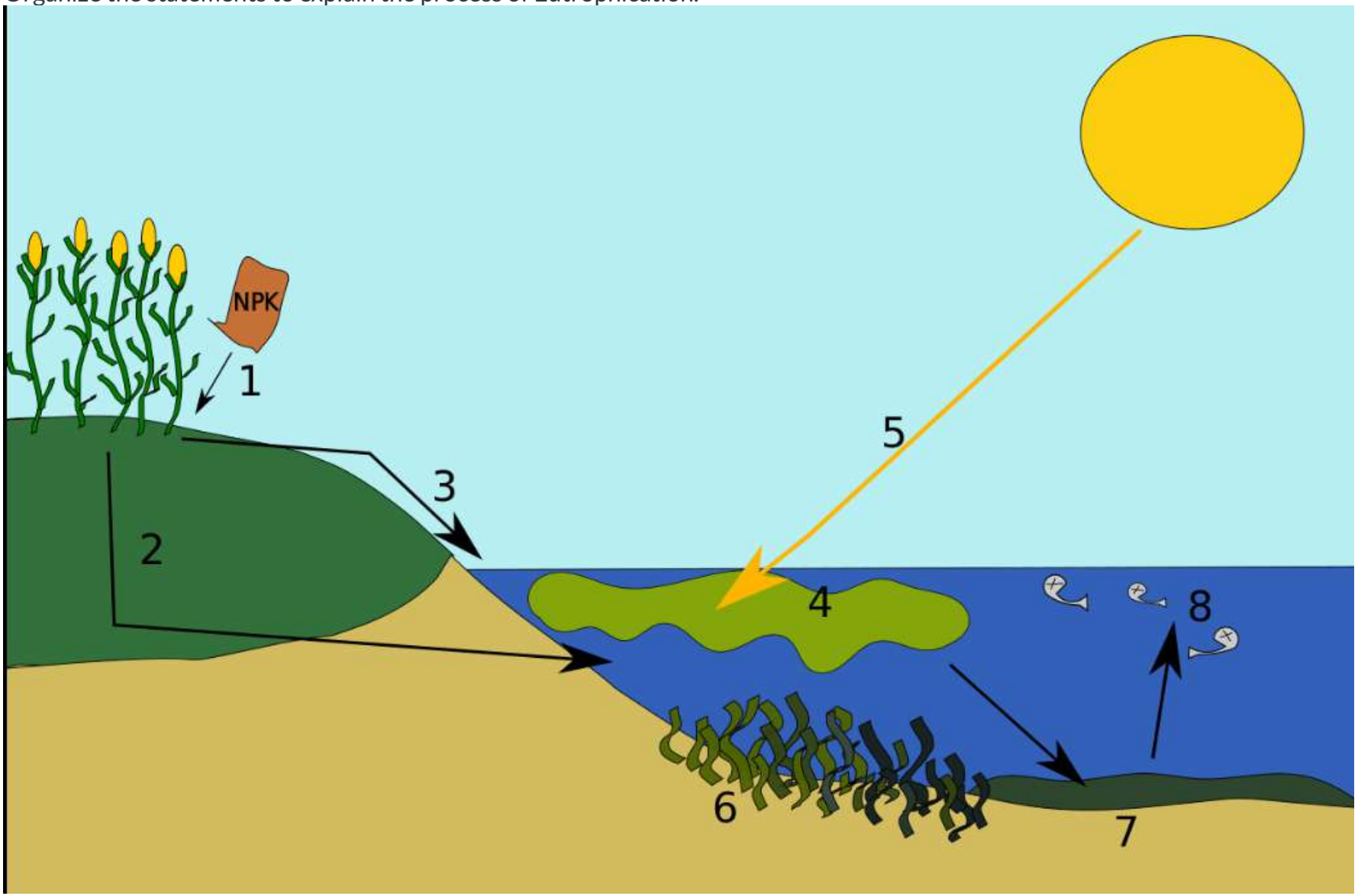
1 Ordering 2 points Eutrophication

Organize the statements to explain the process of Eutrophication.



