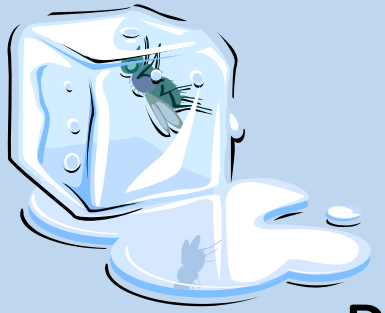
Changes in Matter



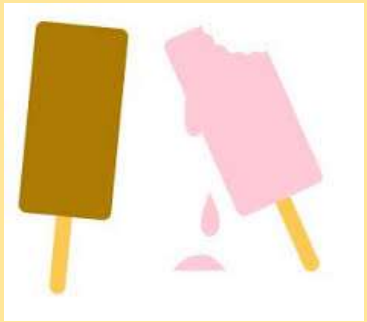
Chapter 1, sections 3 and 4

PHYSICAL CHANGES VS CHEMICAL CHANGES

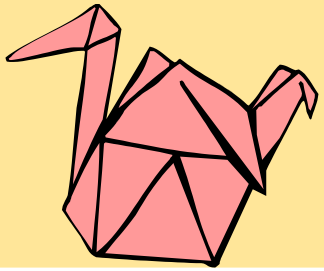
PHYSICAL CHANGES

-Any change that ***alters the form or appearance, but does not change it into a new substance.***

Ex. Changes of state (phase changes)- boiling liquids, freezing, melting



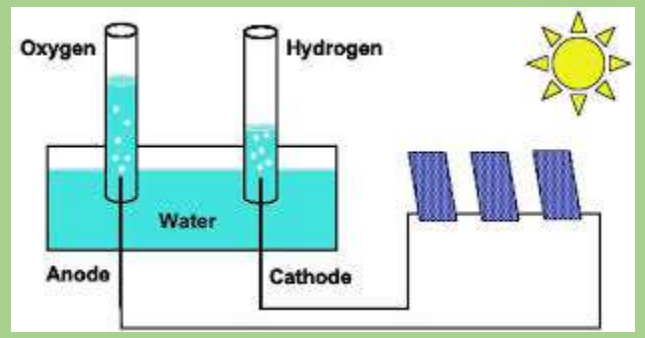
Changes of form or shape-cutting, dissolving, bending, chopping and Folding.

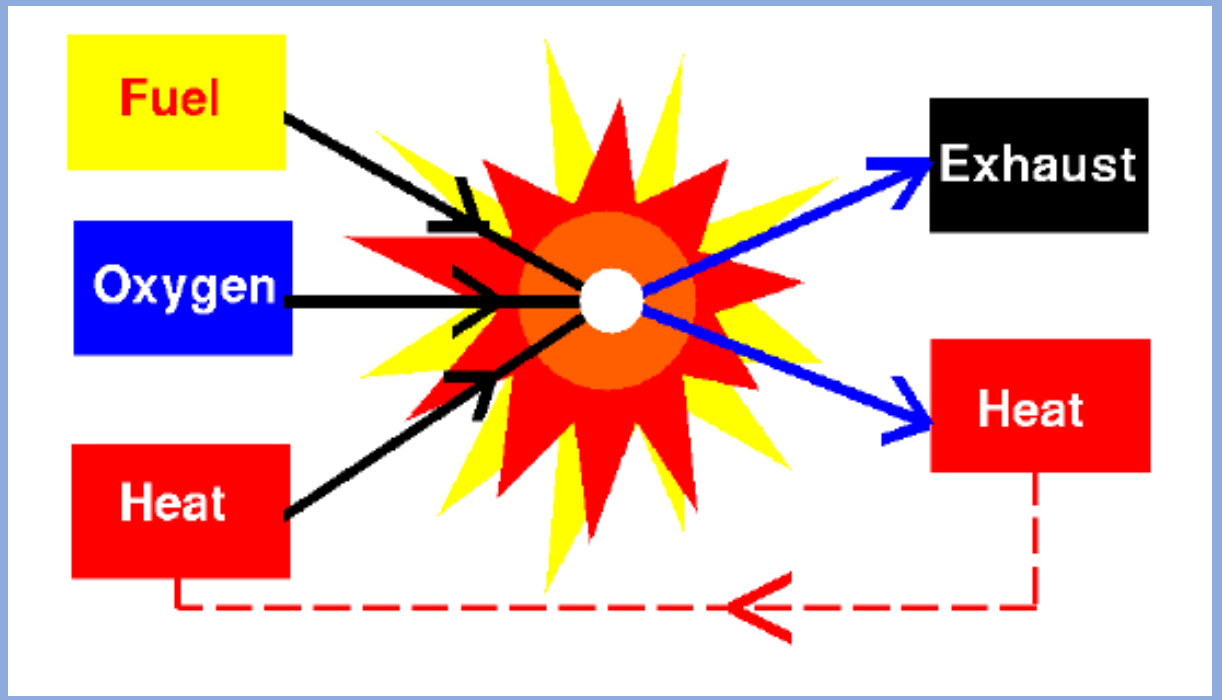


CHEMICAL CHANGES

- In a chemical change produces substances with properties different from those of the original.

