Intro to Earth Science

- Notes: Pages 6 - 9

Mark Place, 2009-2010

Observations, Inferences, Classification

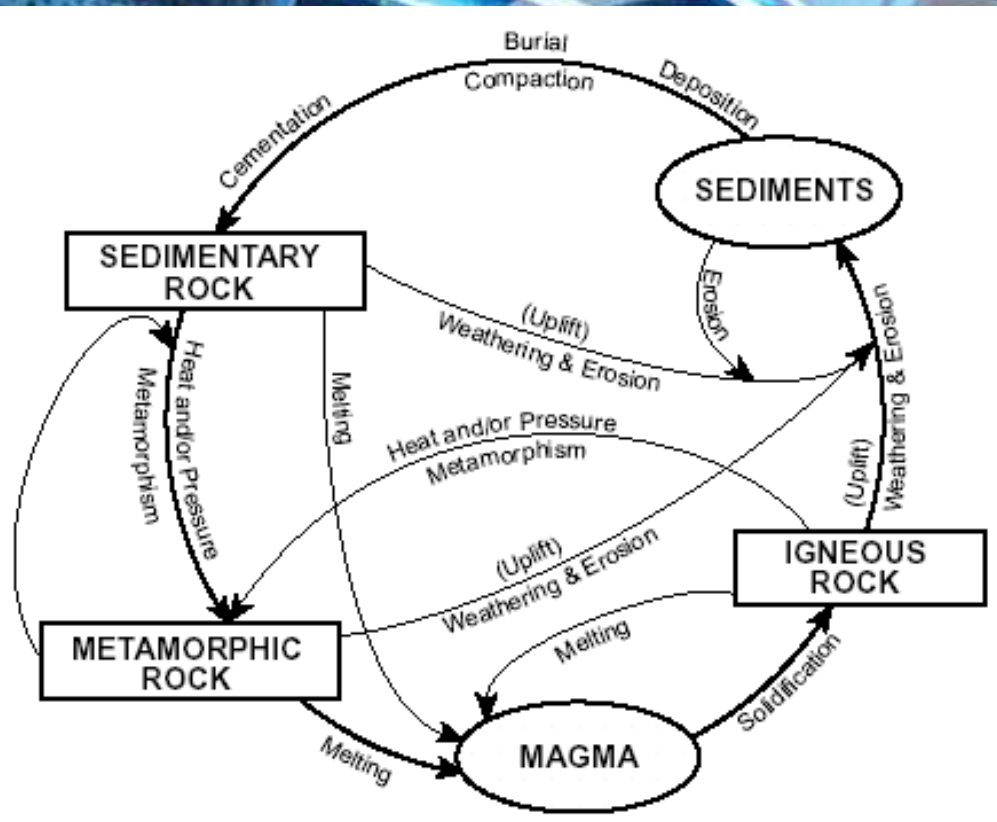What is used to make an observation?

