

Physical vs. Chemical



PROPERTIES AND CHANGES



Physical Properties

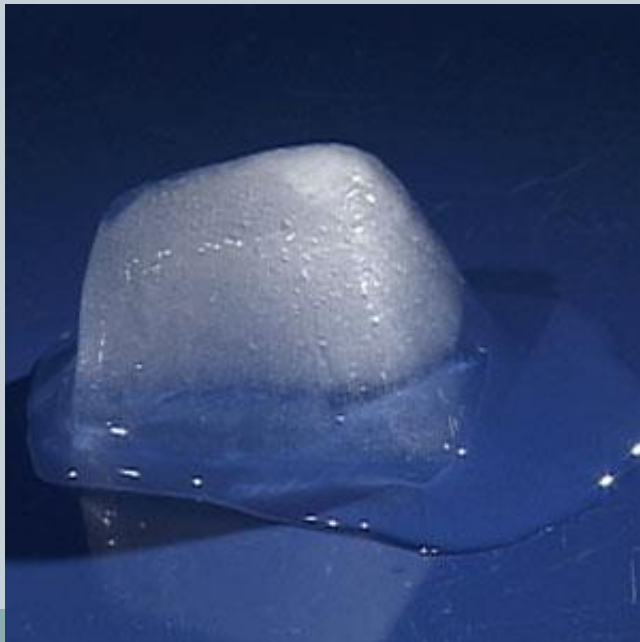


- Any observation that can be made **WITHOUT** changing the composition of the matter.
- **Examples:**
 - Color
 - Texture
 - Density
 - Odor
 - Solubility
 - Electrical & Thermal conductivity
 - Ductility (ability to roll into long strands)
 - Malleability (ability to be bent or change shape)
 - Brittleness (ability to break)
 - Melting point, boiling point, or **ANY PHASE CHANGE**

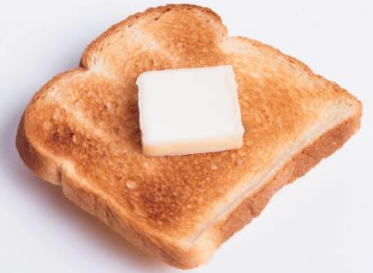
Physical Changes



- A change in size, shape, or state of matter is called a physical change. The identity of the element or compound does not change.
- DO NOT make or break bonds



Examples of Physical Changes



ANY Change in State (Boil/Freeze/Melt/Evaporate)

- Rubbing alcohol evaporates in your hand
- A juice box freezes in freezer
- Butter melts on toast

