Intro to Earth Science

Observations, Inferences, Classification

What is used to make an observation?

the five senses

Scientific Instruments (Help with observations)

	Common Instrument
Volume of Regular, Rectangular Objects (a box)	ruler
Volume of Irregularly Shaped Objects (rocks)	graduated cylinder
Mass	scale
Distance	ruler
Time	stop watch

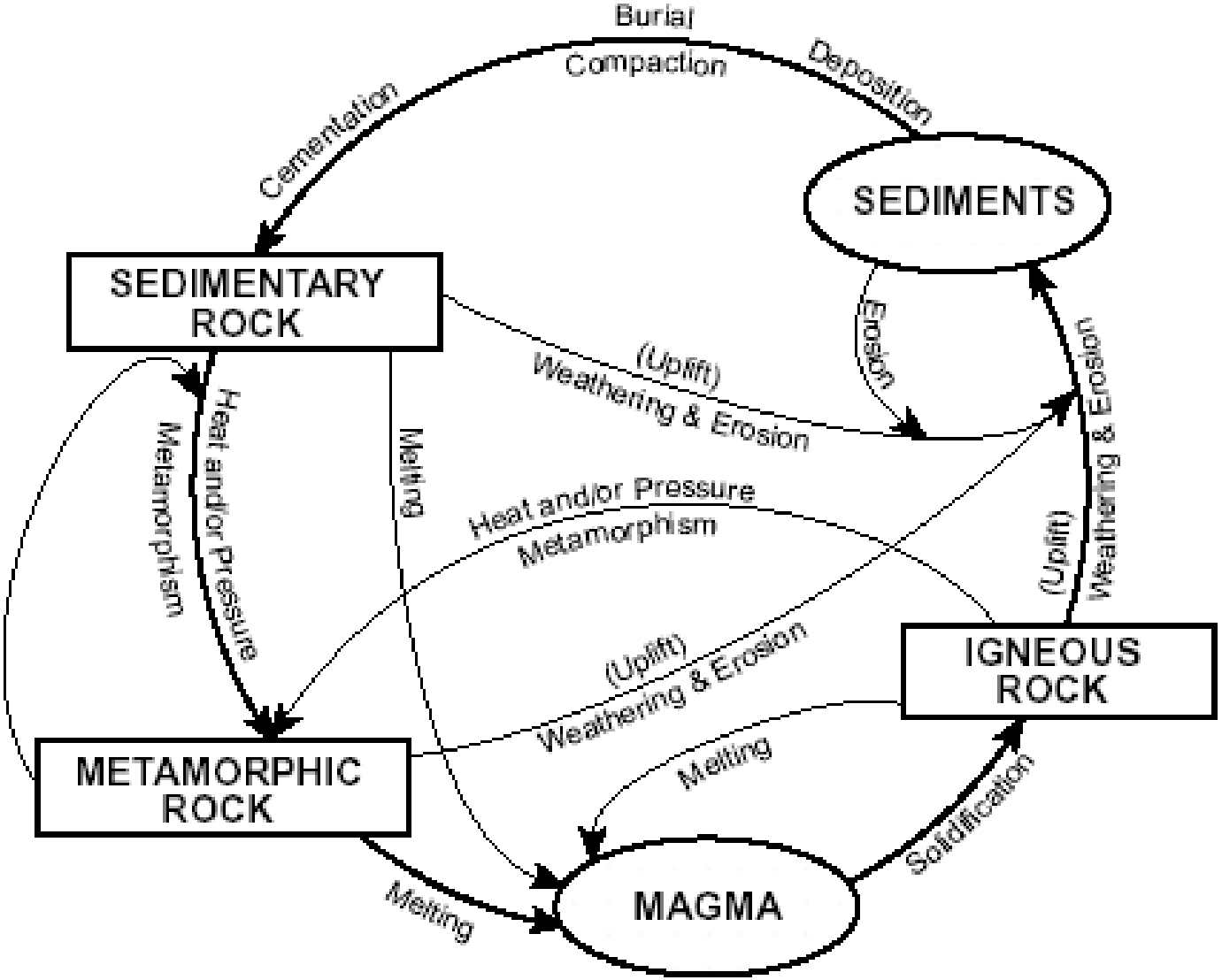
After observations have been collected. What does it mean to make an inference?

make an educated guess (an hypothesis)

We use the observations made to classify objects.