the five senses

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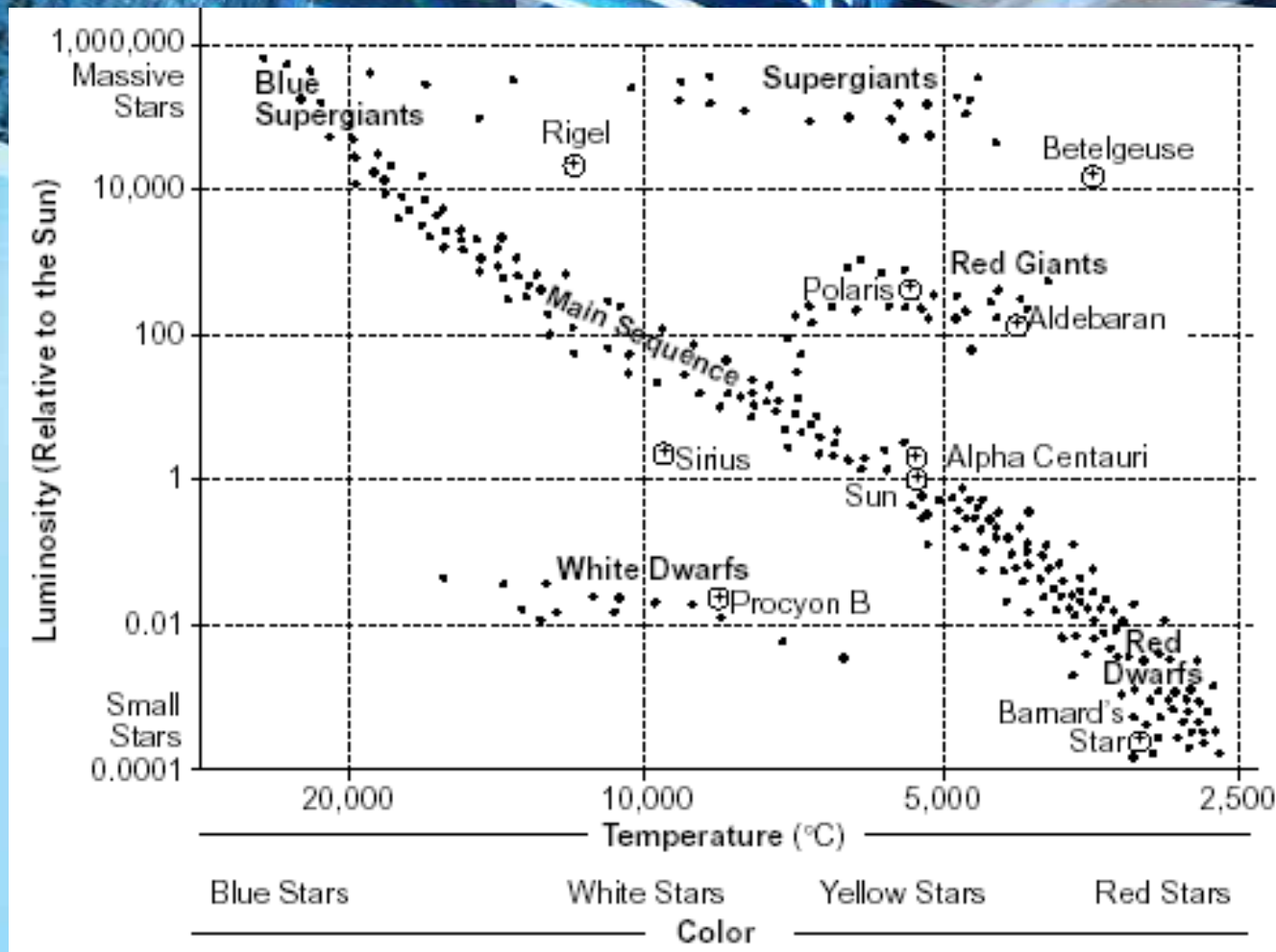What does it mean to make an inference?

make an educated guess (an hypothesis)

Give examples of how scientists use classification systems.

Types of Rocks

Give examples of how scientists use classification systems.

Types of Stars

Name the common scientific instrument used to measure mass:

scale

If an object is heated, what happens to its mass? Why?
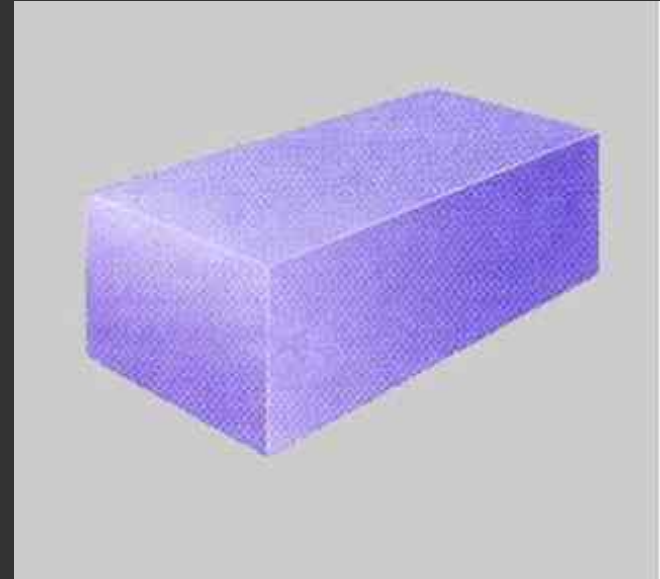
NOTHING!

THE NUMBER OF ATOMS REMAINS

If an object has a mass of 240g on Earth, its mass on the moon will be (more, less, the same). Why?

