What Is Science?

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What is science?
So many things.

The study of stars—
Saturn's rings.
The study of rocks—
geodes and stones—
dinosaur fossils,
old-chipped bones.
The study of soil,
oil, and gas.
Of sea and sky,
of seed and grass.
Of wind
and hurricanes
that blow;
volcanoes,
tornadoes,
earthquakes,
snow.

What is science?
the study of trees.
Of butterflies
and killer bees.
Glaciers, geysers,
clay, and sand;
mighty mountains,
the rolling land.
The power of trains—
planes that soar.
Science is this
and so much more.
So into the earth
and into the sky;
we question
the how
the where
when
and
why.

What is Physics?

Unit 1

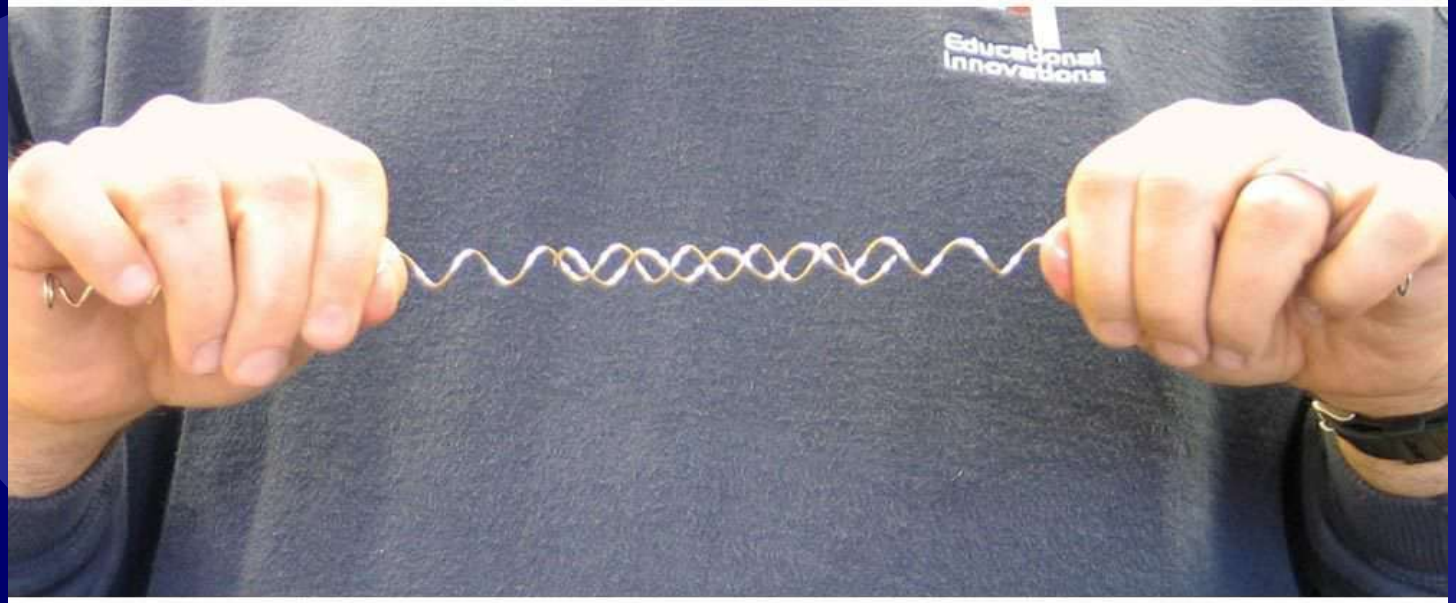
- Physics is the study of the physical world.
- Any problem that deals with temperature, size, motion, position, shape or color involves Physics.

- 7 Areas of physics include: **Mechanics, Thermodynamics, Waves, Optics, Electromagnetism, Relativity, and Quantum Mechanics**

