

Metric System and Dimensional Analysis Review

Density Notes

- 1. A study was created to test the effects of jazz on people's sleep patterns. The hypothesis of the experiment was that if people listened to jazz music as they fall asleep, they will sleep for longer periods of time. For the experiment, 2 groups of people were created. One group was placed in a quiet room where they went to sleep and they were timed on how long they slept. The other group was placed in a room where jazz music played softly as they began to sleep and played throughout the night. As each group awoke, their sleep times were monitored.

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- **Dependent Variable:** _____ **Control**
Group: _____

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- **Independent Variable:** _____ **Experimental**
Group: _____

- A study was created to test the effects of fear in children. The hypothesis of the experimenters was that if babies were exposed to fuzzy bunnies and at the same time a loud cymbal was struck close behind them, then that child would be afraid of all fuzzy things. Another group of children would be exposed to bunnies without any loud noises. The study was carried out as planned and as a result, hundreds of young children developed fear of all cute furry bunny rabbits.



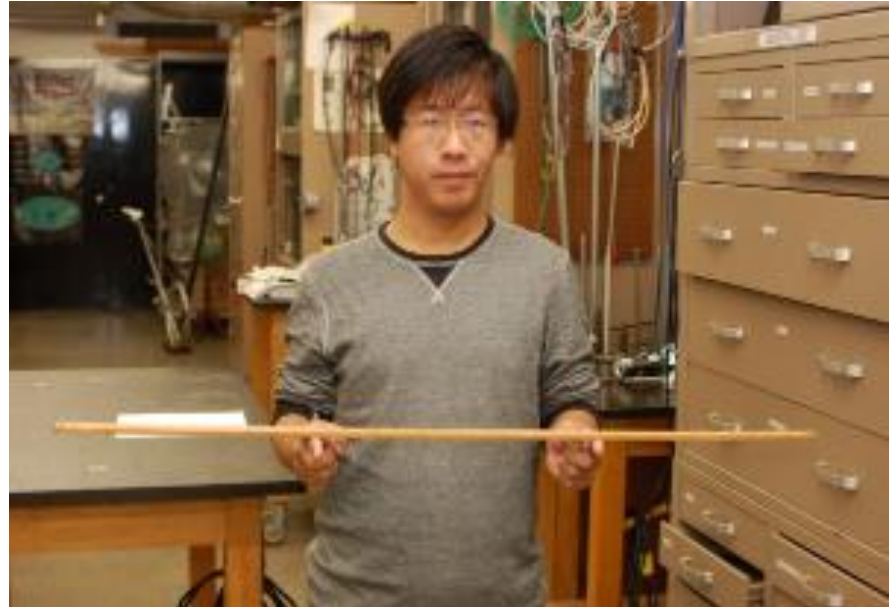
- **Dependent Variable:** _____ **Control Group:** _____



- **Independent Variable:** _____ **Exp. Group:**

Length

- Unit:
 - Meters
- Symbol:
 - M
- Tool:
 - Metric Ruler



Mass

- Unit:

grams

- Symbol:

- g

- Tools:

- Triple Beam Balance



Volume of a Liquid

- Units:

Liters

- Symbols:

- L

- Tools:

- Graduated Cylinder



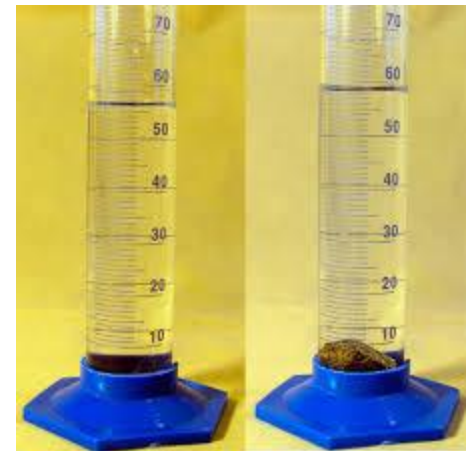
Volume of a Regular Object

- Units:
 - Cubic centimeters
- Symbol:
 - cm^3
- Tool:
 - $L \times W \times H$



Volume of an irregular object

- Units: Find milliliters and Centimeters cubed
- Symbol: $1 \text{ ml} = 1 \text{ cm}^3$
- Tool: Water Displacement



Dimensional Analysis Review

- Convert 45 mm to cm

Dimensional Analysis Review

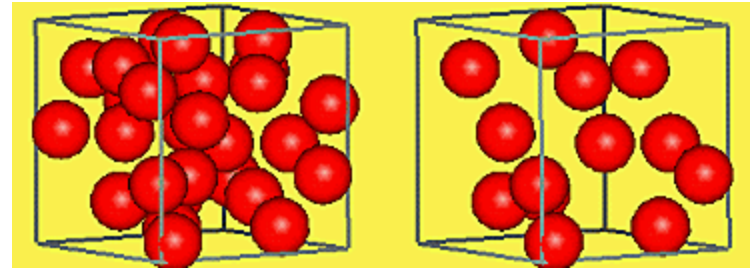
- Convert 7L to mL

- Convert 7000mL to cm^3

Dimensional Analysis Review

- Convert 0.5 km to cm

Density Notes



- Property of matter that defines how much mass is in a given area (volume)

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

- Units: g/cm^3
Or g/mL

Density Problems

A block of aluminum occupies a volume of 15.0 mL and weighs 40.5 g. What is its density?

What is the mass of the ethyl alcohol that exactly fills a 200.0 mL container? The density of ethyl alcohol is 0.789 g/mL.

A rectangular block of copper metal weighs 1896 g. The dimensions of the block are 8.4 cm by 5.5 cm by 4.6 cm. From this data, what is the density of copper?

Explain how to find the density of a box!!

- Find the mass by placing the box on the triple beam balance
- Determine the volume by measuring the length x width x height
- Calculate the density by dividing the mass by the volume