

SI Units

Purpose:

The purposes of this lab were to see if we could express measurements in SI units, read a thermometer, measure liquid volume using a graduated cylinder, measure mass using a balance, and determine the density of two liquids. Also we are trying to find out what color sand heats up the fastest.

Hypothesis:

If we take two different color sands then put them under light the darker sand will heat up faster because dark colors attract heat.

Experiment planning:

Independent variable: color of sand

Dependent variable: temperature of sand

Constant variables: where you put the sand, how far from the light, whether you measure in °F or °C

Size: 75ml of sand two colors, 1 trial

Materials:

1. Graduated cylinder
2. Light and dark sand
3. Plastic cups
4. Thermometers
5. Gloves
6. Light source
7. Ring stand or lamp support
8. Balance
9. Stopwatch
10. Water
11. Corn oil
12. Clear plastic cup
13. Graph paper

Procedure:

- I. Put on safety goggles, gloves, and a lab apron
- II. Measure 75ml of light and dark sand and put them in separate cups
- III. Put the thermometer into the cup
- IV. Write down temp of sand at start
- V. Put sand under lamp
- VI. Measure temp of sand every min for 10 min
- VII. Write temps in table named sand temp
- VIII. Label one cup oil and another water
- IX. Measure the mass of each plastic cup with the balance
- X. Write down weight on chart labeled density of two liquids

- XI. Measure out 25ml of oil and water and put them in the plastic cups
- XII. Find their masses and write them down on the chart
- XIII. Follow the formulas on the chart and find the density of the oil and water
- XIV. Put the oil and water together in the clear cup and record your observations
- XV. Clean up materials according to the teachers instructions

Data and observations:

When we put the light and dark sand under the light the darker sand heated up quicker because dark materials attract light and heat. When we mixed the oil and the water together the oil went to the top because the oil has less density.

Sand temp

Time	Temp °C	
	Dark sand	Light sand
start	26°	25°
1	26°	26°
2	26°	26°
3	26°	25°
4	27°	26°
5	27°	26°
6	27°	26°
7	28°	26°
8	28°	26°
9	28°	27°
10	28°	27°

Density of two liquids

a. Mass of empty oil cup		81/3 g
b. Mass of empty water cup		81/3 g
c. Mass of cup and oil		31g
d. Mass of cup and water		341/4g
e. Volume of oil		25 ml
f. Volume of water		25 ml
Calculating Actual Mass		
Oil	Item c-Item a=	22.67g
Water	Item d-Item b=	25.92g
g. Density of oil	$g \div ml = d$.9068 g/ml
h. Density of water	$g \div ml = d$	1.0368 g/ml

Conclusion:

The purposes of this lab were to see if we could express measurements in SI units, read a thermometer, measure liquid volume using a graduated cylinder, measure mass using a balance, and determine the density of two liquids. Also we are trying to find out what color sand heats up the fastest. In this experiment we found the density of two liquids and found out that dark sand heats up faster than light sand. My results do support my hypothesis so I accept it. You can see that the dark sand heats at a steady pace and the light sand almost stays the same. I think the dark sand heated up faster because dark colors attract light and heat. On a sunny day you should wear light colors to keep you cooler. The density of the oil was smaller than the density of the water so the oil floated on the water. You could infer that the density of ice is lower than the density of water. I do not think my group made any mistakes that could have affected our results. I have complete confidence in my results. The only limitation of the investigation was that we only had two colors of sand. I have learned that oil floats in water because it has a lower density. I have also learned that darker colors attract heat and light. I want to know what other liquids float in water. I also want to know what color sand would heat up faster than the dark sand.