Scientific Method

- Observe
- Hypothesis
- Test or Experiment
- Conclusion

Wire



GeoGuessr.com

Cup and Water

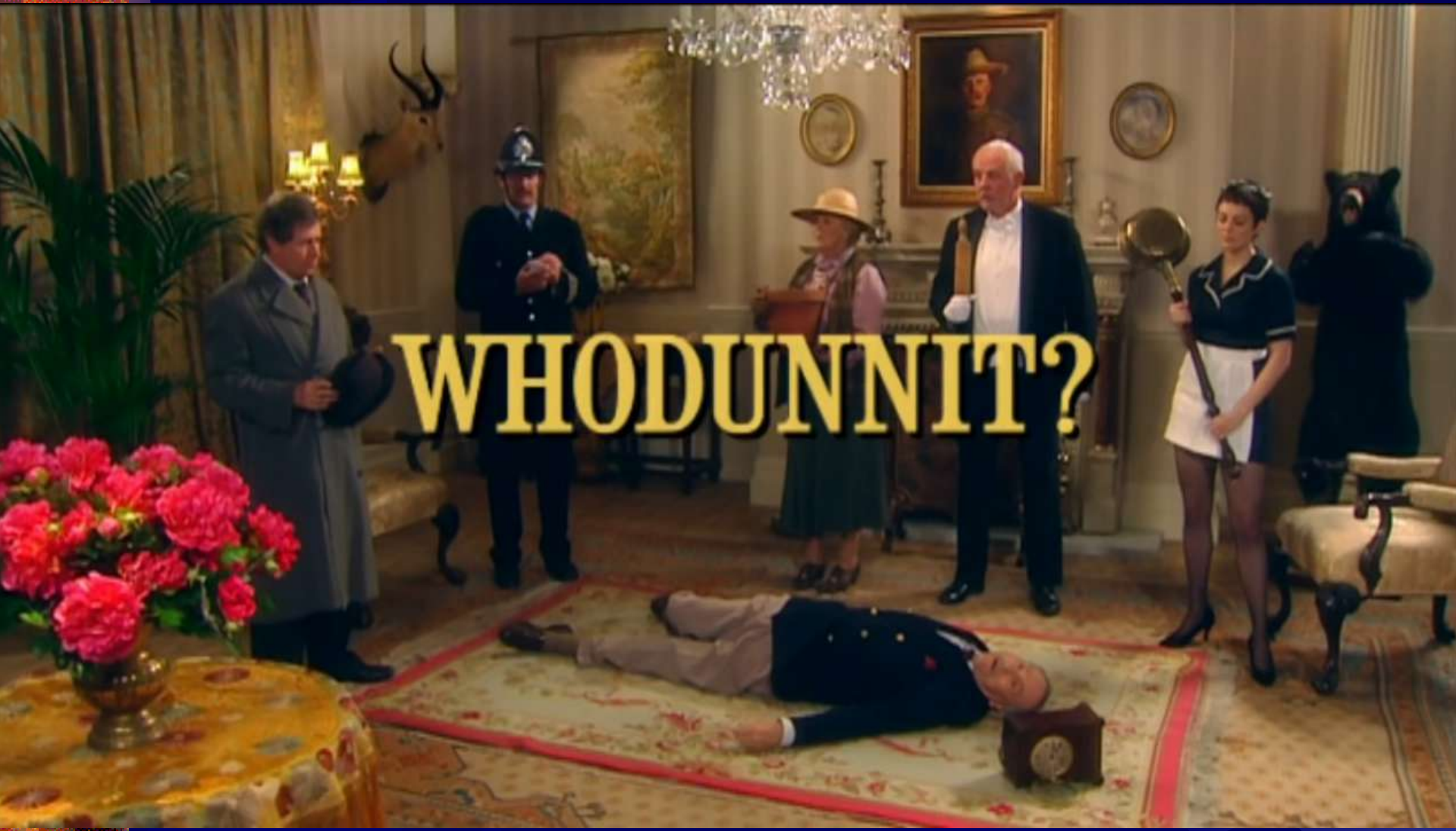
Flask and Pencil

Flash Paper

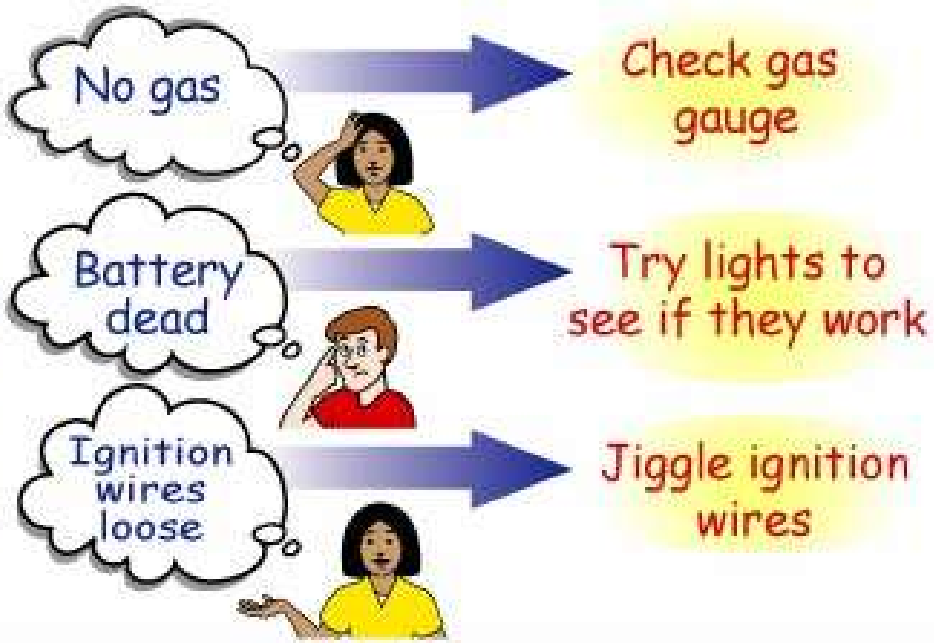
Fortune Fish

Magic Sand


skyone
PRESS


WHODUNNIT?

Scientific Method



Steps in the scientific method

STEP	EXAMPLE
1. Ask a question.	1. Why doesn't the car start?
2. Formulate a hypothesis.	2. Maybe the battery is dead.
3. Design and conduct an experiment.	3. Turn the lights on to test the battery.
