NOTES FOR THE ORGANIC LIFEOFE

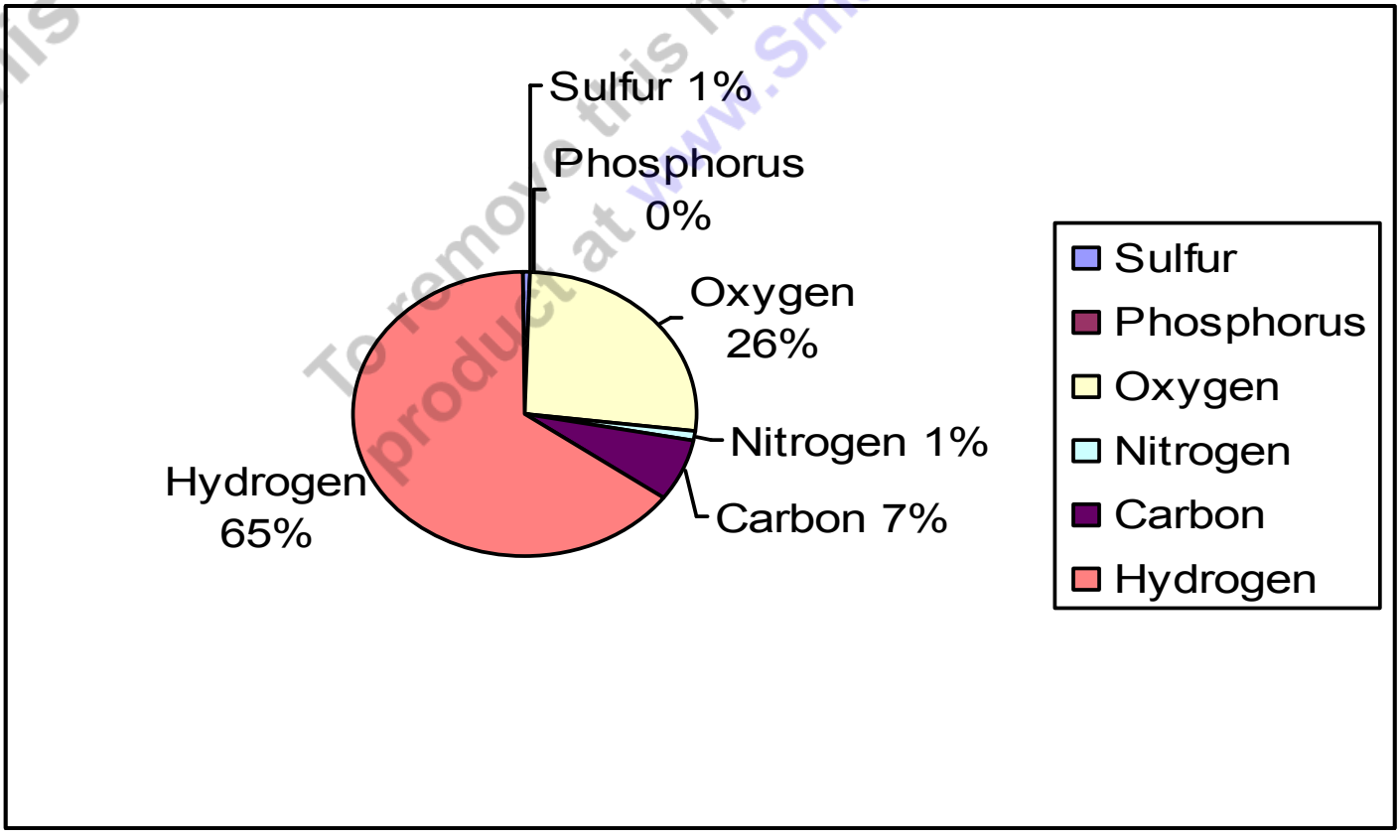
Name:_____

(DO NOT LOSE!)