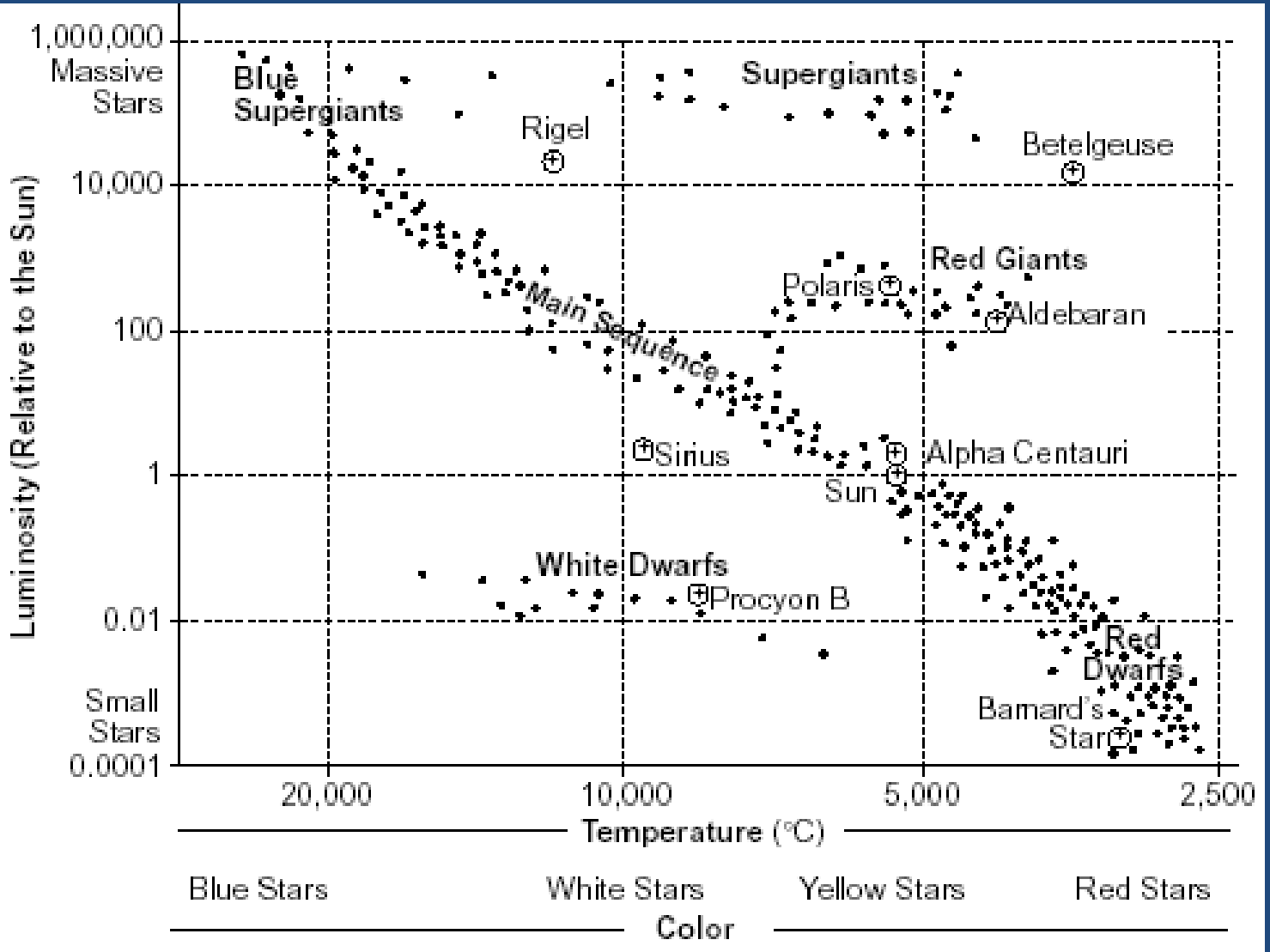
Give some examples of how you use classification systems.