4. Collect and analyze data.	4. The lights go on.
5. Make a tentative conclusion.	5. Battery is OK.
6. Test conclusion, or if necessary, refine the question, and go through each step again.	6. Are the ignition wires loose or wet?


01:12 21:42

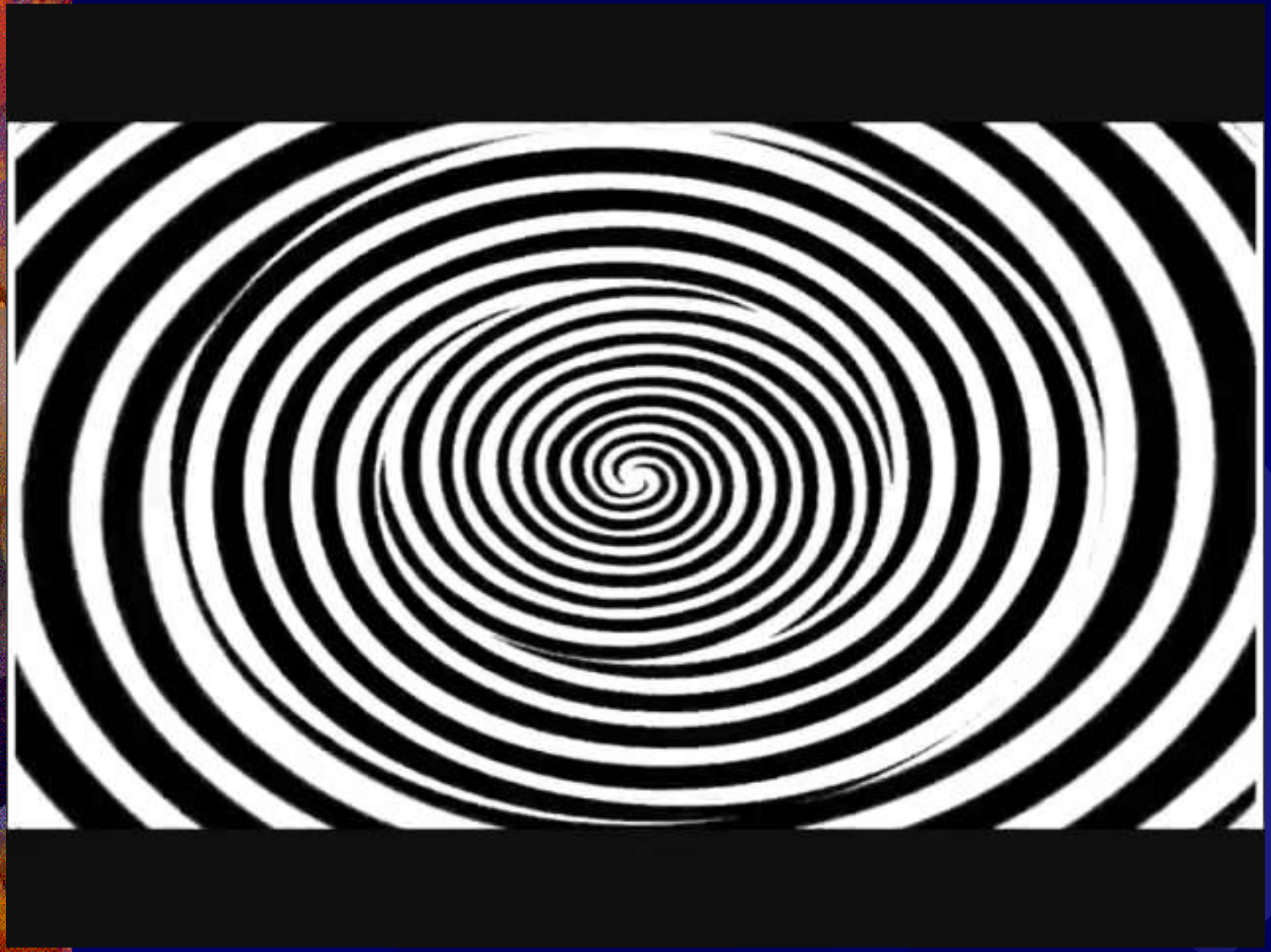
- **Model** – a replica or description designed to show the workings of an object or system.
- **Controlled Experiment** – an experiment used to test a hypothesis and that uses variables.