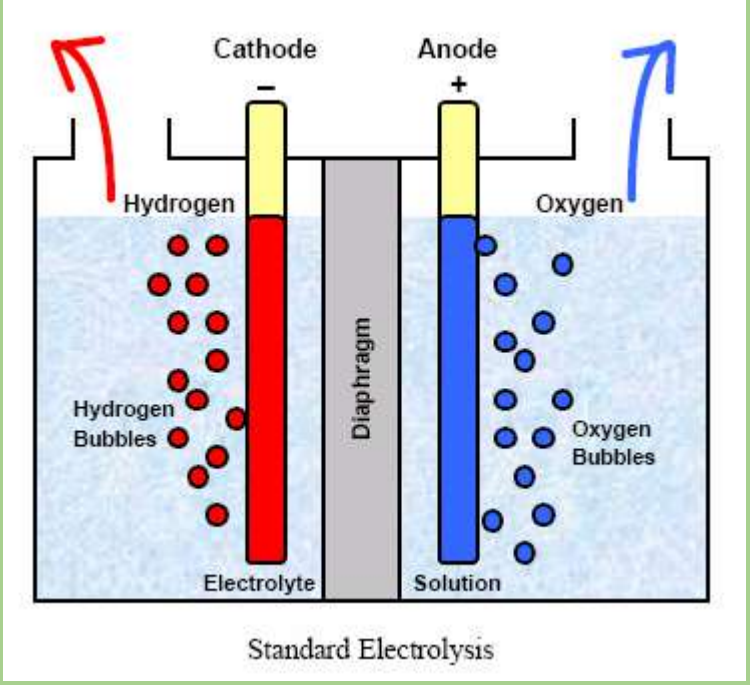
Ex. Combustion, electrolysis, oxidation, tarnishing.





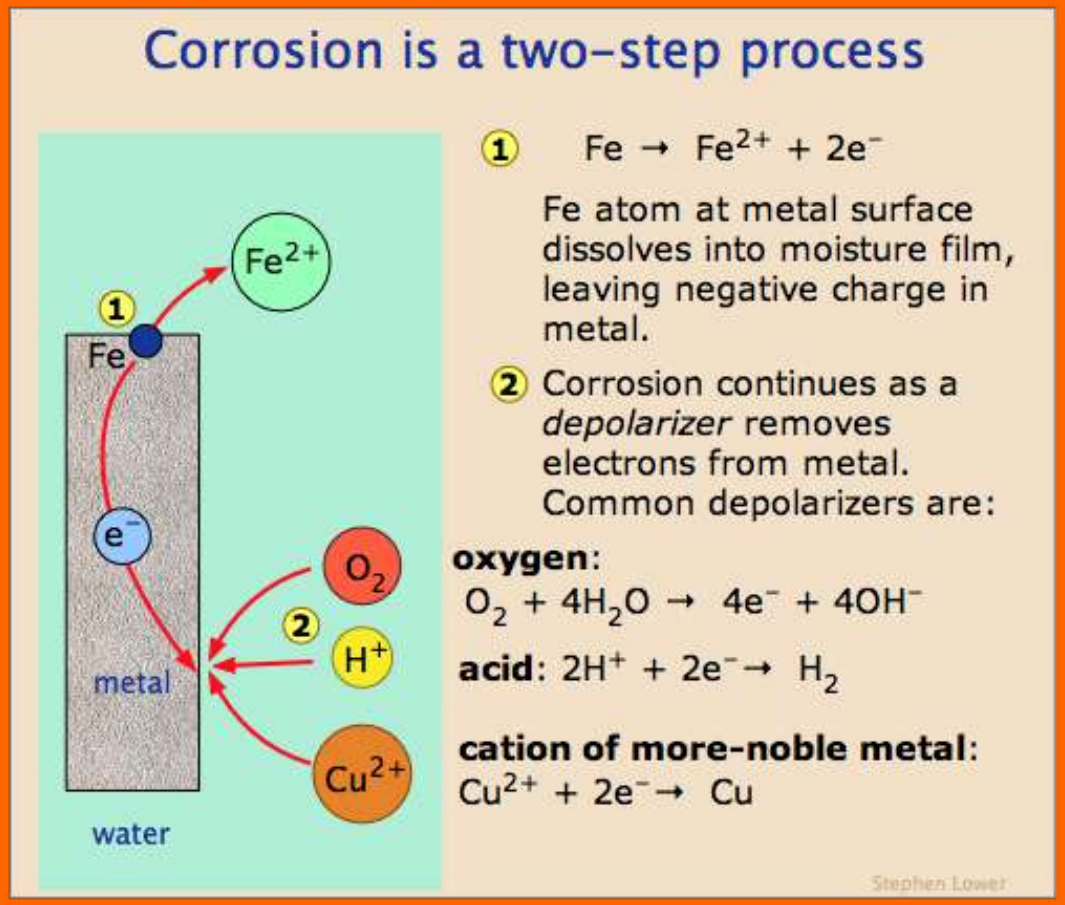
Combustion-rapid combination of fuel with oxygen.

