

Science Skills



Never taste anything or put anything in your mouth without permission!

Background Information: All matter takes up space (we call this volume, the amount of space something takes up) and has mass. density is the way we compare the amount of mass to the amount of volume. An object with a large mass and a small volume is denser than an object with a large mass and a large volume or with a small mass and a large volume. We can calculate density by dividing the mass of an object by its volume. (Mass \div Volume)

Scientists use many different skills to find out about the world. These are sometimes called science processes or process skills. Observing, predicting, measuring, collecting & analyzing data, and concluding are examples of process skills.

Materials:

Almonds	Graduated Cylinder
Wax Paper	Calculator
Triple Beam Balance	Ruler
Hershey's Chocolate Candy Bar	Water
Hershey's Chocolate Candy Bar with Almonds	Beaker

Procedure Part 1:

1. **OBSERVE:** Unwrap a plain chocolate candy bar. Use all five senses to make observations. Record the observations in the data chart. Make sure to distinguish those observations that are facts and those that are opinion.

Sense	Fact Observations	Opinion Observations
Touch		
Hearing		
Sight		
Smell		
Taste		

Procedure Part 2:

1. **MEASURE LENGTH:** Unwrap a new plain candy bar. Measure the length, the width, and the height of another candy bar in **mm**. Record these numbers on the data chart.
2. **USE MATHEMATICS:** Calculate the volume using the formula Length x Width x Height. Record in the data chart.
3. **MEASURE MASS:** Use the triple beam balance to find the mass of the square of wax paper, record in the data chart.
4. **MEASURE:** Place the candy bar on the wax paper and find the mass of the candy bar + the wax paper. Record in the data chart.
5. **USE MATHEMATICS:** Subtract the mass of the wax paper from the mass of the candy bar + the wax paper to find the mass of the candy bar. Record in the data chart.
6. **USE MATHEMATICS:** Calculate the density of the candy bar by using the $D = M/V$ or density = mass / volume.

Show your work in the cells of the chart.

Mass of Candy Bar	Length of Candy Bar	Width of Candy Bar	Height of Candy Bar	Volume of Candy Bar	Density of Candy Bar
gm	mm	mm	mm	mm ³	gm/mm

- COMPARE:** Compare the density of your candy bar to the density of the candy of the people sitting around you. Record these densities in the data chart.
- USE MATHEMATICS:** Calculate the average density of five different candy bars. Record in the data chart:

Your Candy Bar	Candy Bar # 2	Candy Bar # 3	Candy Bar # 4	Candy Bar # 5	Candy Bar #6	Average Density
gm/mm	gm/mm	gm/mm	gm/mm	gm/mm	gm/mm	gm/mm

Procedure Part 3:

- MEASURE MASS:** Place an almond on the square of wax paper and find the mass of the almond + the wax paper. Record on the data chart.
- USE MATHEMATICS:** Subtract the mass of the wax paper from the mass of the almond + the wax paper to find the mass of the almond. Record on the data chart.
- MEASURE:** Fill the graduated cylinder with water to the 50 mL level. Take an accurate reading.
- MEASURE:** SLOWLY drop in the almond. Flick the graduated cylinder to remove any air bubbles that may have formed. Take an accurate reading of the new water level. Record the volume on the data chart.

5. **USE MATHEMATICS:** Subtract 50 from the new water level to find the volume of the almond. Record on the data chart.
6. **USE MATHEMATICS:** Calculate the density of the almond. Record on the data chart.

Show your work in the cells of the chart.

Mass of Almond	Volume of Almond	Density of Almond
gm	ml	gm/ml

Procedure Part 4:

1. **PREDICT:** Knowing the density of almonds and plain chocolate, what do you think the density of chocolate with almonds will be? Write your prediction here:

2. **USE MATHEMATICS:** Calculate the density of a chocolate bar with almonds. Find the average density of at least five (5) candy bars. Create a data chart to record your results.
3. **ANALYZE DATA:** Create a **bar graph** to show a comparison of the density of a plain candy bar, a candy bar with almonds, and an almond.
4. **COMMUNICATE:** Discuss your results in a sentence or two.
5. **HYPOTHESIZE:** The density of water is 1g/mL. Which candy bar will float in water? Record your hypothesis below:

6. **EXPERIMENT:** Fill the beaker $\frac{1}{2}$ full of water. Unwrap the candy bars and test your hypothesis.
7. **CONCLUDE:** Briefly describe and explain your results in paragraph form.

Data Chart, Part 4:

Bar Graph, Part 4:

