What is Science?

Topics

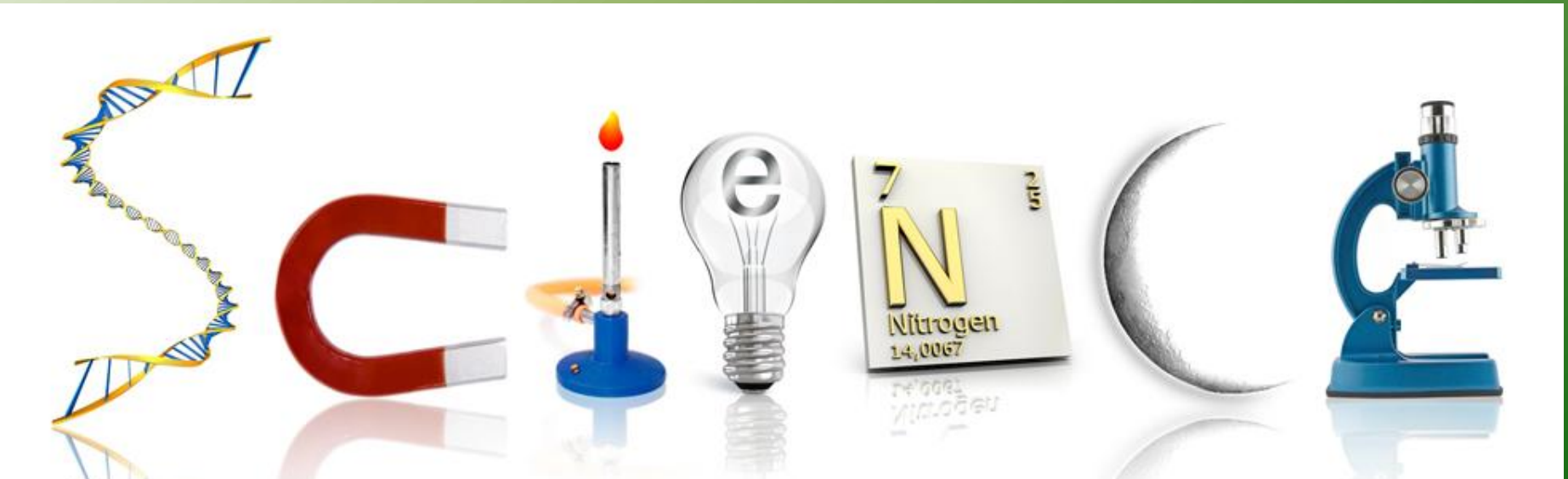
1. What is Science?
2. What is Scientific Inquiry?
   a) Scientific Method
   b) Scientific Theory
   c) Scientific Law

- **Science** – from the Latin verb *scire* = **"TO KNOW"**

- "Curiosity is the foundation of science!"

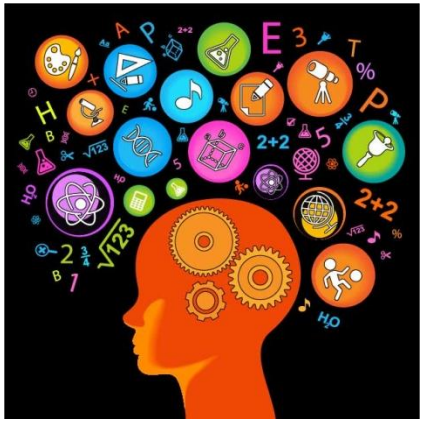
- All science is based on two assumptions…
  1. The natural world behaves in a consistent and predictable manner

  2. Through careful study, we can understand and explain patterns in nature and predict the future.



What is Scientific Inquiry?

To investigate and explain **our world**



- We know that the weather is warmer in the Summer, BUT do we know why?
- We know the internet works, BUT how?

*There are three main parts in scientific inquiry

Part 1=Scientific Method

The first part to investigating and explaining!

Definition= A system of methods and procedures that **use evidence** to explain the natural world's behavior

Example: We want to investigate the following:

Why is the grass always greener on the other side…..of the yard?

Use the Scientific Method!

Steps to the Scientific Method

1. PROBLEM
2. RESEARCH
3. HYPOTHESIS
4. EXPERIMENT
5. ANALYZE
6. CONCLUSION

State the

1.PROBLEM(Observation)

The grass is always greener on the other side of the yard

2. RESEARCH(Question)

Which properties of soil make grass greener?

3. HYPOTHESIS (Prediction):

If, then statement

If we test both soils, **then** the soil on the other side will have a greater number of nutrients than our soil

If we test the amount of sunlight received on the both soils, **then** the soil on the other side will receive more sunlight than our soil

Hypothesis – a possible explanation based on observations (not experiments)

- Must be tested, analyzed, and retested
- If repeated testing fails, hypothesis should be discarded

Example:

Einstein's static universe- the universe is not expanding.

….Then came Hubble

4. EXPERIMENT (Test)

1) Test the soil nutrients on our side and the other side

2) Test the amount of sunlight received by soil on our side and the other side

3) Test the amount of water in the soil on our side and the other side

5. Collect and **ANALYZE** data

	Our Side	**Other Side**		
% of nutrient A				
% of nutrient B				
% of nutrient C				
% of sunlight received				
% of water content				
Totals:				

Data- Is it accurate AND precise?

