

SI Units

Name

Lab #2

Purpose

The purpose of this lab was to express measurements in SI units, read a thermometer, measure liquid volume by using a graduated cylinder, measure mass by using a balance, and determine the density of two liquids.

Hypothesis

If the thermometer in the dark colored sand in front of the light rises faster than the light colored sand, than the dark colored sand absorbs more heat, because it is darker.

Experiment Planning

The independent variable in this experiment is the sand (light and dark colored). The dependent variable is the temperature of the sand. The variables you need to hold constant is the light source.

Materials

- Graduated Cylinder, 100 mL
- Sand, light colored, 75 mL
- Sand, dark colored, 75 mL
- 2 plastic cups
- Thermometers, Celsius, alcohol-filled(2)
- Light source
- Ring stand or lamp support
- Balance
- Stopwatch
- Water, 25 mL
- Corn oil, 25 mL
- Clear plastic cup

Procedure

1. First we put on our safety goggles.
2. Then we used a graduated cylinder and measured 75 mL of light-colored sand and poured it into one of the small plastic cups. We then repeated this step using dark-colored sand.
3. We then leveled the sand in the cups and placed one thermometer in each cup.
4. Then using a lamp stand, we placed the lamp approximately 9 cm from the cups.
5. Before we turned on our lamp we recorded the initial temperature of the sand.

6. For the next ten minutes, we recorded the temperature of the sand at one-minute intervals
7. While I was recording the temperatures of the sand, my partners went on to the next part.
8. They labeled one of the plastic cups “oil” and the other “water”. Using a balance they measured the mass of each plastic cup, and recorded the value in our data table.
9. Then, using a graduated cylinder, we measured 25 mL of corn oil, and poured it into the plastic cup labeled “oil”. Then, using a balance, we measured the mass of the plastic cup containing the corn oil, and recorded the mass in our data table.
10. Then we repeated step 9 with water and the plastic cup labeled “water”.
11. Then we subtracted the mass of the empty cup from the mass of the cup and oil together.
12. After that we had to find the density of the oil by dividing the mass of the oil by the volume of the oil.
13. Next, we repeated steps 11 and 12 to find the mass and density of the water.
14. We then combined oil and water in the clear cup, and recorded our observations.
15. When we were done with the lab, we cleaned our materials.

Data and Observations

While I was recording the sand temperatures, there were many spikes and changes.

Sand Temperature

Time(min)	Sand Temperature	
	Temperature°C Dark-colored Sand	Temperature°C Light-colored Sand
Start	25	25
1	26	26
2	27	28
3	27	28
4	27	28
5	29	28
6	27	25
7	28	27
8	28	26
9	29	26
10	29	26

Density of two liquids

a. Mass of empty oil cup	8.25g
b. Mass of empty water cup	8.25g
c. Mass of cup and oil	31g
d. Mass of cup and water	32g

e. Volume of oil	25mL
f. Volume of water	25mL

Calculating Actual Mass

Oil	Item C-Item A=	22.7g
Water	Item D-Item B=	23.75g
g. Density of oil		.91g/mL
h. Density of water		.95g/mL

When we mixed the oil and water the, oil and water separated and the oil raised to the top and the water sank to the bottom. The fat from the oil also rose to the top of the oil.

The relationship between the color and heat absorption is that the darker the sand color, the more heat it absorbs.

The color of your clothes will affect your warmth on a sunny day because if you are wearing dark clothes, then you will be warmer, if you are wearing light clothes, than you will be cooler.

Conclusion

The purpose of this lab was to express measurements in SI units, read a thermometer, measure liquid volume by using a graduated cylinder, measure mass by using a balance, and determine the density of two liquids. The dark colored sand absorbed more heat than the light colored sand. In conclusion, my hypothesis was right. The light from the lamp heated the dark-colored sand faster than the light-colored sand. I think the dark-colored sand was heated faster than the light-colored sand because dark colors absorbs more heat than light colors. I have very high confidence in my results. There were no factors that affected our results. One new concept I have learned after doing this lab is how to use a balance. Another new concept I learned was how to work in intervals of one. This lab applies to real life situations such as cooking.