Acids and Bases

A **scale** is a text feature that is a special kind of diagram. Like a number line, a scale gives a quick view of greater and lesser values. **Comparison text** helps you understand what is similar and different about one or more things.

Read the passage and study the scale in the diagram.

Acids and bases are compounds that people use every day. The **pH scale** is used to measure the strength of acids and bases. The scale ranges between 0 and 14.
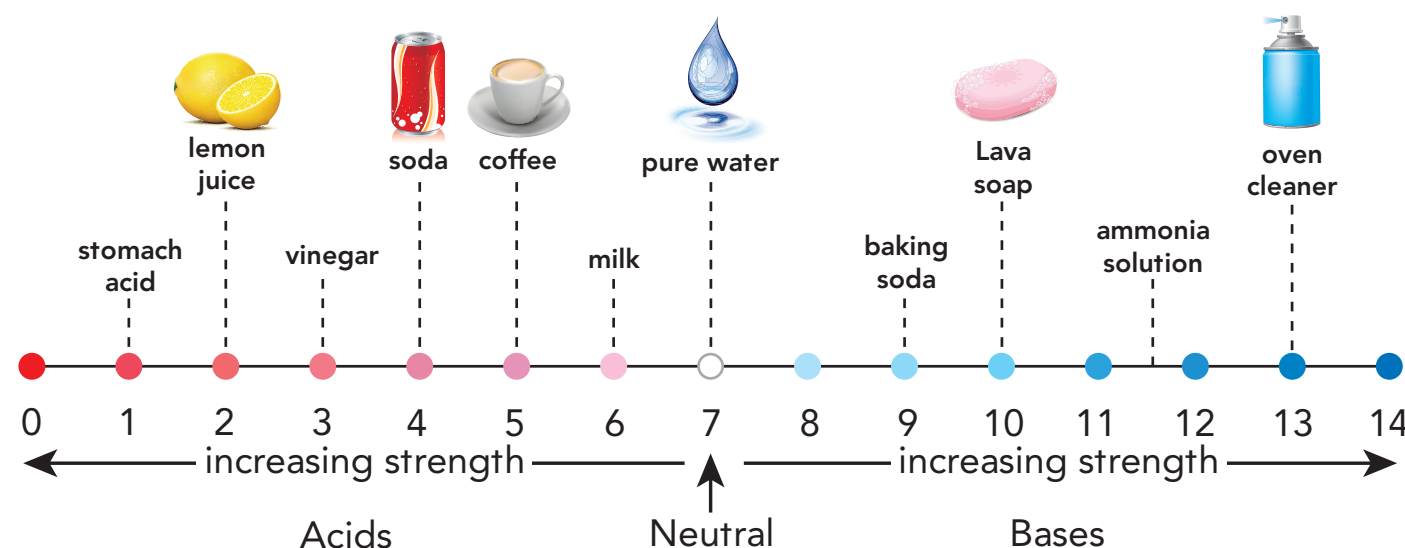
Acids are sour liquids. Some acids are harmless. The stomach makes acid to digest certain foods. Some are edible, like citric acid from oranges and lemons. Others are powerful enough to cause skin burns or "eat away" metal. Sulfuric acid (used in car batteries) and acetic acid (vinegar) are common acids.

Bases are the chemical opposite of acids. They are usually bitter and feel slippery. Some are very corrosive and reactive. Bases are used for cleaning and industrial processes. Common bases include soap, ammonia, and bleach. Milk of magnesia is a mild base people drink to cure an upset stomach.

Acids increase in strength from less than 7 to 0. Bases increase in strength from greater than 7 to 14. A substance with a pH of exactly 7 is not an acid or a base; it is a **neutral** substance.

pH Scale

lemon juice · soda · coffee · pure water · Lava soap · oven cleaner

stomach acid · vinegar · milk · baking soda · ammonia solution

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14

← increasing strength — increasing strength →

Acids · Neutral · Bases

Every one-unit change on the pH scale is a 10-fold change in the strength of the acid or base. For example, an acid with pH2 is 10 times stronger than an acid with pH3.

Use the scale and the text to complete each sentence.

1. Depending on their pH, acids can be either ■.

2. An acid you can eat is ■ acid.

3. The acid used in car batteries is called ■ acid.

4. Two characteristics of bases are ■.

5. The strength of an acid or base is measured on the ■ scale.

Use the scale and the text to answer each question.

6. What are substances that have a pH under 7 called?

7. What are substances that have a pH over 7 called?

8. Which base is 60 times stronger than water?

9. Which substance has a pH of 9?

10. Which substance has a pH of 4?

11. Which substance has a pH of 1?

12. Which is a stronger acid: lemon juice or vinegar?

A	B	C	D	E	F
lemon juice	oven cleaner	bitter and slippery	harmless or dangerous	pH	stomach acid
citric	acids	bases	soda	baking soda	sulfuric
G	H	I	J	K	L

Objective: Use text structures (comparison, description) and features (scale/diagram, caption, bold print) to locate and comprehend information presented in text and visually.