How it begins

1	Too much nitrogen and phosphorus runs off during rain storms from farm lands and fertilized lawns.
2	Excessive Algae grows because of the added nitrogen and phosphorus. Nitrogen and phosphorus are nutrients that allow algae to grow.
3	Bacteria consume decaying algae and use up the oxygen in the water. All organisms need oxygen including algae.
4	Fish and shell fish die do to lack of oxygen.

2 Multiple Choice 1 point Eutrophication

Eutrophication is a big word that describes a big problem in the Nation's estuaries, like the Chesapeake Bay. Increase in harmful algal populations, dead zones, and fish kills are the results of a process called eutrophication. The process begins with the increased amounts of nutrients to the estuaries and coastal waters.
Which of the following is the reason for the excess nutrients in the estuaries?

- (●) excess nitrogen and phosphorus from fertilizers, over flow of wastes, and atmospherica products from fossil fuel burning.
- ( ) carbon dioxide from burning fossil fuels.
- ( ) wasts from bivalve mollusks and fish.
- ( ) nitrogen wastes from fish urine.

3 Categorization 6 points Cell respiration

What are the reactants (the stuff going in) and the products (stuff being made) in cell respiration?

Reactants (stuff going in)

6O2 C6H12O6

Products (stuff being made)

6H2O 6CO2 ATP

Possible answers

Sunlight

4 Multiple Choice 2 points photosynthesis and cell respiration?

Which of the following statements is true about photosynthesis and cell respiration?

- (●) both are using elements carbon, hydrogen and oxygen.
- ( ) both require sunlight to start the reaction.
- ( ) both produce oxygen.
- ( ) both produce ATP the energy that cells need.

5 Categorization 6 points Photosyntheisis.

What are the reactants, the stuff needed by plant to undergo photosynthesis and the products, the result of photosynthesis.

Reactants (going into plant)

6CO2 | Sunlight energy | 6H2O

Products (coming out of plant)

6O2 | C6H12O6

Possible answers

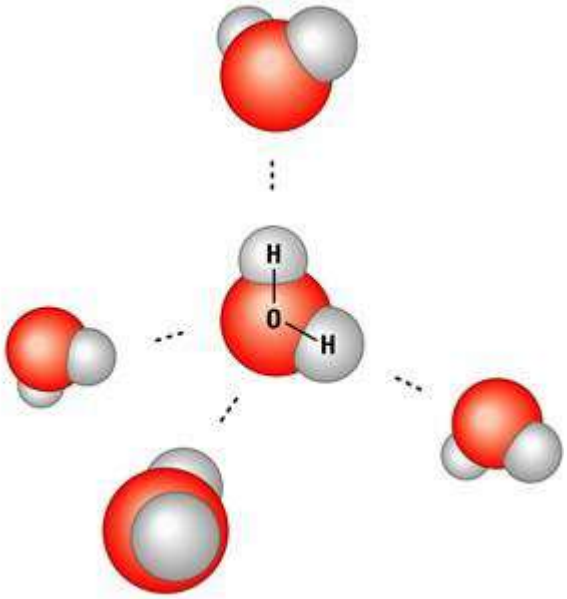
ATP

Stimulus

water molecule

Instructions
Use the information to answer the questions.

The properties of the bonds between water molecules allow them to have a number of unique characteristics. An image of the bond between molecules is shown below as dotted lines.



6 Multiple Choice 1 point water

Which of the following statements regarding the oxygen atom of water molecule is **TRUE?**

- ○ Oxygen has a partial positive charge compared to hydrogen atoms.
- ○ Oxygen does not attract electrons as strongly as the hydrogen atoms.
- ● Oxygen is more negative than the hydrogen atoms, creating a polar molecule.
- ○ Oxygen forms non-polar covalent bonds with the hydrogen atoms.

7 Multiple Choice 1 point water molecule

Which of the following properties of water is NOT related to its hydrogen bonding abilities?

- ○ Adhesive properties
- ○ Cohesive properties
- ● Neutral pH.
- ○ Low density as it becomes a solid

8 Multiple Choice 2 points water

What is the type of bonding between water molecules?

- (●) Hydrogen bonding.
- ( ) Covalent bonding
- ( ) Ionic bonding.
- ( ) Double bonding.

9 Multiple Answer 2 points wate properties

Scientists have discovered a new molecule. They want to better understand some of its bonding properties. They begin by dissolving the molecule in water. Which types of chemical bonds could this molecule have if they are easily dissolve in water? Select All that Apply.