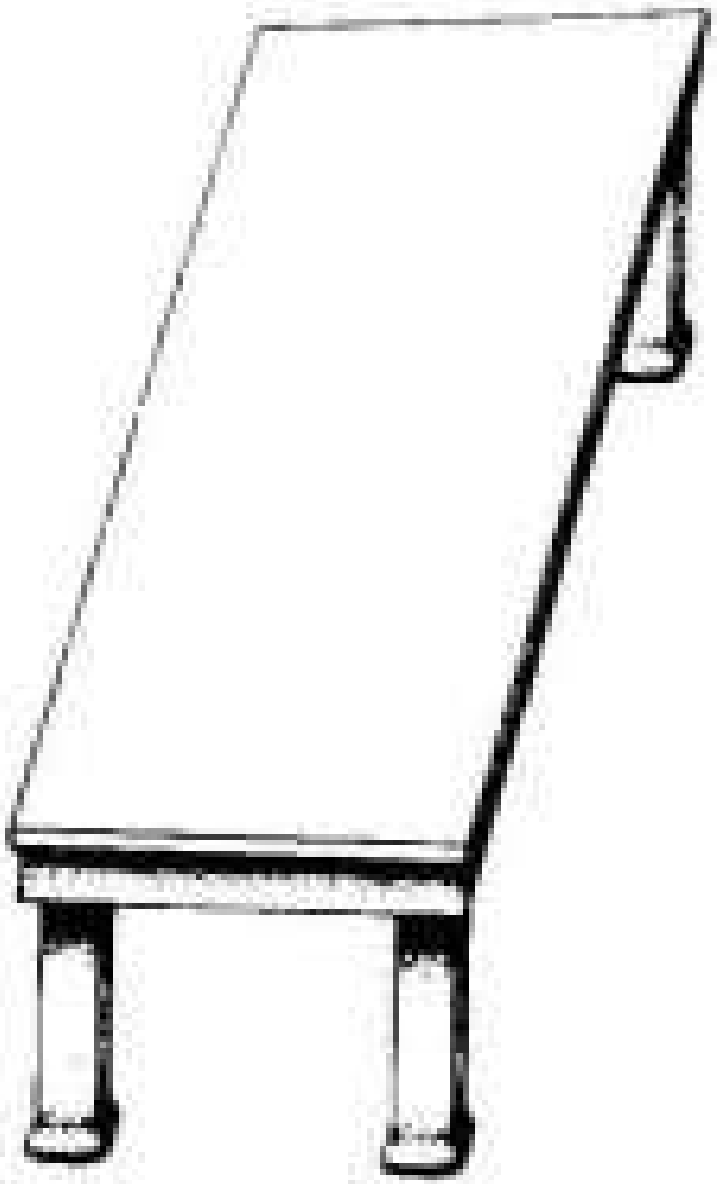
- **System** – a set of items considered separately
- **Scientific Hypothesis** – an explanation for observations