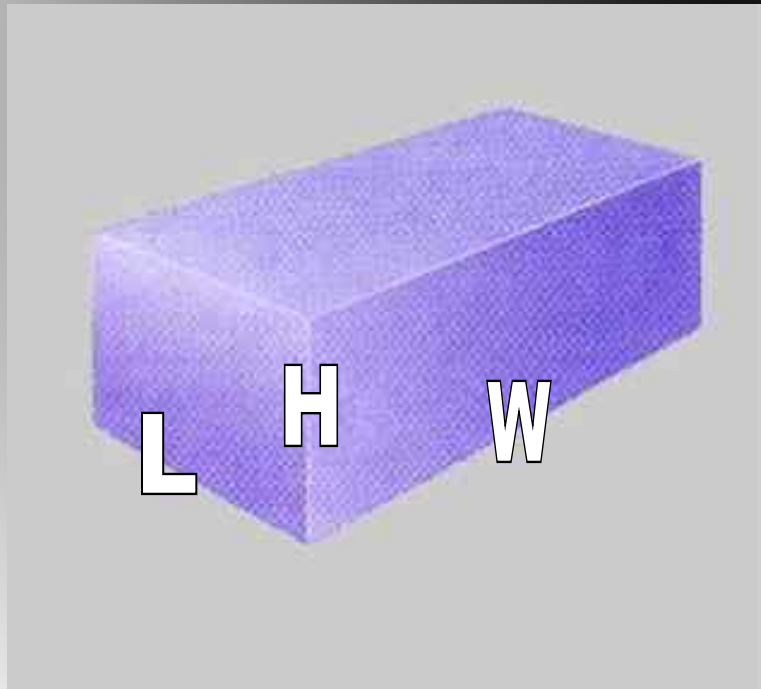the same

THE NUMBER OF ATOMS REMAINS

Volume of a regular rectangular object:

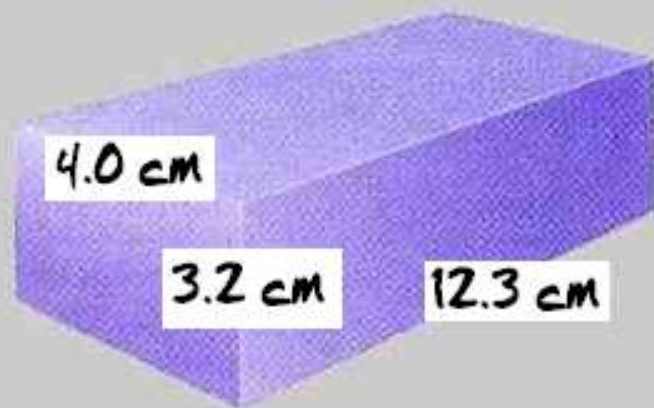What instrument would be used to measure this object's volume?

ruler

What is the formula for finding the volume of this object?
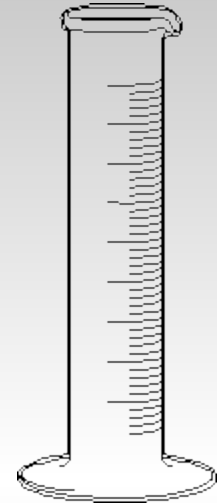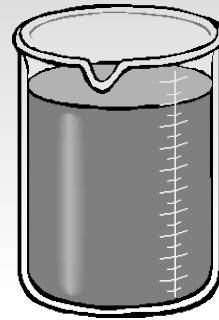
$$V = L \times W \times H$$

Calculate the volume of this object to the *nearest*
tenth of a cubic centimeter.
Show all formulas.

4.0 cm

3.2 cm   12.3 cm

V = L x W x H

= 4.0 x 3.2 x 12.3

= 157.4 cm^3

VOLUME of an irregularly shaped object:

What instrument would be used to measure the volume of an object such as a rock?