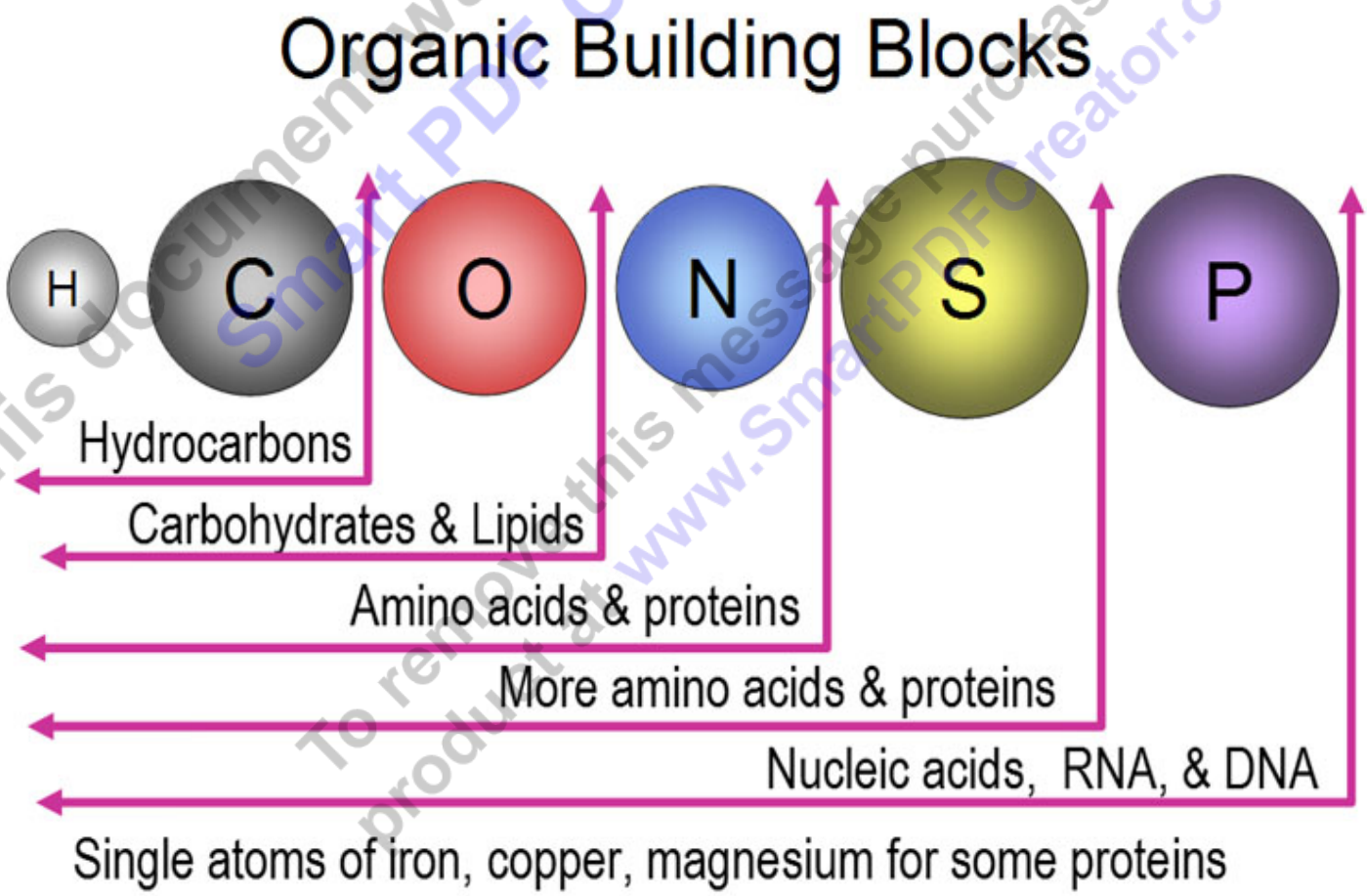
- SPONCH

- 25 of the elements are essential for life.
- SPONCH elements are the most biologically important.