Electrolysis-use of electricity to break a compound into elements or simpler compounds.



Standard Electrolysis

Oxidation-Slow combination of a substance with oxygen.

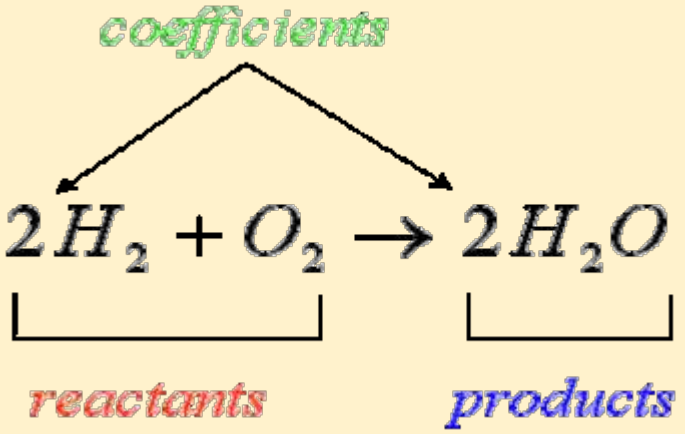


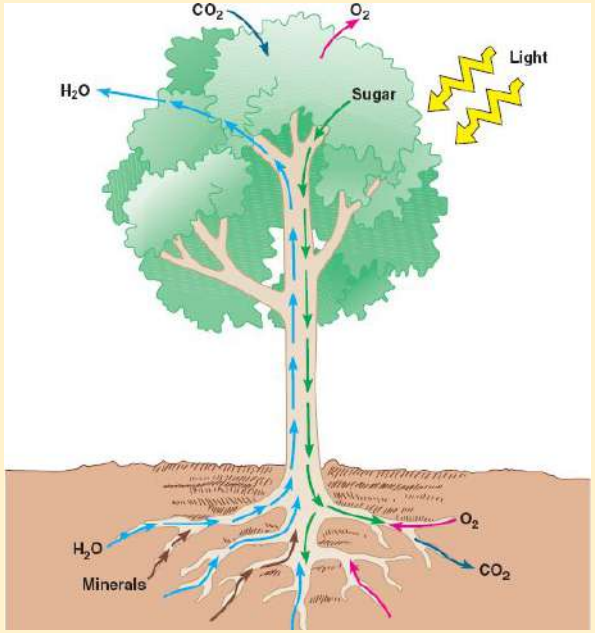
Tarnishing

Tarnishing-Slow combination of a bright metal with sulfur or another substance, producing a dark coating.

LAW OF CONSERVATION OF MASS

Matter is not created or destroyed during a chemical or physical change.
The mass is the same before and after a chemical or physical change.





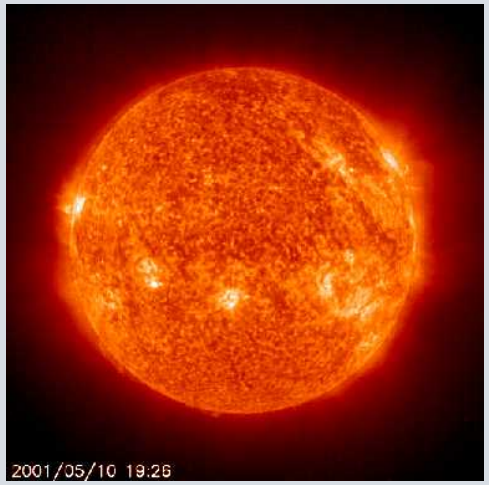
$6CO_2$ Carbon dioxide + $6H_2O$ Water $\xrightarrow{\text{Light}}$ $C_6H_{12}O_6$ Sugar + $6O_2$ Oxygen

MATTER AND THERMAL ENERGY

Energy is the ability to do work or cause change.
Every physical or chemical change in matter includes a change in energy.
Temperature is a measure of the average energy of the random motion of particles of that matter.
Thermal energy is the measure of the total energy of all the particles in an object.

