***Acids and Bases bigtube[1]***

The degree of **acidity** or **alkalinity (basic)** is important in organisms. The body must constantly maintain a near neutral pH (7) in the blood and body tissues. To do this, the body produces **buffers** that can **neutralize** acids. Acidic and basic conditions in the body occur due to different **metabolic (chemical) reactions** taking place throughout the body.

1. What does alkalinity mean?
2. What pH must organisms maintain?
3. What characteristic of life would maintaining this balance be?
4. What chemicals does the body produce to keep neutral pH?
5. Buffers \_\_\_\_\_\_\_\_\_\_\_\_ acids in the body.
6. Acidic and basic conditions occur due to \_\_\_\_\_\_\_\_\_\_\_\_\_ reactions in the body.

Water is one of the most important molecules in the body. Cells are made mostly of water and water is required for almost every metabolic reaction in the body. The force of attraction between water molecules is so strong that the oxygen atom of one molecule can actually remove the hydrogen from other water molecules. This reaction is known as d**issociation**, and it takes place in our cells. Water (**H20) dissociates** into **H+**and**OH- ions.** A charged atom or molecule is called an **ion.** The **OH- ion is** calledthe **hydroxide ion,** while the **H+ ion** iscalled the **hydrogen ion.**  **Free H+ ions** can react with another water molecule to form the **H3O+** or **hydronium ion.** The human body requires a **neutral pH** for many reasons. One reason cells like a neutral pH is for proteins. **Basic or acidic solutions denature proteins (change their shape) so they no longer work.**

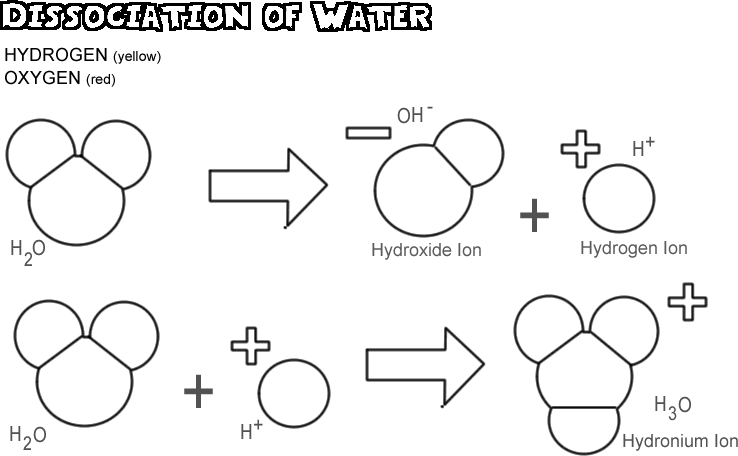
1. What is dissociation?
2. What is the chemical formula for water?
3. What is an ion?
4. Name the 2 ions form when water dissociates.
5. What is the hydroxide ion?
6. What is a hydrogen ion?
7. What is the hydronium ion and its formula?

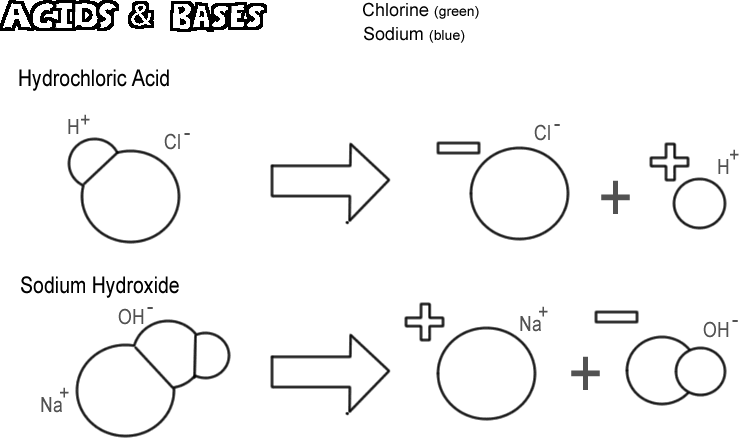
**Acidity or alkalinity** is a measure of the relative amount of **H+ and OH- ions** dissolved in a solution. **Neutral solutions** have an equal number of **H+ and OH- ions. Acids** have more **H3O+ ions (H+)** than **OH- ions. Acids** taste **sour** and can be **corrosive. Digestive fluids** in thebody are acidic and must be neutralized by buffers. **Bases** contain more **OH- ions** than **H3O+ ions. Bases** taste **bitter** and **feel slippery.**

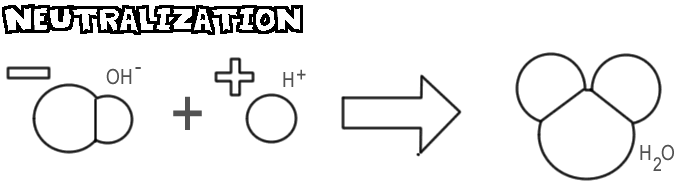
When an acid is combined with a base, **neutralization** occurs. The result of neutralization is a **salt** and **water**. Neutralization helps return our body **pH** to **neutral.** The process of our bodies maintaining neutral pH so that proteins can work properly without being denaturated (unfolded) is known as **homeostasis**.

1. How do you measure for acidity or alkalinity?
2. What is a neutral solution?
3. Acids have more \_\_\_\_\_\_\_\_\_\_\_ ions and taste \_\_\_\_\_\_\_\_\_\_\_\_\_. And can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. Bases contain more \_\_\_\_\_\_\_\_\_\_\_\_\_ ions than \_\_\_\_\_\_\_\_\_\_\_\_ ions.
5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_ fluids are acid in the body and must be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
6. Bases taste \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and feel \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
7. What is neutralization?
8. What 2 things are produced by neutralization?
9. Neutralization keeps our pH at \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and is an example of maintaining \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

***Color the following diagrams according to the key.***





***Questions:***

1. Why is the water molecule so important to organisms?

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2. What ions form when water dissociates?

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3. What is meant by the term alkalinity?

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4. What is produced by the body to help neutralize acidic conditions?

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5. What is the name for the **OH- ions**?

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6. What is the name for the **H+ ion**?

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7. How does the hydronium ion form? What is its formula?

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8. Why do most proteins need near a neutral pH?

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9. What two substances form from an acid-base neutralization?

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10. Acids have an excess of \_\_\_\_\_\_\_\_\_\_\_\_ ions.