

Name _____

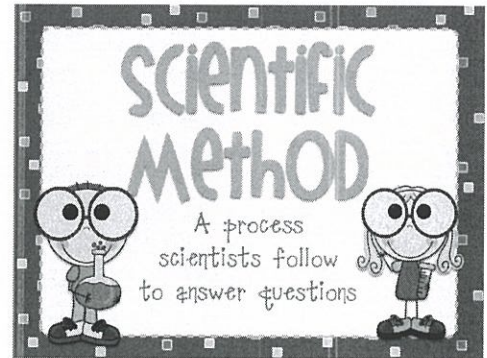
Date _____

Scientific Method

Student #/Teacher _____

Introduction and Hypothesis:

- What is the problem?
- What are you trying to find out? What do you already know?
- Make a hypothesis (educated guess) about what you think will happen.



Materials:

- A bulleted list of all the materials used in the experiment.

Procedure:

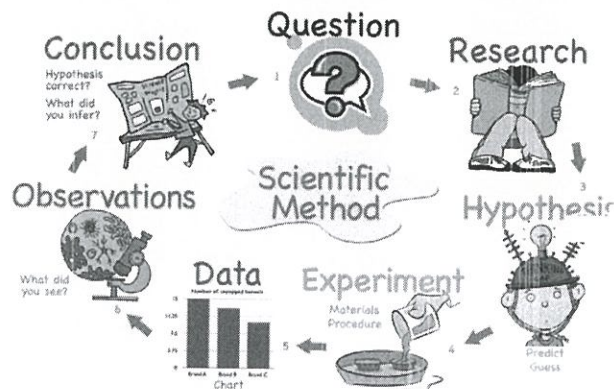
- A numbered list of all the steps involved in the experiment. Remember a good experiment only has one **independent variable**; the one part of the experiment that you are changing. Meanwhile, **dependent variables** are the changes that take place as a result of the independent variable.

Observations:

- Record what you observe/measure and collect data as you complete the experiment. This may be in the form of a chart, labeled sketch, or notes.

Analyze and Conclude:

- Explain what you learned from the experiment.
- Compare your hypothesis to the experiment's conclusion.



Name _____

Date _____



Scientific Method Vocabulary

Student # _____

hypothesis	An educated guess or prediction about what will happen in an experiment.
materials	Objects that you need to conduct your experiment.
observation	Watching and noticing events that happen during an experiment; using 2-3 of your senses.
investigation	An experiment designed to answer a question or solve a problem.
procedure	The steps you take to complete the experiment with only one independent variable.
independent variable	The part of the experiment that the scientist <u>changes</u> to test their hypothesis. Independent - I change.
dependent variable	What happens in an experiment as a result of the independent variable. You observe this change.
constants	The parts of the experiment that remain the same.
data	The information you collect from the experiment, either observations or numbers written in a table.
analyze	The part of the experiment where you examine and review the results.
conclusion	The part of the experiment where you compare the results to your hypothesis.
replicate	To repeat an experiment.
scientific method	The process scientists follow to answer a question or solve a problem.

Measuring MASS

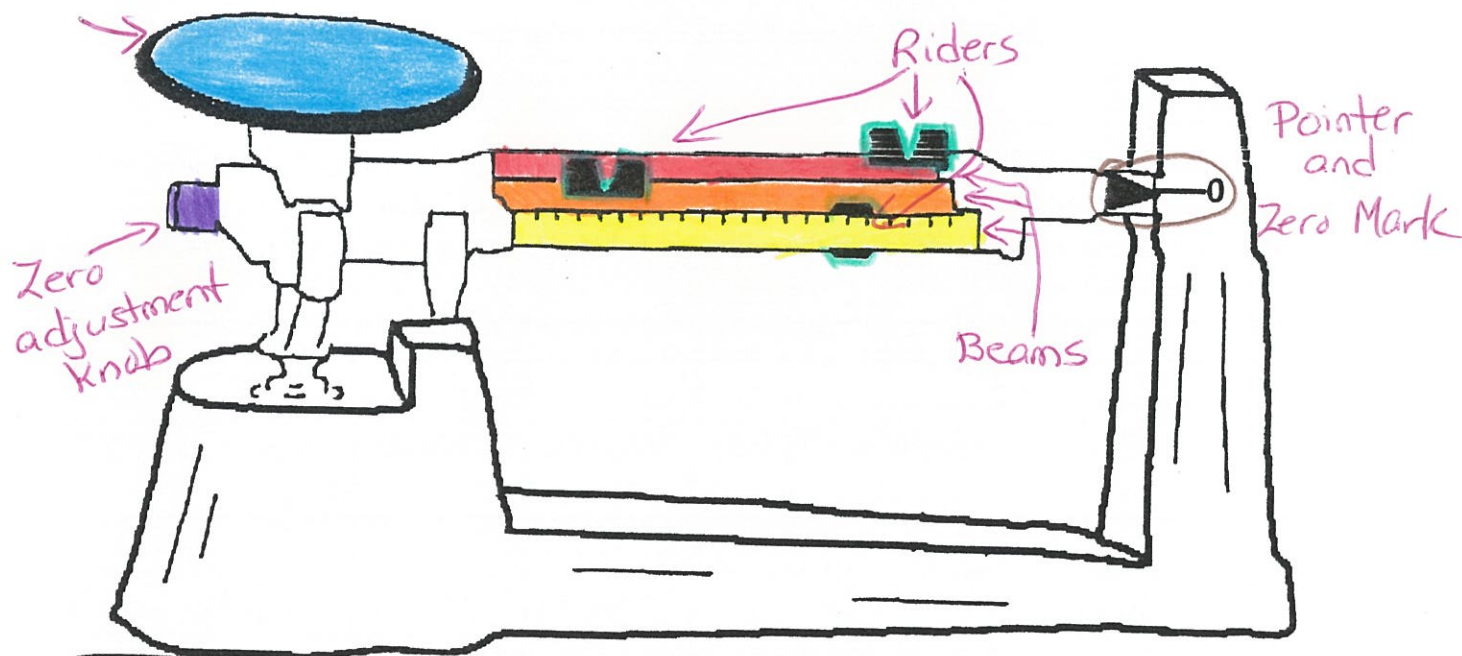
Physical Properties Practice

A scientist measures mass in order to determine the **amount of matter** in an object. **Balances** are used to measure mass in metric units of **grams** and **kilograms** (not pounds and ounces).