- **Percentage of SPONCH elements in living things.**
-
- **S.** Sulfur - .06%
- **P.** Phosphorus - .24%
- **O.** Oxygen - 26.0%
- **N.** Nitrogen - 1.25%
- **C.** Carbon - 7.0%
- **H.** Hydrogen - 65.0%



- Record SPONCH CaFe.
- The next most important elements for life.
  - Ca= Calcium
  - Fe= Iron

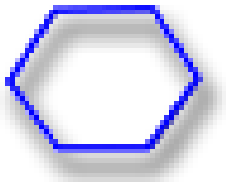


Carbohydrates (sugars) SP<u>O</u>N<u>CH</u>

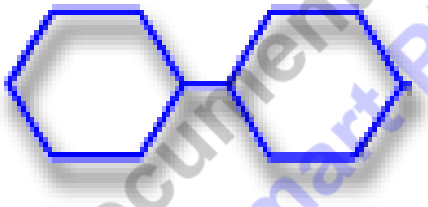
- Sugars combine to become more complex
  - -Cellulose – Cell Walls in plants
  - -Chitin – Insect exoskeleton

- -Starch is a complex sugar (longer lasting energy)

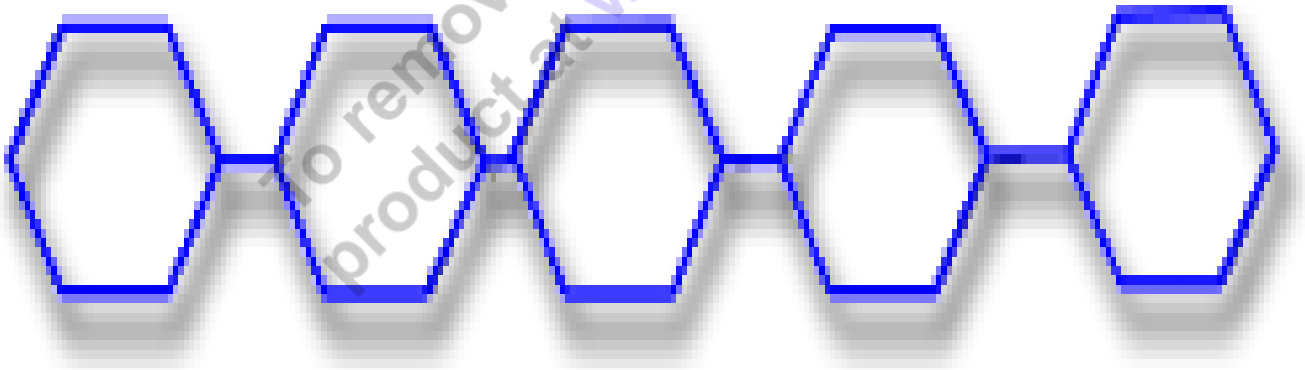
- Monosaccharide – one sugar
  - Glucose



- Disaccharides – two sugars



- saccharides – Many
  - Starch, Glycogen and Cellulose



- Polymer
  - Long complex chains of molecules

- Protein – S O N C H (Amino acid)

- Grr…
- Growth
- repair
- reproduction

- Proteins play important role in Grr…
- The important roles of a living cell

- There are also structural proteins.
  - Make list next to stick figure
- Hair is a protein
- Enzymes - Proteins act as enzymes, which are important in making chemical reactions happen in cells.
- Fingernails
- Skin
- Muscles
- Cartilage
- Ligaments and tendons

- Eyes / cornea
- Antibodies – Protect from disease

- Lipid – C H O (Fatty acid)
- Chlorophyll, which is important in photosynthesis, is a lipid.
- (AKA-Fats) They store energy.
- Cell membranes are made of a type of structural lipid.
- Body fat is a good thing, It provides your body with extra energy.
- 
- Sex hormones, such as testosterone and estrogen are made of lipids.

- Saturated Fats ☹
- Unsaturated fat ☺ (just a bit however)
- Trans Fats ☹☹☹

- Nucleic Acids – S P O N C H (Nucleotide)
- Nucleic acids include DNA, which carries genetic information, and RNA, which translates that information into proteins.

Nutrition Facts

Serving Size ½ cup (114g)
Servings Per Container 4

Amount Per Serving	
Calories 90	Calories from Fat 30
	% Daily Value*
Total Fat 3g	5%
Saturated Fat 0g	0%
Cholesterol 0mg	0%
Sodium 300mg	13%
Total Carbohydrate 13g	4%
Dietary Fiber 3g	12%
Sugars 3g	
Protein 3g	

Vitamin A	80%	•	Vitamin C	60%
Calcium	34%	•	Iron	4%

- Dangers of obesity
  - -increased risk of heart disease
  - -high blood pressure
  - -Type 2 diabetes

- -breathing problems
- -Increased risk of stroke
- -Cancers

Why Fast Food Sells

- It's Cheap
- It's Fast
- It Tastes Good (Saturated Fats)
- It's Readily Available
- It's Readily Available
- Consistency - I know what I'm getting.
- Comes with cheap plastic toys
- It's a safe place to be.
- Heavy media advertising.