graduated cylinder
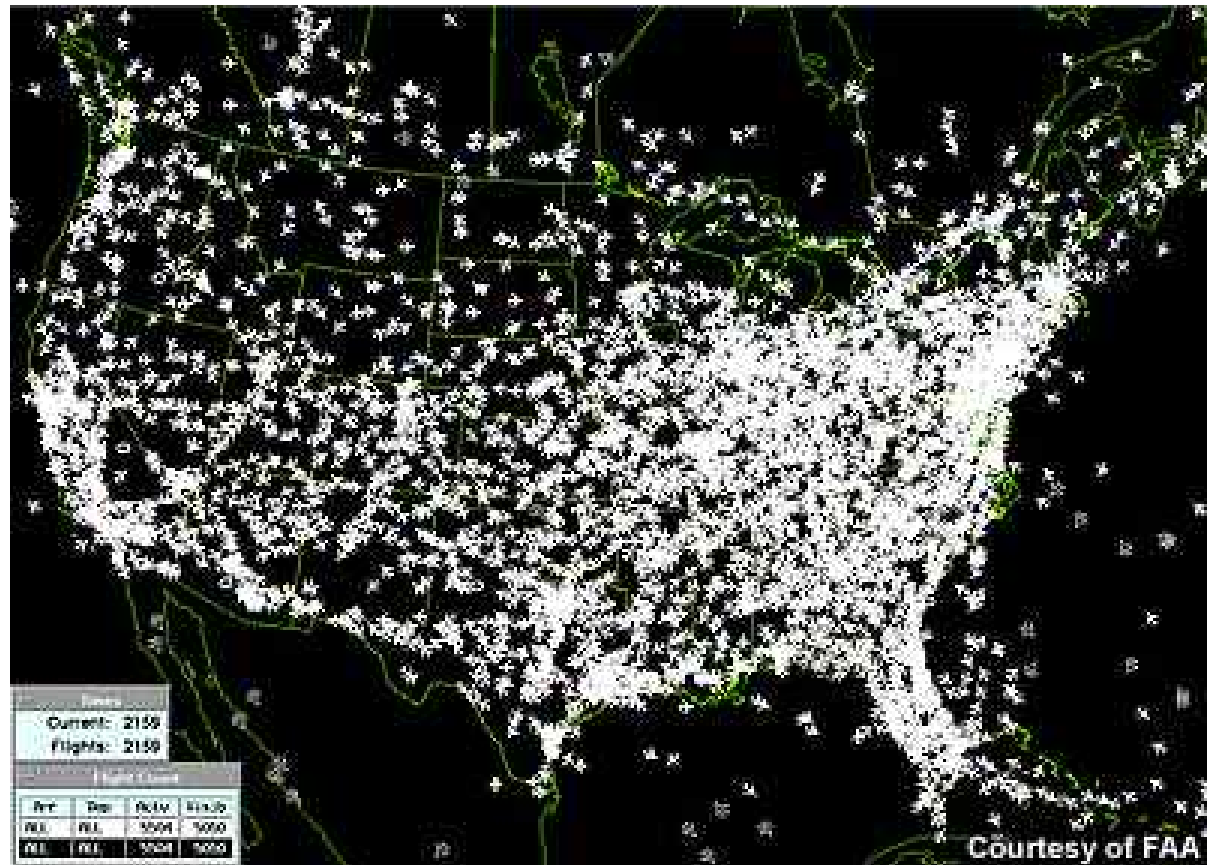
VOLUME of an irregularly shaped object:

Describe the process you would use.