Endothermic changes absorb energy during the change.

Exothermic changes release energy during the change.



Energy and Matter

Forms of energy related to changes in matter may include Kinetic, potential, chemical, electromagnetic, electrical, and thermal.

Transforming energy is when energy is changed from one form to another.

During a chemical change, chemical energy may be changed to other forms. Other forms of energy may also be changed to chemical energy.

Kinetic energy is the energy of moving objects.

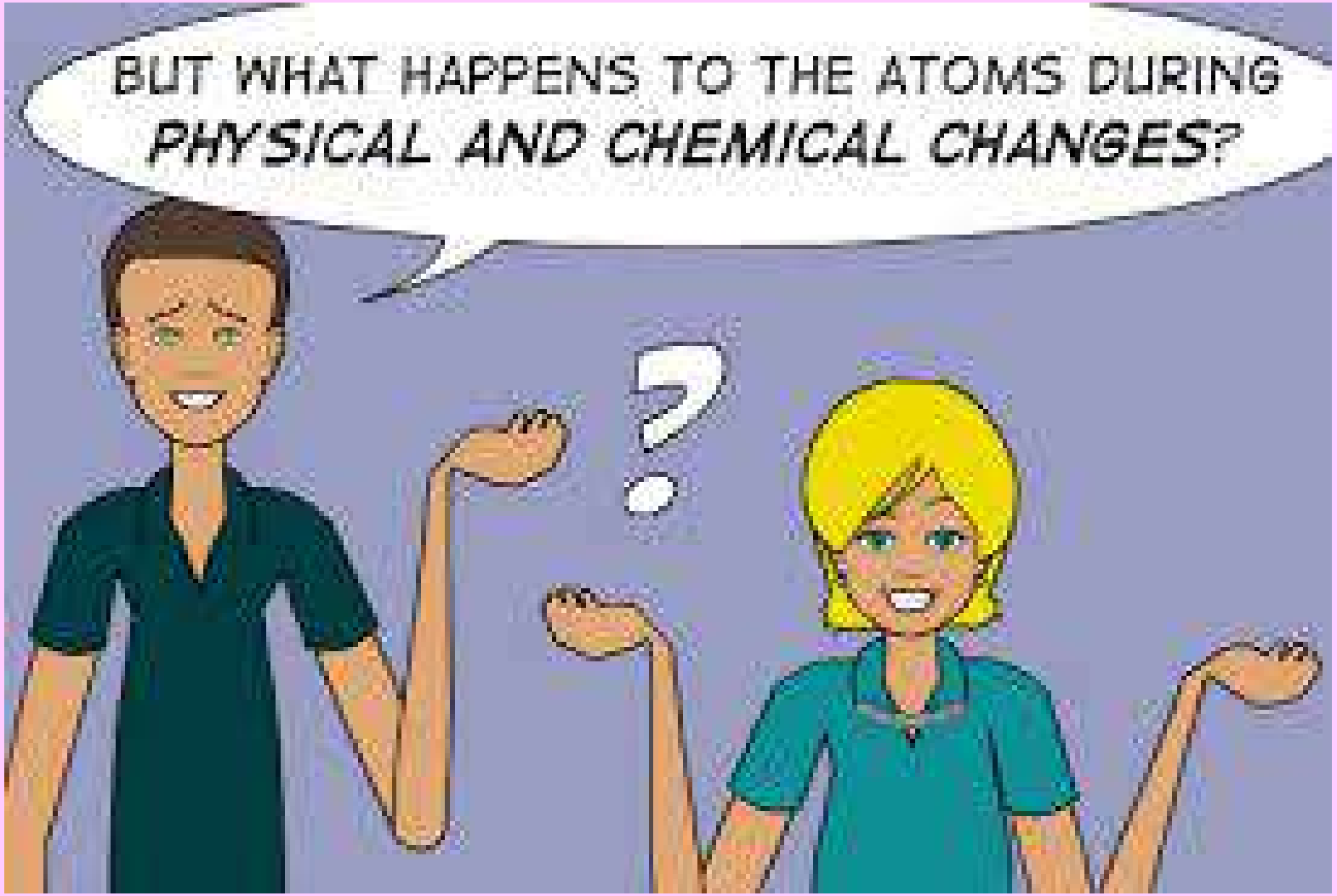
Potential energy is stored energy due to position or shape.

Chemical energy is energy stored in the bonds between atoms.

Electromagnetic energy is a form of energy that travels through space as waves.

Electrical energy is the energy of electrically charged particles moving from one place to another.

Thermal energy is related to heat.


BUT WHAT HAPPENS TO THE ATOMS DURING
PHYSICAL AND CHEMICAL CHANGES?
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