Give examples of how scientists use classification systems.



Types of ROCKS

Give examples of how scientists use classification systems.



Types of STARS

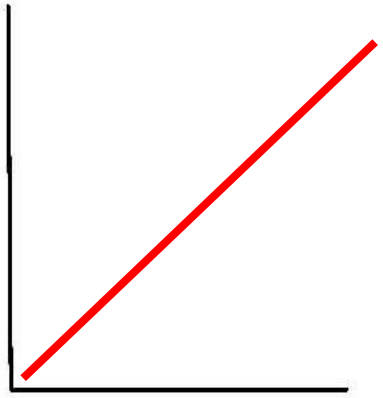
Complete pages 3 and 4 in Notes Packet

YouTube Videos 1.1

Graphical Relationships

A. Direct Relationship.

As one variable increases, the other **increases**.

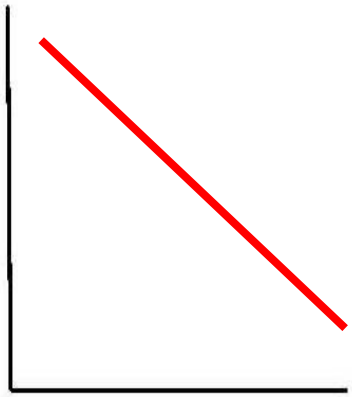


Examples:

- Population vs. Pollution
- Hours you study vs. Grades

B. Inverse Relationship

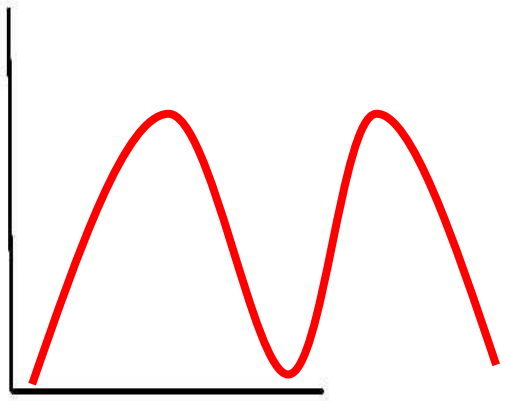
As one variable increases, the other **decreases**.



Examples:

- Distance vs. Magnetic Attraction
- Elevation vs. Temperature

C. Cyclic Relationship

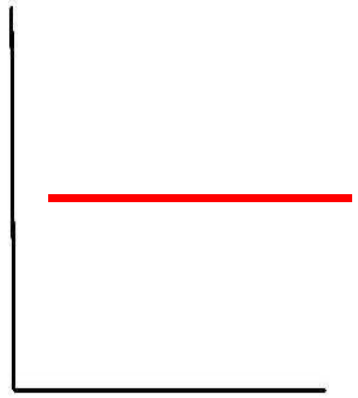


As one variable increases, the other Changes in a Pattern

Examples:
- Moon Phases
- Yearly Temperature

*Events that are cyclic are also Predictable!

D. No relationship.



As one variable increases, the other Stays the same.

Examples:
- Time vs. Mass
- Times vs. # of Planets

Complete pages 6-9 in notes packet
YouTube Videos 1.2

Earth Science Math and You
(The Basic Math You Need to Know)