- Put water into cylinder
- measure volume of water
- place object in cylinder
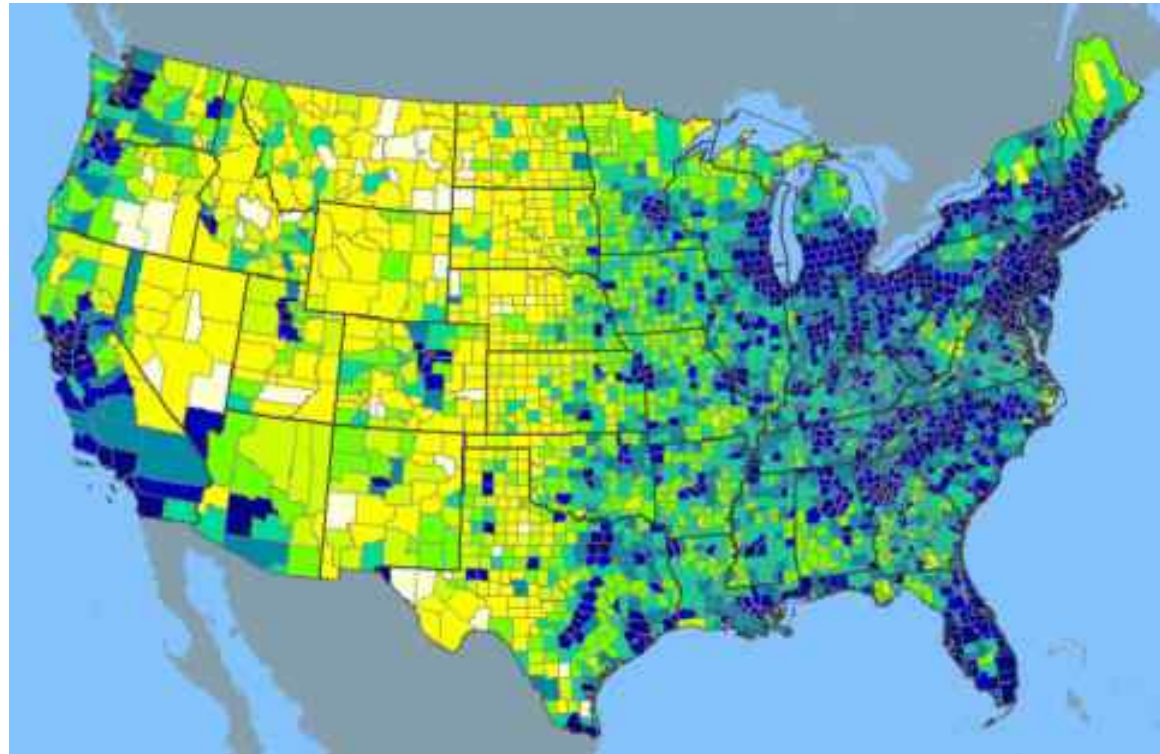- re-measure volume of water
- subtract volumes

DENSITY:
HOW TIGHTLY PACKED THE ATOMS ARE

Courtesy of FAA

DENSITY:
HOW TIGHTLY PACKED THE ATOMS ARE

Density

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DENSITY:
HOW TIGHTLY PACKED THE ATOMS ARE

When an object is heated, it

expands

and the atoms become less

packed. Therefore the object becomes

less

dense.

DENSITY:
HOW TIGHTLY PACKED THE ATOMS ARE

When an object is cooled, it

contracts

and the atoms become **more**
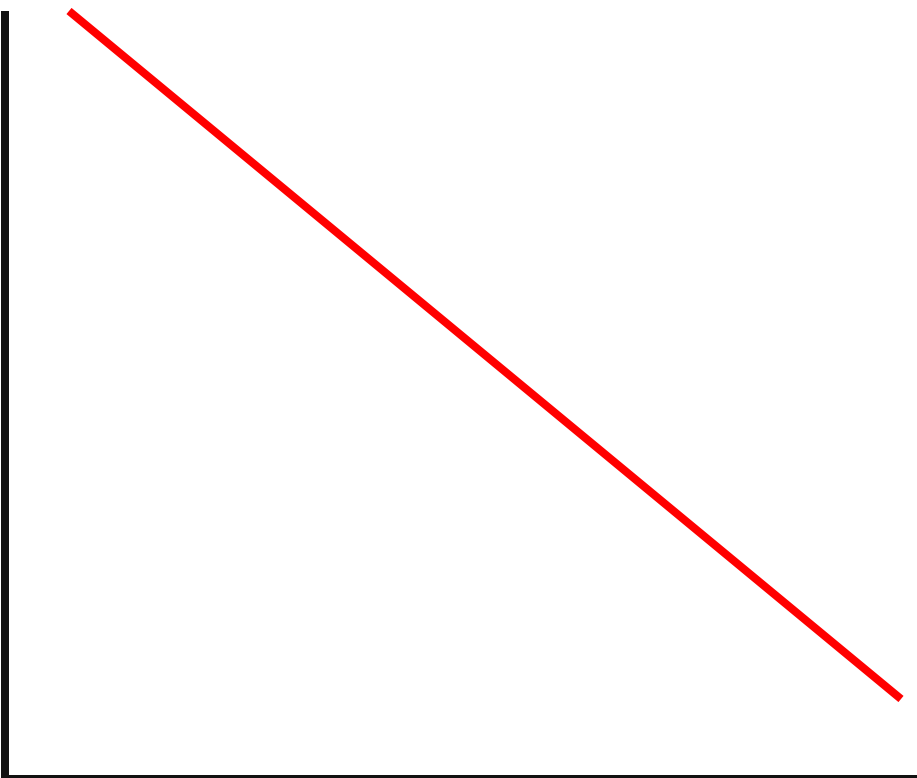
packed. Therefore the object becomes

more

dense.