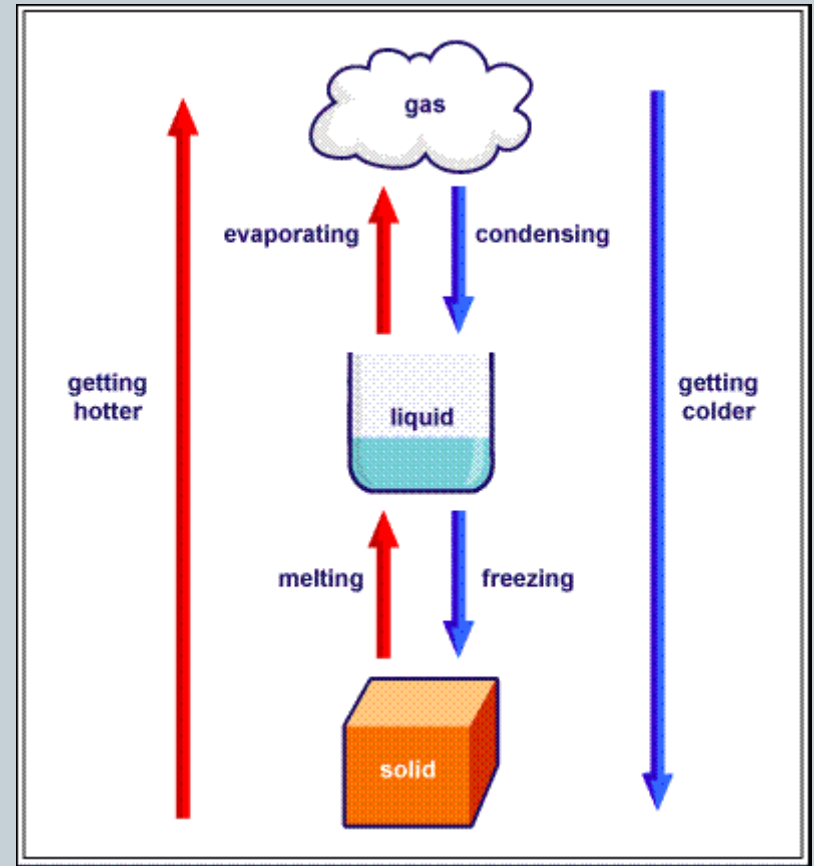
ANY CHANGE IN SHAPE OR SIZE

- Aluminum Foil cut in half
- Clay molded into new shape
- Chewing your food



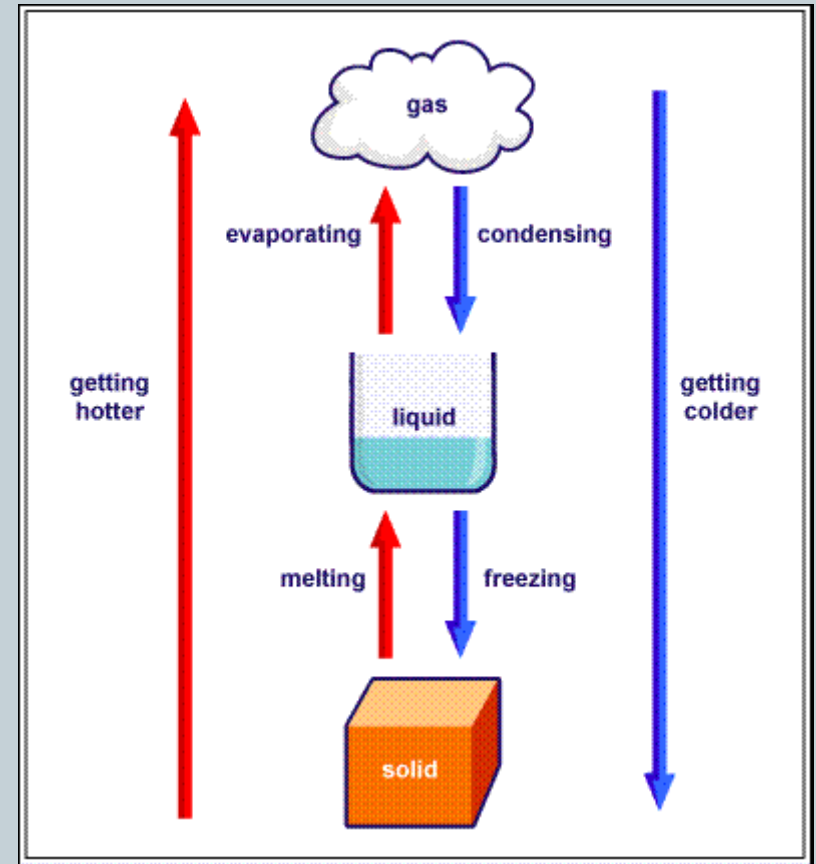
Signs of a Physical Change

- Any phase change.
- Change in energy of the particles.
- What you started off with is what you end up with chemically.



Signs of a Physical Change

- Any phase change.
- Change in energy of the particles.
- What you started off with is what you end up with chemically.



Chemical Properties



- An observation that is dependant upon changing the chemical composition of an object.
- *OR: Characteristics that are shown as one chemical is transformed into another substance*
- **Ex:**
 - Flammability
 - Ability to oxidize
 - Ability to react with acid
 - Ability to react with water

Chemical Changes



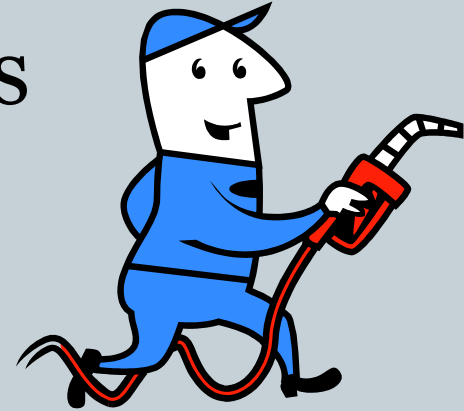
- The substances present at the beginning of the reaction are changed into something new.
 - You break bonds or make bonds!!
 - The change cannot be undone.



Examples



- Gasoline is ignited/burns
- Car rusting
- Milk goes sour
- Bread becomes toast
- Hydrogen Peroxide bubbles in a cut
- Food digesting in your stomach and small intestine (with the help of enzymes)



Signs of Chemical Change



- Bubbles of Gas appear
- Burning something
- A precipitate forms
— (solid appears)
- A color Change
- The temperature changes as a result
- There is a different smell



Quick Quiz...



- Doing sword things...
 - Physical or Chemical?



Quick Quiz...



- Sponge getting put into water...
 - Physical or Chemical?



Quick Quiz...



- **Burning Steel Wool...**
 - Physical or Chemical?



Quick Quiz...

- Rubidium dropped into water...
 - Physical or Chemical?



Quick Quiz...

- Smashing a flower that has been dipped into liquid nitrogen.
 - Physical or Chemical?



Quick Quiz...

- A carboy filled with flammable gas...
 - Physical or Chemical?



DEMOS!!!



- Mentos + Coke?
 - Chemical Change!
- Alka-Seltzer breaks?
 - Physical Change!
- Alka-Seltzer + Water?
 - Chemical Change!
- Vinegar + Baking Soda?
 - Chemical Change!
- Hot water in Can + Cold water bath?
 - Physical Change!
- Methane + Fire?
 - Chemical Change!