1)Rounding
2)Subtracting Time
3)Scientific Notation

Complete page 10- 11 in notes packet

Rate of Change

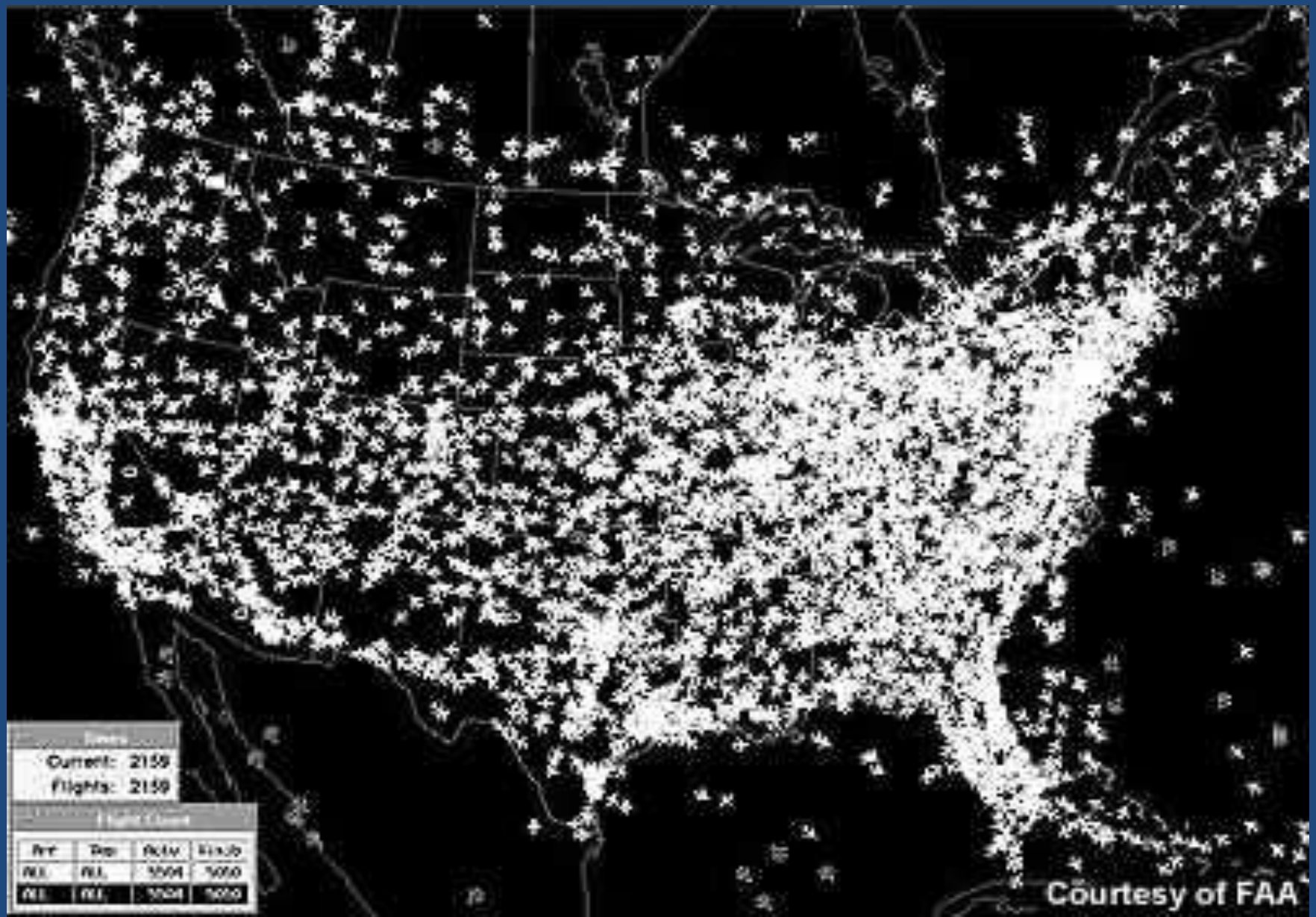
How the variable (something) changes over a period of time.

Formula for Rate of Change

$$\text{Rate of Change} = \frac{\text{change in value}}{\text{time}}$$

Complete page 12 and 13 in notes packet

DENSITY:



Density of Matter

Density: - The amount of matter in a specific volume.

- How close or compact the molecules are.

