density by acceleration to the gravity (9.81 m/s^2) . Students will be able to explain that since any volume of water always has the same density, at a given temperature, that density is a characteristic property of water.

Equipments and apparatus:

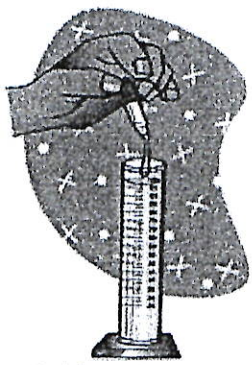
- Graduated cylinder, 100 mL
- Water
- Balance that measures in grams (able to measure over 100 g)
- Dropper





Procedure:

1. Find the mass of an empty graduated cylinder. Record the mass in grams in the chart on the activity sheet.
2. Pour 100 mL of water into the graduated cylinder. Try to be as accurate as possible by checking that the meniscus is right at the 100-mL mark. Use a dropper to add or remove small amounts of water.



3. Weigh the graduated cylinder with the water in it. Record the mass in grams.
4. Find the mass of only the water by subtracting the mass of the empty graduated cylinder. Record the mass of 100 mL of water in the chart.
5. Use the mass and volume of the water to calculate density. Record the density in g/cm^3 in the chart.
6. Pour off water until you have 50 mL of water in the graduated cylinder. If you accidentally pour out a little too much, add water until you get as close as you can to 50 mL .
7. Find the mass of 50 mL of water. Record the mass in the activity sheet. Calculate and record the density.

8. Next, pour off water until you have 25 mL of water in the graduated cylinder. Find the mass of 25 mL of water and record it in the chart. Calculate and record the density.

Theoretical background and Calculation:

Volume of water (milliliters)	100	50	25
Mass of graduated cylinder + water (g)			
Mass of empty graduated cylinder (g)			

Mass of water (g) = (Mass of graduated cylinder + water (g)) - Mass of empty graduated cylinder (g)

Mass Density of water (ρ) (g/cm^3), $\rho = m / V$

Weight Density of water (γ) (N/m^3) = (ρ)×(g)

g is acceleration to the gravity (9.81 m/s^2)