Density

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density

temperature

Density

page 7

Wwhat happens to the density of an object when it is split into smaller parts? why? nothing!

the atoms are still packed the same

Wwhat is the formula for density?

density = mass / volume

A rock has a mass of 240g and a volume of 12cm³.

Showing all formulas and calculations, determine the density of the rock.

$$density = mass / volume$$

$$= 240g / 12cm^3$$

$$= 20.0 \ g/cm^3$$

The box below has a mass of 120g. Showing all formulas and calculations, determine the density of the box.

volume = L x W x H

2.0 cm

= 2.0cm x 2.0cm x 10.0cm

10.0 cm

2.0 cm

= 40.0 cm³

density = mass / volume

= 120g / 40cm³

= 3.0 g/cm³

If the empty container has a mass of 100g and the filled container has a mass of 250g. What is the density of the liquid inside? Show all work below.

100 mL

100g 250g
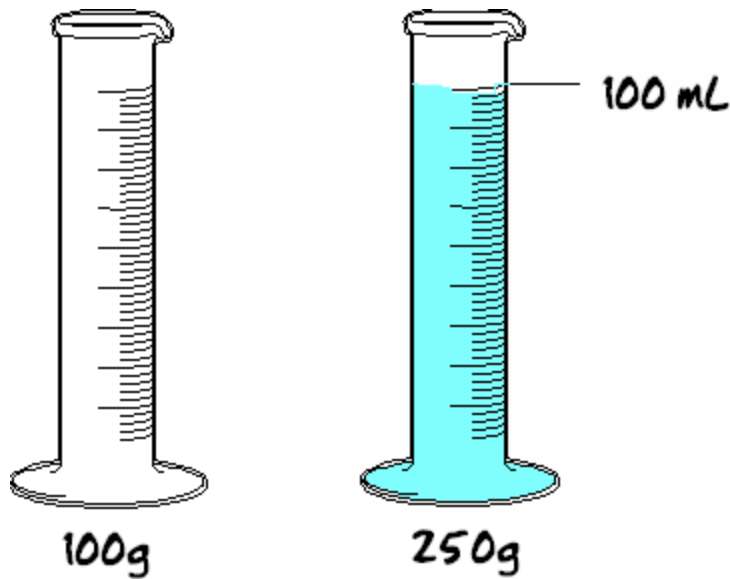
mass of liquid
250g – 100g = 150g

density of liquid
density = mass/volume
= 150g /100mL = 1.5 g/mL

Density of water:

Water is most dense at ____4____ °C.

This is because water ____expands____ above and below this temperature

4°C
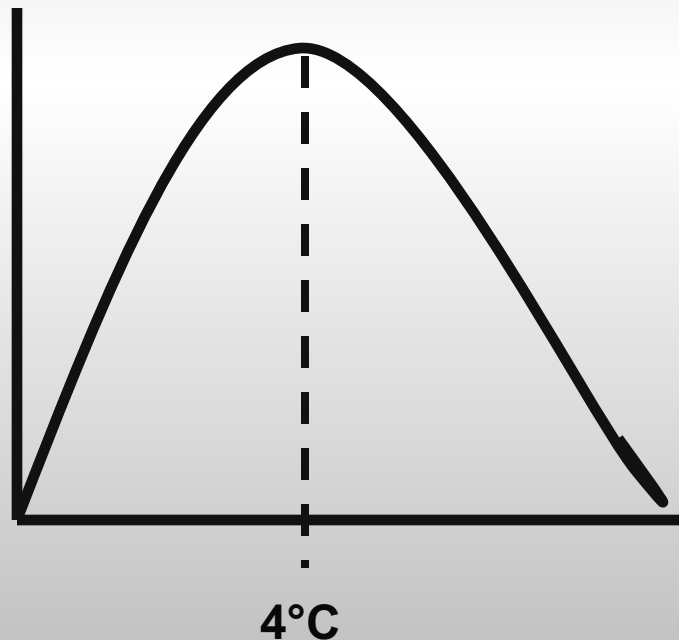
The density of water when it is most dense is:

1.00 g/mL

Density of water:

Float or Sink

Any material with a density greater than water will

FLOAT

Density of water example:

If an object has a mass of 25g and a volume of 50mL, will it sink or float in liquid water?

$$D = m \div v = 25g \div 50mL$$

$$= 0.5 \ g/mL$$

it will FLOAT

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

most dense?   least dense?