- [x] Polar Covalent bonds
- [x] Ionic bonds
- [ ] non polar covalent bonds
- [ ] metalic bonds.

10 Multiple Choice 2 points water properties

Capillary Action is the tendency of water to travel against gravity from a plant's roots to its leaves. Capillary action goes hand in hand with cohesion and adhesion. Cohesion describes how water is able to stick to other water molecules while Adhesion describes the attraction of water molecules to other molecules. Which of the following answers choices best explains the relationship between capillary action, cohesion and adhesion?

- ○ There is no relationship between capillary action, cohesion and adhesion.
- ○ Capillary action occurs when cohesion is stronger than adhesion.
- ○ Capillary action occurs when adhesion is stronger than cohesion.
- ◉ Capillary action occurs when cohesion is equal to adhesion.

11 Multiple Answer 2 points water properties

After water enters vascular plant through its root system, transpiration is the process by which water molecules then move up the xylem tubes (vascular tissue of plants). Through transpiration, a water molecule evaporates out of the top of plant through an open stoma (an opening in the leaf) and the water column below this water molecule is pulled upwards.

Which of the following properties of water contribute to the movement of water through vasculary plants by transpiration?

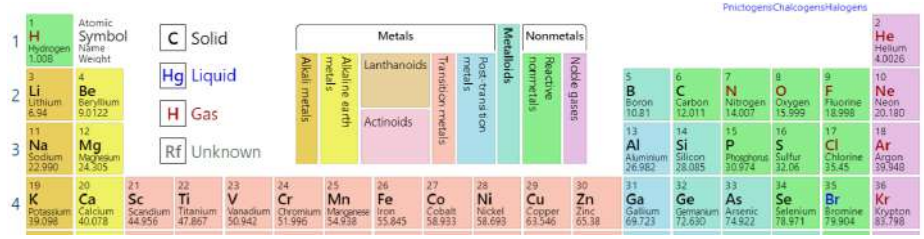
- [x] cohesion
- [x] adhesion
- [ ] Neutral pH of water.
- [ ] Low density of water as it crystallizes.

Stimulus

periodic table

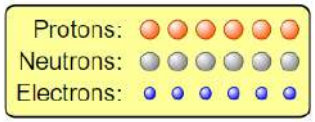
Instructions
use this periodic table to help you answer the following questions.

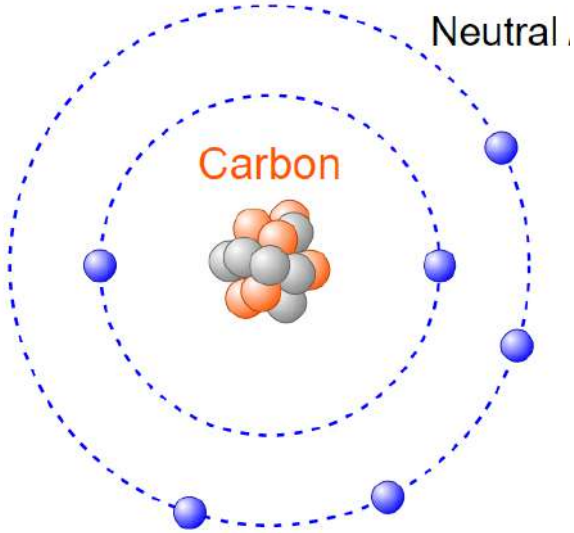
Use this periodic table to answer the following questions:



12 Multiple Answer 2 points carbon

Carbon atom is known as the major element of many of the biological molecules. Carbon can form long chains, but can also form rings, pentagons and other shapes too.





Which of the following describes the best reason why carbon can form complex biological molecules?

- [ ] Carbon atoms are polar
- [x] Carbon has 4 valence electrons and because of this can make at least four bonds.
- [ ] carbon atoms are always non-polar
- [x] Carbon atomscan form complex molecules like Glucose molecule.

13 Multiple Choice 1 point periodic table

Water (H_2O) and Sugar ($C_{12}H_{21}O_{11}$) are two very common chemical compounds. They share a number of unique chemical properties, but they also have a number of similarities. You know that sugar will dissolve in water when you make koolaid.
Which of the following properties do both water and sugar share?