- **ACCURACY:** providing a correct reading or measurement.
  - In science it means '**correct**'.
  - A measurement is accurate if it correctly reflects the size of the thing being measured.

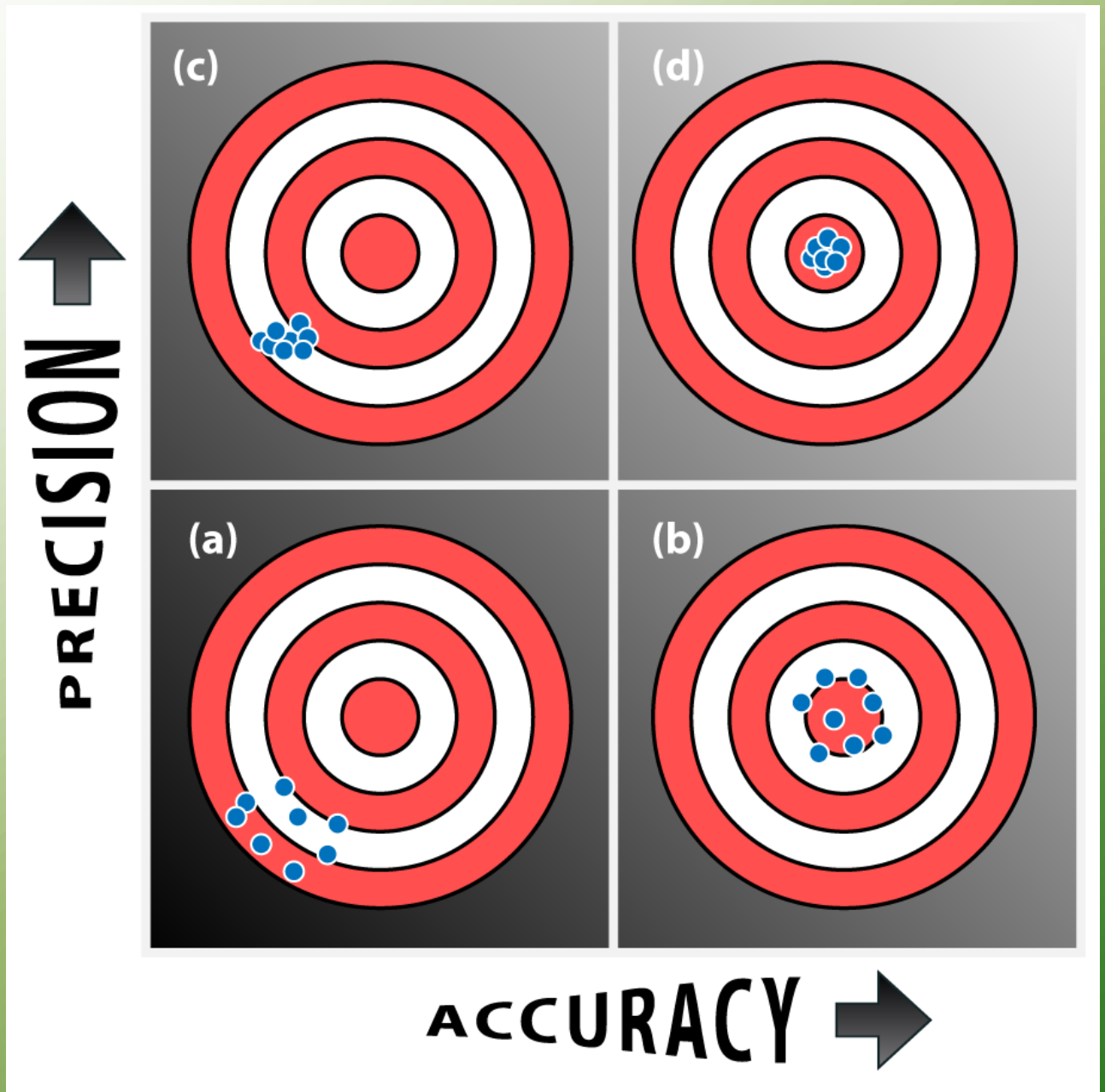
- **PRECISION**:
  - In science it means repeatable, **reliable**, getting the same measurement each time.
    -Even if it isn't correct!

Q:What is the goal of analyzing data?

A: To be accurate and precise

That means to get the correct results(accurate) every time (precise)

Accuracy & Precision are both vital



6. CONCLUSION

Answer your question:

Why is the grass greener on the other side?