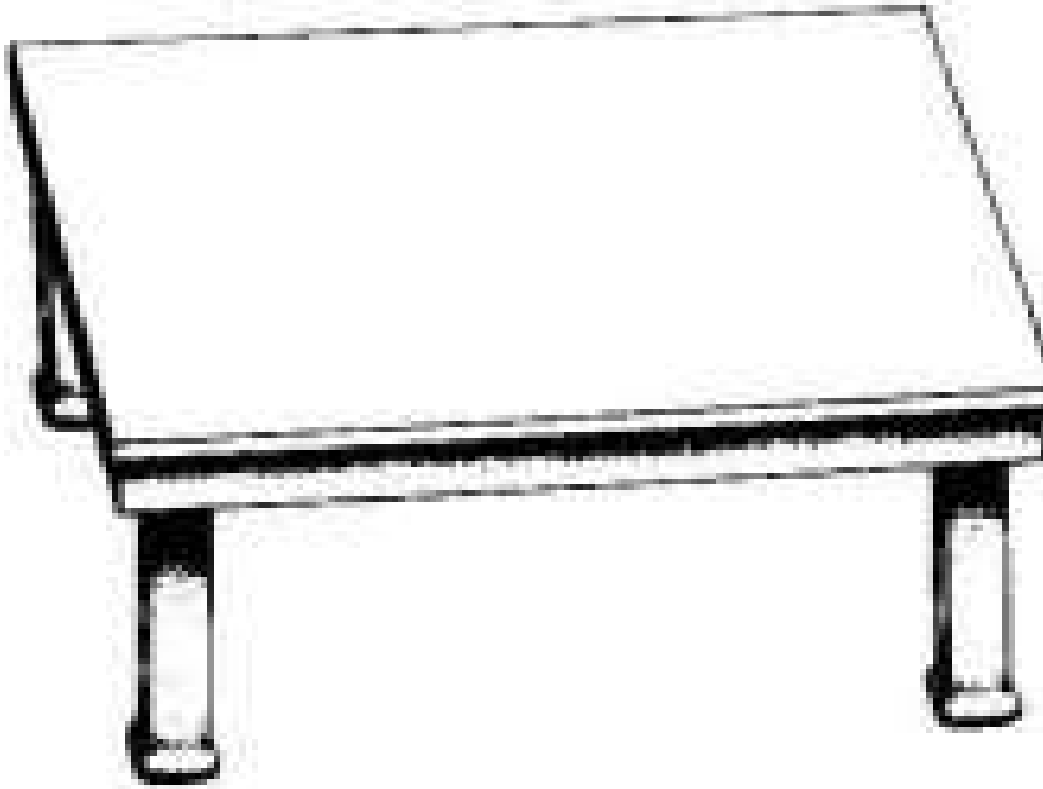
4 Types of Error

- Human Error – You screwed up!
- Method Error – Use a different method to measure each time so you get different results.
- Parallax Error – Line of Sight error
- Instrument Error – Your instrument is wrong.

Human Errors







Method Error

On July 23, 1983, Air Canada's Flight 143, with 69 people onboard, ran out of fuel at an altitude of 41,000 ft. The pilot managed to glide the plane down safely as he was very experienced glider pilot. 22,300 pounds of jet fuel had been put instead of 22,300 kg.

Parallax Error

- Hold a pencil at arms length and look at it with one eye closed. Now close the open eye and open the other. Notice how the pencil appears to shift.
- This is an example of Parallax Error and can cause mistakes in measurements when reading meter sticks and other equipment.

Instrument Error

Notes Day 2

Measurements of Physics

- **Precision** refers to the degree of exactness with which a measurement is made – measured with same result 3 times.
- **Accuracy** describes how close a measured value is to the true value.

- The description of what kind of physical quantity is represented by certain measurement is called **dimension or units**.

SI Base Units include

Length	**Meters**	m
Volume	**Liters**	L
Mass	**Kilogram**	kg
Time	**Seconds**	s
Temperature	**Kelvin**	K

Derived units are units that are formed by combining base units.

Derived Units

- All other units are **derived** from the base units.
- Speed is length / time = **meters/seconds**

- **SI** is the standard measurement system used for science.


$1,000,000
$500,000
$300,000
$175,000
$100,000
$50,000
$25,000
$10,000
$5,000
$2,000
$1,000
FOX


PG
ROADLOK
SILVER STA

Conversions in 6 steps

- 1. Write the number and unit given
- 2. Write a x ------- = after the number and unit
- 3. Write the unit you want to get rid of on the bottom
- 4. Write the unit you want to get on the top
- 5. Plug in the numbers given you that are equal
- 6. Do the math

Convert 50 miles to feet.

5280 feet = 1 mile

1. Write the number and unit –

50 miles

2. Write a x ------- = after the number and unit

50 miles x --------- =

3. Write the unit you want to get rid of on the bottom

50 miles x ---------- =

miles

4. Write the unit you want to get on the top

$$50 \text{ miles} \times \frac{\text{feet}}{\text{miles}} =$$

5. Plug in the numbers given you that are equal

$$50 \text{ miles} \times \frac{5280 \text{ feet}}{1 \text{ mile}} =$$

- 6. Do the math

$$50 \text{ miles} \times \frac{5280 \text{ feet}}{1 \text{ mile}} = 264000 \text{ ft}$$

Miles cancel out since they are opposites - multiply 50 x 5280