- ○ both are non-polar.
- ◉ both contain covalent bonds.
- ○ both are ionic compounds.
- ○ both contain polar covalent bonds.

14 Multiple Answer 1 point periodic table

After a long-distance run, Johnny was advised to drink an electrolyte solution to maintain a healthy balance of water and ions. Electrolytes help the body maintain and regulate water balance. Some examples of electrolytes include Potassium Chloride, Calcium phosphate and calcium carbonate. **What type of compounds are electrolytes?** Select ALL that Apply

- [x] Ionic compounds, like sodium chloride, compound contains both metal (sodium) and non-metal (chloride)
- [x] Ionic compounds, like sodium chloride, because when in water, they dissolve completely in water.
- [ ] Covalent molecules because the molecule contains only non-metals
- [ ] Non polar covalent because the elements that make up electrolytes are two non metals.

15 Multiple Choice 1 point basic chemistry

The chart below gives basic information for the elements Oxygen and Sodium. The atomic masses are listed in the chart below and is an average for that element. An atom which a charge is called an ion.

Element	Symbol	Atomic number	Atomic Mass
Oxygen	O	8	15.99
Sodium	Na	11	22.99

An atom of oxygen has _____ of protons.

- [x] 8
- [ ] 11
- [ ] 16
- [ ] 22.99

Stimulus

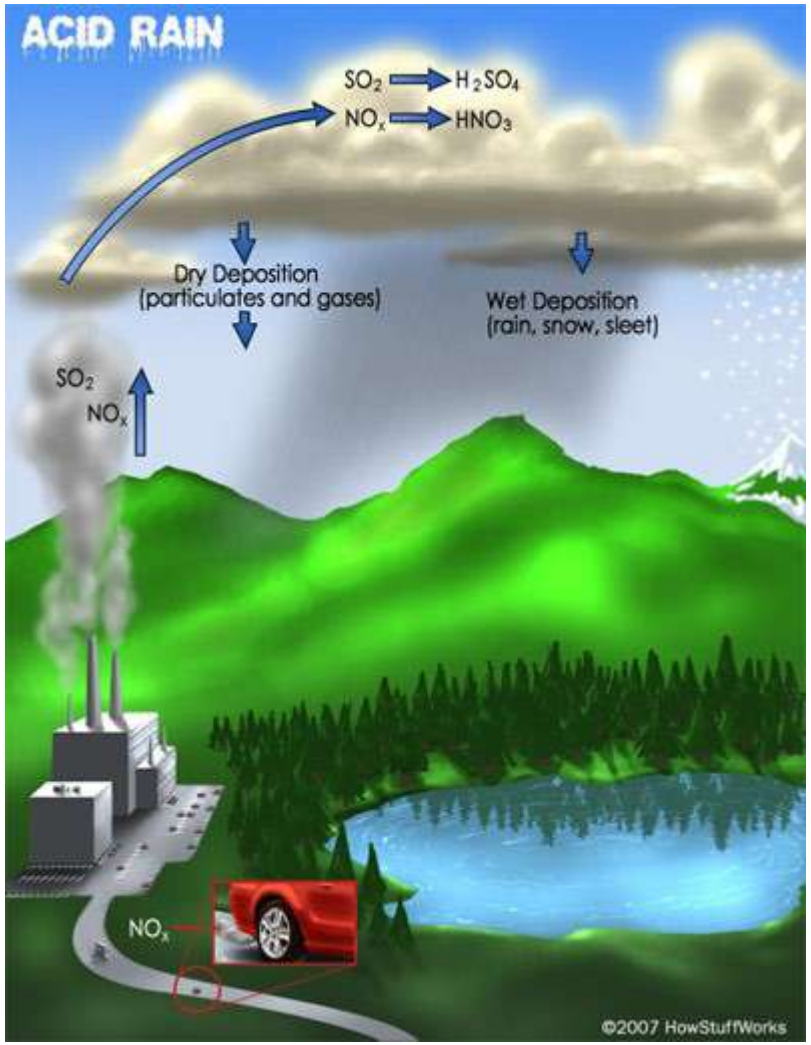
acid rain

Instructions
Use the information provide in stimulus to answer the following questions.

16 Multiple Choice 1 point periodic table

Which of the following particles inside the atom identifies the atom?