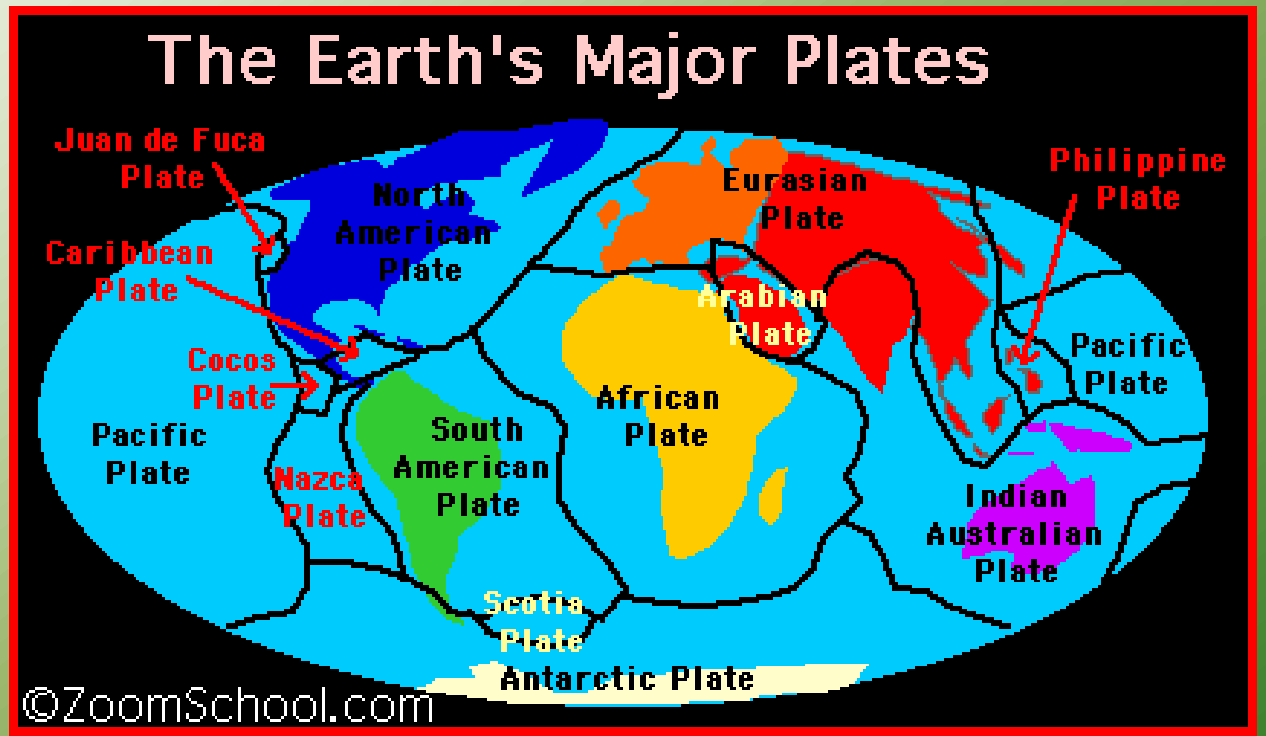
Based on research and experiments, the grass is greener on the other side due to …….

Step 2=Scientific Theory

Best explanation for certain observed facts

- **Widely accepted** by scientific community

*After the Scientific Method is performed

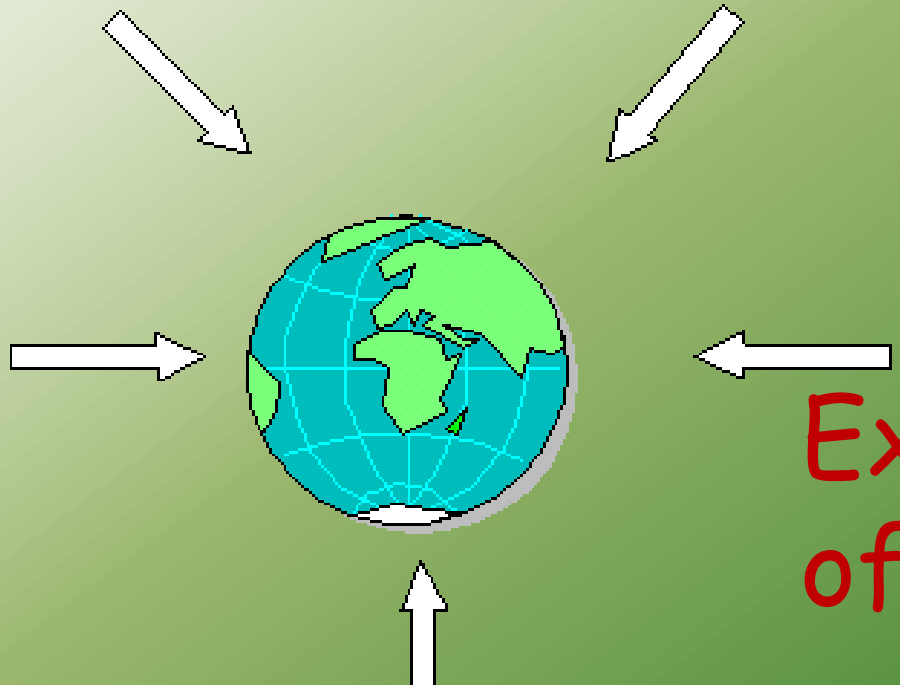


Example: The Theory of Plate Tectonics

Step 3= Scientific Law

- Universal facts of the natural world

- Can still be disproved if evidence is found!



Example: The Law of Gravity