# **Acids, Bases, and Salts Comprehension Check**

1. What is an ion and how is it different from a typical atom?
2. What are acids? How do they relate to ions?
3. What happens to the hydrogen cations (H+) that are produced when an acid is dissolved in water?
4. What is a base? What is produced when a base is dissolved in water?
5. Describe the pH scale. How is it used to measure the strengths of acids and bases?
6. How can one determine the pH of a given substance?
7. Describe one way in which people use acids to make their lives easier.
8. Describe one way in which people use bases to make their lives easier.
9. What happens when acids and bases react? Why do some people consider acids and bases to be a perfect pair?
10. What properties must a substance have in order for it to be considered a salt?

# **Acids, Bases, and Salts Comprehension Check Answer Key**

1. What is an ion and how is it different from a typical atom?
   1. Ions are like special versions of atoms. Ions are atoms that have gained or lost an electron. Anions have a negative charge because they have gained an electron and cations have a positive charge because they have lost an electron.
2. What are acids? How do they relate to ions?
   1. Acids are substances that produce hydrogen cations (H+) when dissolved in water. Acids ionize in water, which means their atoms split into positively or negatively charged ions.
3. What happens to the hydrogen cations (H+) that are produced when an acid is dissolved in water?
   1. When an acid is dissolved in water, it ionizes and splits into hydrogen cations (H+). These hydrogen cations are extremely reactive because they want their electron back, so they readily form chemical bonds with atoms or molecules near them. Because bonding with water just creates more hydrogen cations, H+ instead bonds with any substance that might come in contact with the acid solution. When this happens, the hydrogen cations begin bonding in one of two ways. First, they can steal electrons from the new substance and bond with each other to form molecules of hydrogen gas. Second, they can bond directly with the new substance that was exposed to the acid solution.
4. What is a base? What is produced when a base is dissolved in water?
   1. A base is a substance that produces hydroxide anions (OH-) when dissolved in water. Hydroxide anions (OH-) are quite reactive and have an extra electron they are trying to lose. Hydroxide anions can form new bonds with substances exposed to the base.
5. Describe the pH scale. How is it used to measure the strengths of acids and bases?
   1. The pH scale is a tool chemists use to measure the strength of acids and bases. If a substance has a pH between 1 and 7, it is said to be an acid. If it has a pH between 8 and 14, it is a base, or considered alkaline.
6. How can one determine the pH of a given substance?
   1. In order to find the pH of a substance, scientists use special substances called indicators. Indicators, like litmus paper or red cabbage juice, are compounds that change color when exposed to acids or bases.
7. Describe one way in which people use acids to make their lives easier.
   1. Students’ answers about current uses for acids may vary. Responses may include information about acids in our stomachs used to break down food, to flavor food, to preserve food, as components of fertilizer to help crops grow, and in the batteries of cars and other vehicles.
8. Describe one way in which people use bases to make their lives easier.
   1. Students’ answers about current uses of bases may vary. Responses may include information about bases in industrial cleaners, weak bases in everyday soaps, bases used to make the dark and chewy crust on pretzels, and bases used as medicines for upset stomachs or as laxatives.
9. What happens when acids and bases react? Why do some people consider acids and bases to be a perfect pair?
   1. When acids and bases react, they produce salt! They are considered the perfect pair because, when combined in water, they produce a hydrogen cation (H+) and a hydroxide anion (OH-) which bond easily to form an ordinary water molecule (H2O).
10. What properties must a substance have in order for it to be considered a salt?
    1. All salts have similar properties. For example, they are brittle solids at room temperature and most dissolve in water. It is important to note that salts can come in many colors, including red, orange, yellow, green, and blue!