Formula:

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

* Know the Density Triangle*

A. Density Proprieties:

- **The same objects (material) have the same density.**
- **Density does not change if a material is broken in half.**

You need to Remember This!!

Cutting or breaking an object does **NOT** change its density!

Complete pg 14 and 15 in Notes Packet
YouTube Videos 1.2, ESRT1b

B. Change in Density:

Two factors that do effect density are **Temperature** and **Pressure**

1. **Temperature** As temperature increases, molecules begin to move a part (expand), which means the volume increases.

(a) Warm air **Rises** because it is **Less** dense.

An example would be a **Hot Air Balloon**

(b) State the relationship between temperature and density.

As **Temp. Increases**, **Density Decreases**

(c) Draw the relationship between temperature and density in the graph below.

Phases of Matter & Density

During which phase of matter (solid, liquid, or gas) are most materials:

most dense?

solid

least dense?

gas

Phases of Matter:

(a) Most materials have their greatest density as a **Solid**

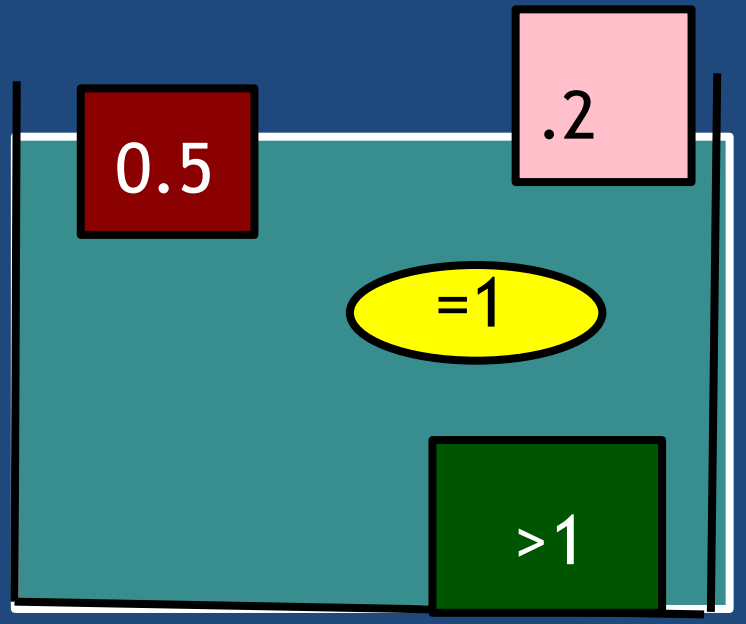
The exception is water, because water **Expands** when it freezes.

(b) Water is at its greatest density at a temperature of **3.98** °C

The density of water is **1.0** g/ml

Density

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$



(c) If an object floats on water, it is **Less** dense than the water.

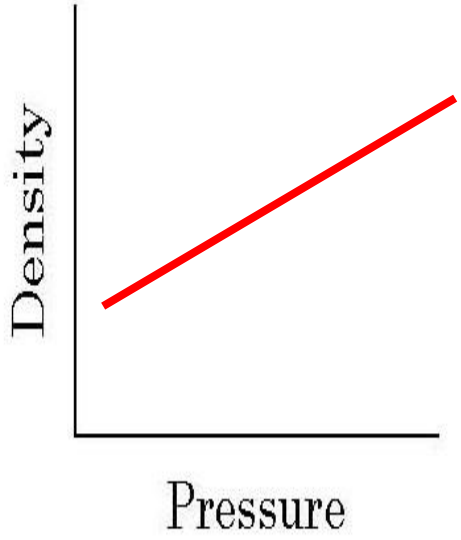
If an object sinks in water, it is **More** dense than the water.

2. **Pressure**: When pressure is added, it causes the material to become smaller (compress), volume decreases.

(a) State the relationship between pressure and density.

As **Pressure Increases**, **Density Increases**

(b) Draw the relationship between pressure and density in the graph below.



Complete pages 17– 20 in Notes Packet
YouTube Videos 1.2, ESRT1b