

## CLAIM

a statement that expresses an answer or conclusion to a problem or question

## EVIDENCE (measurable)

scientific data that is appropriate and sufficient to support the claim

## REASONING (answers why)

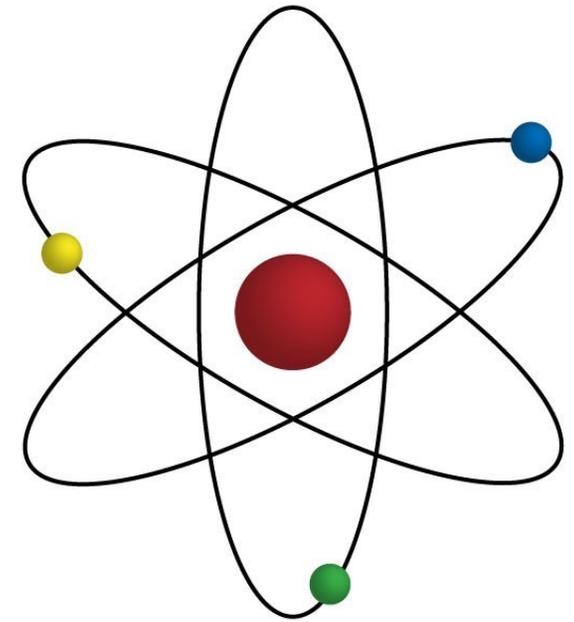
scientific principles that logically connect the evidence to the claim; a justification that shows why the data counts as evidence to support the claim

FOR EXAMPLE...

**Claim:** Water cannot be compressed.

**Evidence:** If the chamber of a syringe holds 35ml of water, the plunger will not be able to move closed or at all.

**Reasoning:** In order for matter to be compressed, there must be empty spaces between the particles. Water does not have many empty spaces because it is a liquid.



# GUIDE TO THE INQUIRY PROCESS AND SCIENTIFIC THINKING

a Mr. Yorke Creation  
[micah.yorke@dvusd.org](mailto:micah.yorke@dvusd.org)  
[myorke.ebackpack.com](http://myorke.ebackpack.com)  
[fossweb.com](http://fossweb.com)

NAME \_\_\_\_\_

**VARIABLES** are any factors that can change in an experiment.

If you have more than one variable to test, you won't know which variable caused the results. So, make sure both your experimental group and control group are the same except for one variable.

The **INDEPENDENT VARIABLE** is also known as the *manipulated variable* because it is the one you change on purpose. It is the cause.

The **DEPENDENT VARIABLE** is also called the *responding variable* because it is what you measure as a result of what you changed. It is the effect.

**CONSTANT VARIABLES** are those that need to be kept the same in both the control and experiment group or the test will not be accurate.

A scientific observation is true no matter who makes the observation. It is not based on opinion.

**Qualitative Observations** use the five senses.

*Example: The table has a smooth surface.*

**Quantitative Observations** use measurement, including temperature, mass, volume, and density.

*Example: The density of water is 1g/cc.*

A *Hypothesis* is an idea or explanation for an observation or scientific problem that can be tested by further investigation. (If...then...because...)

An **INFERENCE** is a logical conclusion based on available evidence or prior knowledge. Inferences are used to generate your hypothesis.

### **THE TESTING GROUPS**

The **CONTROL GROUP** is used for comparison and does not receive the manipulated variable.

The **EXPERIMENTAL GROUP** is the tested group and does receive the manipulated variable.

## **SCIENTIFIC PROCESS**

1. Determine the problem or question
2. Research
3. Generate a hypothesis
4. Plan the experiment
5. Test the experiment
6. Collect and record data
7. Draw conclusions
8. Reflect and Revise
9. Pose New Questions