Name: Answer Key

Balance Pan

Let's start by taking a look at triple-beam balance.



Review the most important parts by coloring each item according to the key below. Please use **colored pencils**.

Balance Pan - This holds the object(s) being measured. (Color Blue)

Beams - There are 3 beams that hold the moving weights.

The lightest beam is located in the front. It has a 10-gram scale and a .01-gram rider. (Color Yellow)

The beam located in the middle has a 500-gram scale and a 100-gram rider and is the heaviest beam. (Color Orange)

The beam located in the back has a 100-gram scale and a 10-gram rider. (Color Red)

Sliding Weights (Riders) - Once an object is on the pan, these are moved until the balance has been zeroed out. The total mass is determined by reading each of the three riders. (Outline these in Green)

Zero Adjustment Knob - This is used to set the balance at zero when no object is on the pan and all of the riders are set at zero. Adjust this knob to ensure the pointer lines up with the zero line before using the balance. (Color Purple)

Pointer and Zero Mark - When balanced, the pointer lines up directly with the zero line. (Circle in Brown)

When you finish color-coding, label each of the parts in your picture using neat arrows.

Name _____

Scientific Tools

Date _____

Student #/Teacher _____

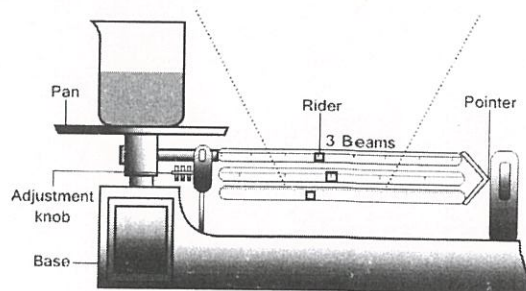
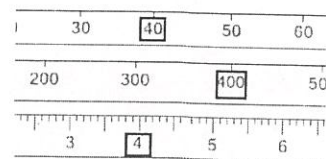
Measuring Mass and Weight

What tools are used to measure mass and weight?

Mass and weight are related, but they are not the same. You can use different tools to measure them.

Mass is a measure of the amount of matter in an object. The unit of measurement for mass is the **gram (g)**, and the tool used to measure mass is a balance.

A **triple-beam balance** has three beams. One beam measures hundreds of grams, such as 100 g or 200 g. A second beam measures tens of grams, such as 20 g or 30 g. A third beam measures single grams and parts of a gram, such as 2.3 g.



Gravity is a force of attraction between two objects. The amount of force depends on the mass of each object. Gravity attracts you to Earth, for example. Earth's mass is far greater than yours, so its pull on you is much stronger than your pull on Earth. The amount of Earth's force pulling you or any object toward its center is called weight. The unit for measuring weight is the **newton (N)**.

A **spring scale** measures weight. When an object is suspended from the scale's spring, the spring stretches. How much it stretches depends on the object's weight. Because weight is related to mass, some spring scales measure both properties.



Name _____

Scientific Tools

Date _____

Student #/Teacher _____

Measuring Volume of Regular and Irregular Shaped Figures

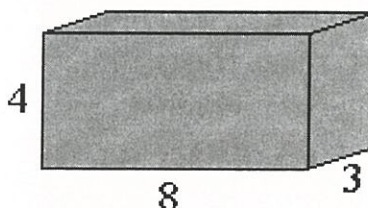
What is volume? The **volume** of an object is the amount of space it takes up.

What tools are used to measure the volume of a regular shaped figure? You can use a **metric ruler** to take measurements and use a **mathematical formula** to find the volume of a **rectangular prism**. Find the length (L), width (W), and height (H), then multiply. Remember: The units are always **cubed** for this method.

Ex: $V = L \times W \times H$

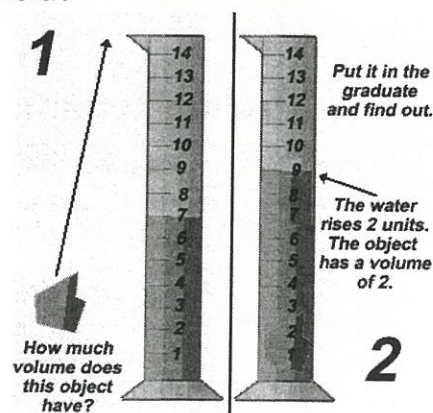
$$V = 8 \times 3 \times 4$$

$$V = 96 \text{ units}^3$$



What tools are used to measure the volume of an irregular shaped figure? You can often use a **graduated cylinder (graduate)**, **measuring cup**, or **beaker** to measure the volume of an irregular shaped figure with the **water displacement method**.

- 1) Measure the beginning water level.
- 2) Carefully drop the object in.
- 3) Measure the new water level.
- 4) Subtract the new water level and the starting water level.
- 5) Label your answer, usually milliliters (mL)



Remember: When observing the water level, read the **bottom** of the **meniscus**, which is the curved surface.