Anorexia is an eating disorder where people starve themselves.

- Dangers of being to thin
  - Bones weaken
  - Irregular heartbeat.
  - Stunting of growth (permanent).
  - Loss of menstrual cycle.
    - Extreme – loss of ability to have children
  - Body has little stored energy
    - During a sickness you may need that energy.

- Bulimia nervosa – Binge eating and then purging (throwing up).
  - Erosion of tooth /Cavities.
  - Swelling and soreness in the salivary glands (from repeated vomiting).
  - Stomach ulcers

- Ruptures of the stomach and esophagus.
- Disruption in the normal bowel release function.
- Dehydration.
- Irregular heartbeat and in severe cases a heart attack.
- A greater risk for suicidal behavior.
- Decrease in libido (sex drive).

- Steroids: A naturally occurring complex ringed lipid in the body. They take part in many important body functions.

- Anabolic steroids: A group of 100+ man made hormones used to stimulate muscle and bone growth.

- Nucleic Acids – S P O N C H (Nucleotide)
  - DNA (Deoxyribose Nucleic Acid) Controls cell reproduction.

- RNA (Ribose Nucleic Acid) Makes and transfers proteins.
- Store information such as your genetic code.

New Area of Focus: What does it mean to be living?

- Organism – Any living thing

- Characteristics of living things
- Made of cells.
- Moves.
- Responds to a stimulus.
- Uses Energy.
- Adjusts to Changes.
  - Maintains steady body conditions.
  - Maintains homeostasis.
- Reproduces.
- Grows and Develops.
  - Grow-To increase in size.
  - Develop-To change in ability.
- Adapts to Change.
  - Evolves / Inherits traits that promote survival.
- Has a life span.

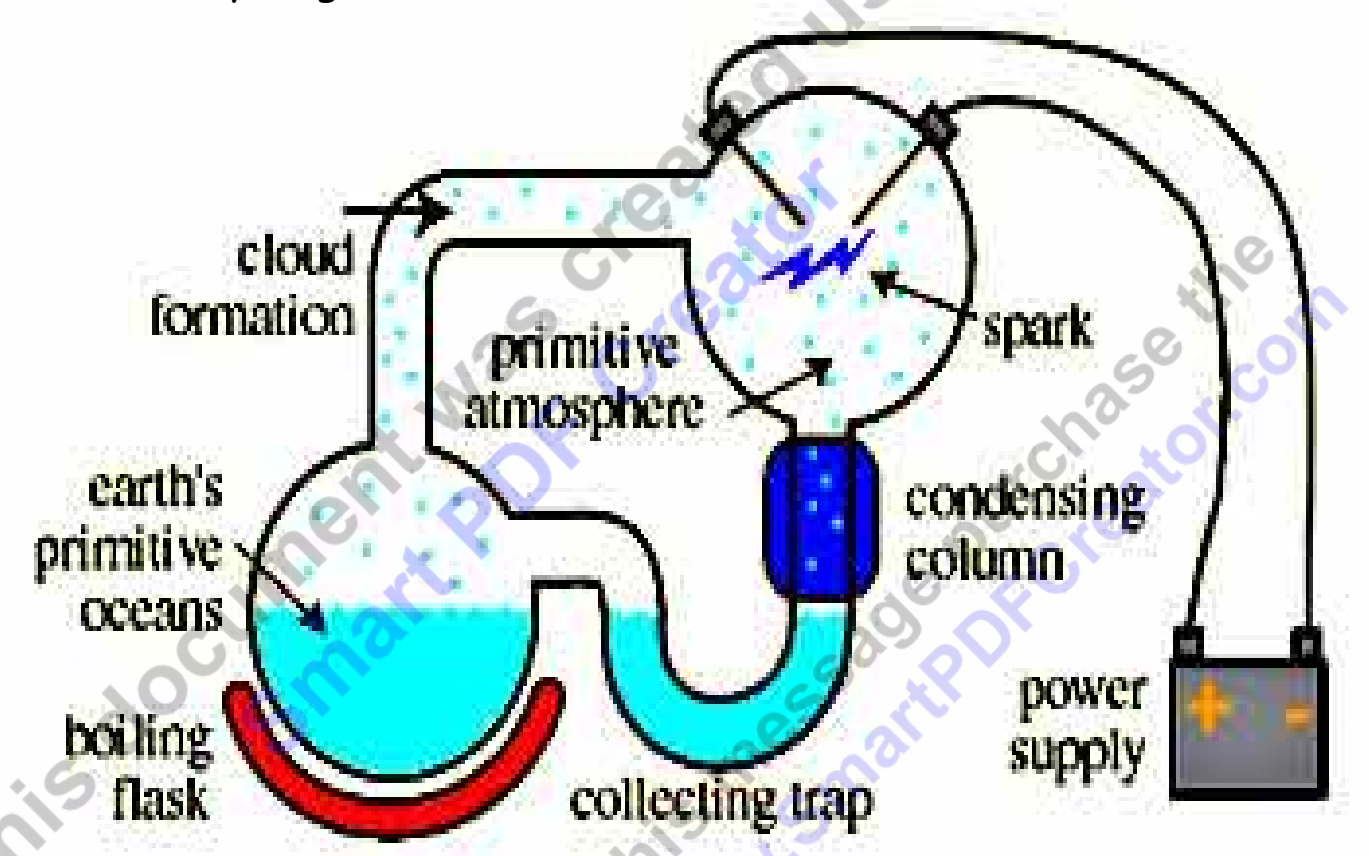
- In Science theory
  - Abiogenesis explains the origin of life.
  - Evolution explains how life changes once it exists.
  - The two are different.