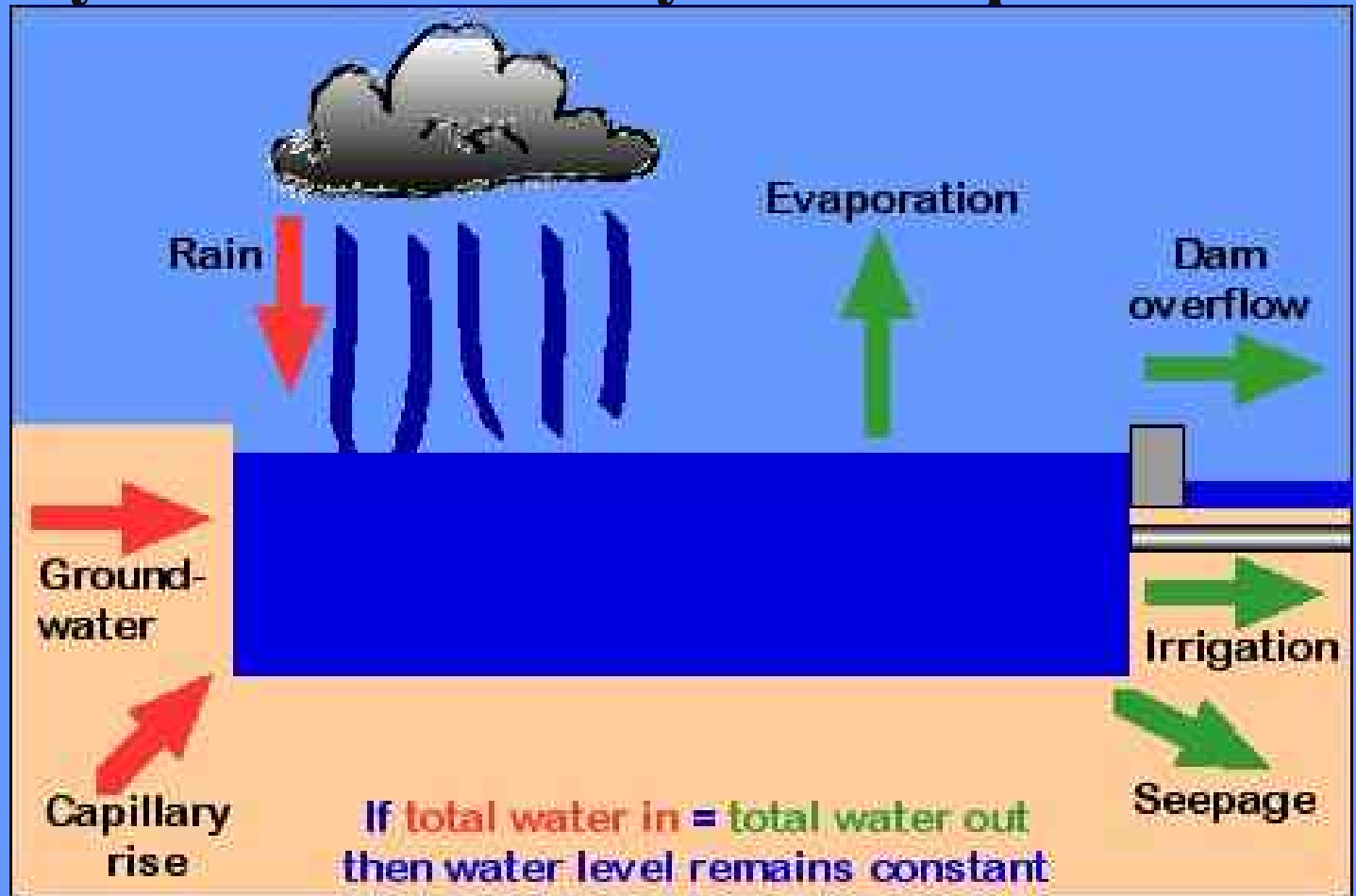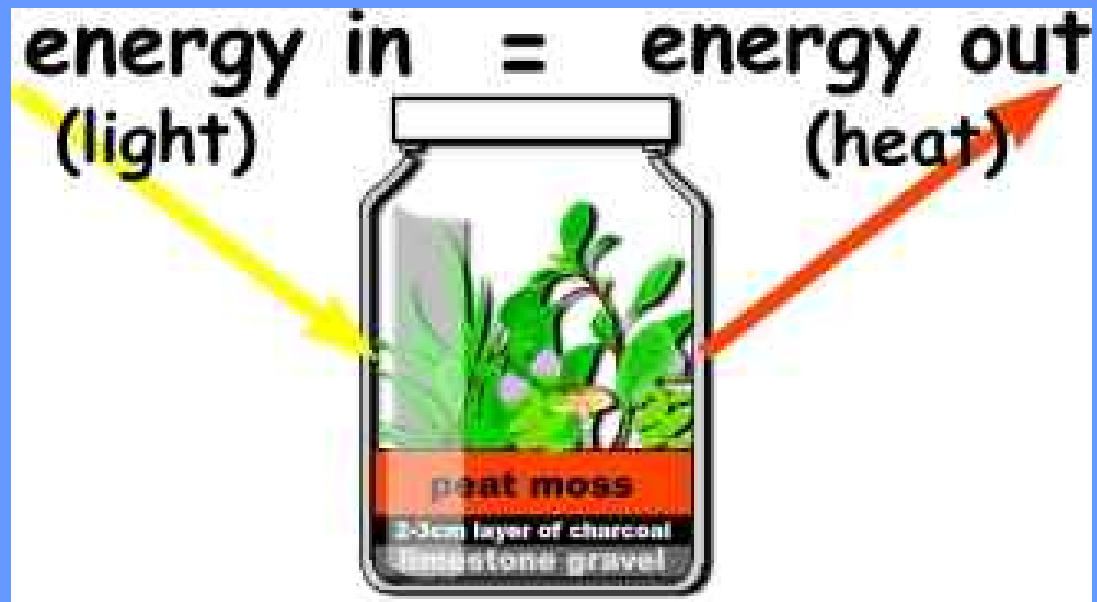**solid**   **gas**

