

SI Units

Problem/ 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 to determine the density of two liquids. Another purpose of this lab was to test if the color of sand would change the temperature of it. Also to see what is heavier; oil or water?

Hypothesis:

If dark sand and light sand get put under heat, then the dark sand gets hotter than the light because light is attracted to dark colors.

Experimental Planning:

The independent variable was the dark sand vs. the light. The dependent variable was the temperature of the sand. The amount of heat needs to stay constant. In this lab there was only one trial.

Materials:

- Graduated cylinder, 100 mL
- Sand, light colored, 75 mL
- Sand, dark colored, 75 mL
- Cups, plastic, (2)
- Thermometers, Celsius, alcohol-filled (2)
- Gloves, heat-resistant
- Light source
- Ring stand or lamp support
- Balance
- Stopwatch or clock
- Water, 25 mL
- Corn oil, 25 mL
- Cup, clear plastic
- Graph paper

Procedure:

1. First we got all of our materials
2. Next we poured 75 mL of light sand into a plastic cup, and did the same for the dark sand.
3. Then we put a thermometer into the sand in each cup.
4. We placed the cups near the lamp and recorded the temperature of the each cup of sand each minute for ten minutes.
5. Then we recorded the information onto the chart.
6. Next we started Compare the Density of Oil and Water
7. Then we labeled one cup oil and other cup water.
8. We measured the mass of each plastic cup and recorded it.
9. We put 25 mL of oil into the cup labeled oil and measured the mass, then recorded it.
10. Then we put 25 mL of water into the cup labeled water and measured the mass, then recorded it.
11. Next we found the density of the oil, by using the formula m/v .
12. Then we repeated the last step using the water measurements.
13. Next we combined the water and the oil together and recorded our observations.
14. Finally, we cleaned up our materials.

Results:

When the sand went under the light the temperature slowly raised up in both cups, but the dark sand's temperature was one degree higher than the light colored sand. The experiment with the oil and water was also a success. When we measured out the oil and water, we figured out that the water was heavier. So when we poured the water and the oil together, the oil went to the top and the water sank.

Sand Temperature

Temperature		
Time (min)	Dark-colored sand	Light-colored 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	8 ^{1/3} g
b. mass of empty water cup	8 g
c. mass of cup and oil	31 g
d. Mass of cup and water	34 ^{1/4} g
e. Volume of Oil	25 mL
f. Volume of Water	25 mL

Calculating Actual Mass	
Oil	22.67 g
Water	35.92 g
g. density of oil	.9068 g/mL
h. density of water	1.0368 g/mL

Conclusion:

The purpose of this experiment was to find which was heavier; oil or water? Also, to see if color affects the temperature of sand. When we put the two different colors of sand under the light the temperatures slowly rose up, but in the end the dark sand was one degree higher than the light sand. My hypothesis was: If dark sand and light sand get put under heat, then the dark sand gets hotter than the light because light is attracted to dark colors. I accept this hypothesis. The dark sand did indeed get hotter than the light sand. If the sand was kept under the light for longer than the dark sand might of even rose even higher than the light. When we put the oil and water together in the same cup the water went to the bottom and the oil rose to the top. I think this happened because water is heavier than oil, as we figured out in our experiment. I think the dark sand got hotter because light is attracted to dark colors. I have much confidence in my results; I think the two experiments were a success. After this lab I had a better understanding of how to use a balance, and also how to calculate density. A new question I have is; if the sand was left under the light longer, would the dark sand's temperature be higher than the light by more than just one degree? Another question I have is; if you wear dark colors outside in the summertime, how much does it affect your body temperature? I could conduct more experiments to answer these questions. I could do the same experiment with the sand and leave it out longer to answer my first question. This lab was great, I learned very much.