- Needs of Living Things
  - Energy – Supplied by the sun (most of the time) and stored in food. TINSTAAFL!
  - Oxygen – To burn the food in cells. (Respiration)
  - Water – To keep things moving in and out of cells. (Universal Solvent)
  - Minerals- For proper chemical balance.

- The four general ideas about the origin of life.
  - Special creation – divine forces (god).
  - E.T. extraterrestrial origin – landed from space.
  - Spontaneous origin (abiogenesis) – life came from non-living materials.
  - Science viewpoint
    - Which includes
    - -Evolution (Darwinism).
    - -Cosmology (astronomy)
    - -Geology (Earth System History)
    - -Abiogenesis (Primitive life / organic chemistry).

- Origins of the Universe, a timeline.
  - Big Bang roughly 10-18 billion years ago.
  - 4.6 billion years ago: Earth was created.
  - 3.8 billion years ago: life arose.
    - Prebionts - Nonliving structures that evolved into the first living cells. (Simple)
  - 2.0 billion years ago: Eukaryotic cells (single cells with a nucleus) evolved.
  - 0.5 billion year ago: Oxygen began to saturate the atmosphere.

- Miller-Urey Experiment
  - Methane (CH4)
  - Ammonia (NH3)
  - Water (H2O)
  - Hydrogen (H2)



- The experiment used
  - Electricity (lightning)
  - Ultra-violet (UV) light (no ozone yet).
  - Heat (convection currents).
  - Cooling (condensation)
  - No oxygen (no plants).

A protein = 100 amino acids of 20 varieties
Proteins can build DNA / RNA

- Water aided in origin of life in three ways

- As a solvent – Everything dissolves in water.
  food, oxygen, minerals,
- Participant in chemical reactions such as photosynthesis.
- Medium
  - Organisms move through, waste travels away, sex cells travel through, etc.

NEW AREA OF FOCUS: HUMAN EVOLUTION.

- Hominid: any of a family (Hominidae) of erect bipedal primate mammals comprising recent humans.
- Opposable thumb – Gripping (most primates have).
- Bipedalism – Walking on two feet (regularly).

- Hominids first appeared roughly 7 million years ago (A blink in geologic time).
- Many species of hominids evolved and have become extinct (lots of fossil evidence).
- We are the only surviving hominid (Homo sapien sapien).
- Hominid dentition is very close 2:1:2:3
- Wisdom teeth – Molars leftover from when we ate mostly tough plants.

SAVE THESE NOTES FOR THE ORGANIC LIFEOFE
(DO NOT LOSE!)