Dynamic Equilibrium

Give a real life, earth science example of a system that is in dynamic equilibrium.
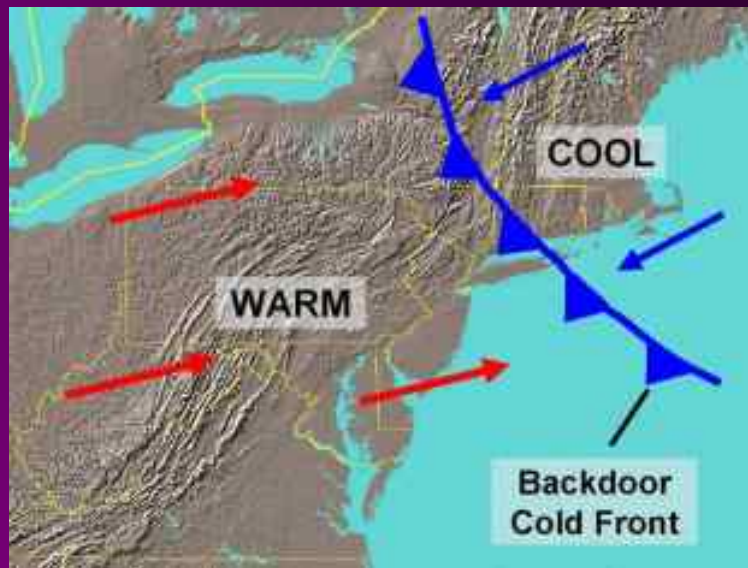
Dynamic Equilibrium

Give a real life, earth science example of a system that is in dynamic equilibrium.

Interfaces

Give a real-life,
earth science example
of an interface.

fronts

Cyclic events

Give three real-life,
earth science, examples
of cyclic events

phases of moon

yearly temperatures

sunspots

tides

sunrise & sunset