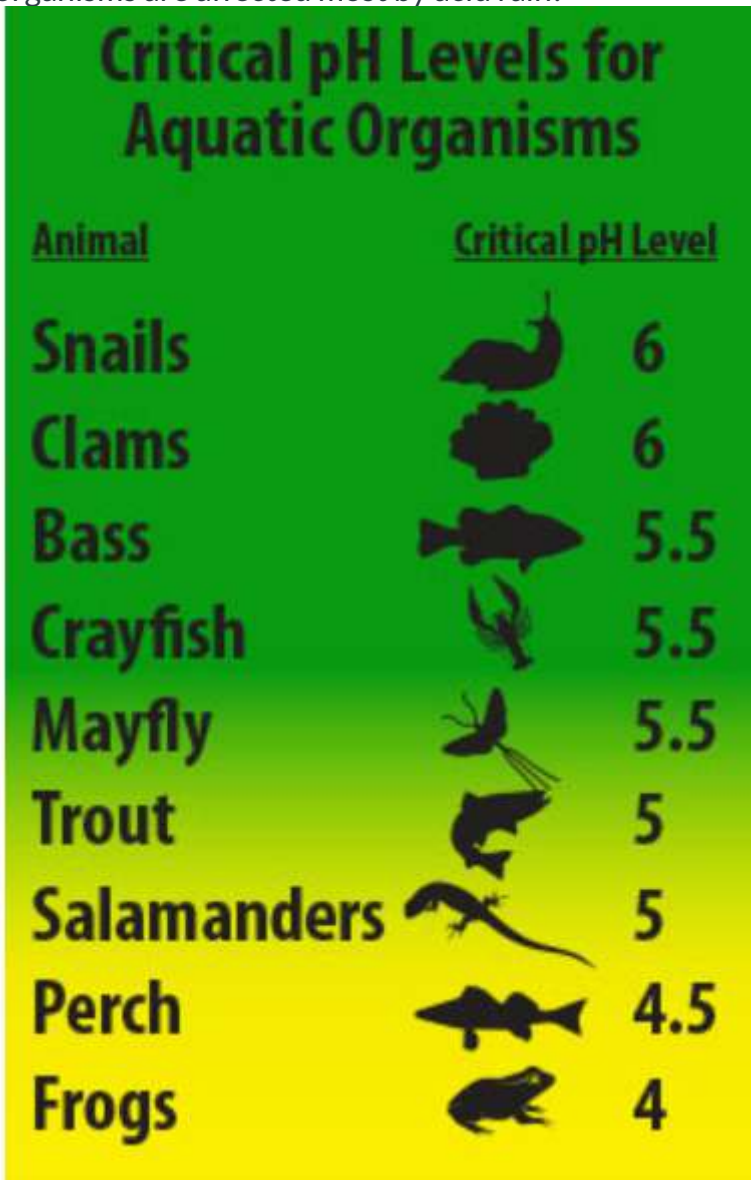
- (●) protons
- ( ) electrons
- ( ) neutrons
- ( ) all three identify what the atom is.



The picture above shows how acid rain is formed from burning of fossil fuels. The compounds SO_2 and NO_2 react with water to form H_2SO_4 and HNO_3.

17 Multiple Choice 1 point

Acid rain builds up over time in ecosystems. Certain organisms are more affected than others. Which organisms are affected most by acid rain?



- [x] Snails and clams because they begin to die at a pH of 6. This is nearly a neutral pH.
- [ ] Trout and salamanders because they are impacted at a pH of 4.5 and 5. This is nearly a neutral pH.
- [ ] Trout and mayfly, because they are impacted by a pH of 5.0 to 5.5. This is nearly a neutral pH.
- [ ] Perch and frogs because they die at a pH of 4-4.5. This is nearly a neutral pH.

18 Multiple Choice 1 point

What pH do you expect to find in the pond in the picture?

- [ ] pH around 8, therefore slightly basic
- [ ] pH around 6 as that is normal pH of pond water.
- [ ] pH around 7, therefore neutral.
- [x] pH around 4, therefore slightly acidic.

19 Essay 5 points Energy vs matter

Explain this statement: "Energy moves through the ecosystem, but matter cycles through the ecosystem. Use some examples from the picture below to help explain this.