

Calculating the Density of Coke Classic™ and Diet Coke™

Density is how heavy or light an object appears compared with another object. The density of an object is often compared to the density of water.

- If an object floats on water, it is less dense (lighter) than water.
- If an object sinks in water, it is more dense (heavier) than water.

Question

1. Which do you think is more dense: a can of Coke Classic™ or a can of Diet Coke™?

Safety Precautions

- Do not eat or drink anything in the science lab.

What You Need

10 mL graduated cylinder
digital scale or balance
355 mL can of Coke Classic™
355 mL can of Diet Coke™

What to Do

2. Use the information on the can to complete the table.

Per Can	Coke Classic™	Diet Coke™
a) Amount (mL)		
b) Calories		
c) Fat (g)		
d) Sodium (g)		
e) Carbohydrates (g)		
f) Sugars (g)		
g) Protein (g)		
h) Ingredients		

Name: _____

Date: _____

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3. Place the 10 mL graduated cylinder on the balance and “zero” the mass. This will cancel out the mass of the cylinder itself.

4. Check off each box as you do it.

- ☐ Pour exactly 2 mL of Coke Classic™ into the graduated cylinder.
- ☐ Place the graduated cylinder back on the balance and determine the mass. Record the mass in the table below.
- ☐ Remove the graduated cylinder from the balance. Pour exactly 2 more mL of Coke Classic™ into the graduated cylinder. You will have 4 mL.
- ☐ Place the graduated cylinder back onto the balance and determine the mass. Record the mass.
- ☐ Repeat until you have a mass of 10 mL of Coke Classic™ in the cylinder. Remember to record the mass each time you add 2 more mL.

5. Repeat steps 3 and 4 using Diet Coke™.

What Did You Observe?

Volume (mL)	Mass of Coke Classic™ (g)	Mass of Diet Coke™ (g)
2		
4		
6		
8		
10		

6. Graph your data on the grid paper that your teacher provides. Use the checklist to help you complete the graph.

- ☐ Title your graph.
- ☐ Title the x-axis “Volume (mL).”
- ☐ Choose a scale for the y-axis.
- ☐ Title the y-axis “Mass (g).”
- ☐ Use a red pencil to graph Coke Classic™. Join the points using a ruler.
- ☐ Use a blue pencil to graph Diet Coke™. Join the points using a ruler.

Name: _____

Date: _____

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What Did You Find Out?

7. Calculate the density of Coke Classic™. Use the formula to calculate density.

$$\text{Density} = \frac{\text{mass (g)}}{\text{volume (mL)}}$$

$$= \frac{\boxed{}}{\boxed{}}$$
$$=$$

8. Calculate the density of Diet Coke™.

9. Which Coke product is more dense?

10. Explain why you think one type is more dense than the other one.
