# **Environmental Chemistry Comprehension Check**

1. What are chemicals? What are synthetic chemicals?
2. What are chemical reactions? How are products and byproducts related to chemical reactions?
3. What are natural cycles and why are they important?
4. What is eutrophication and why should people be concerned about this process?
5. Today, what is considered to be a major disruptor of chemical cycles in nature and why is this concerning?
6. What are fossil fuels? How has burning them negatively affected the environment?
7. Why is it problematic that excess carbon dioxide is released into the atmosphere?
8. What are bioaccumulation and biomagnification?
9. What is air pollution and why is it harmful?
10. What is soil pollution and why is it harmful?

# **Environmental Chemistry Comprehension Check Answer Key**

1. What are chemicals? What are synthetic chemicals?
   1. Chemicals are any substances that make up the world’s materials. All matter is made up of chemicals! Synthetic chemicals are chemicals that have been made by humans and cannot be found in nature.
2. What are chemical reactions? How are products and byproducts related to chemical reactions?
   1. Chemical reactions occur when substances split apart or combine. Anything new is considered a product. Byproducts are the extra things produced by chemical reactions. Often, byproducts are harmful and are a concern of environmental chemists.
3. What are natural cycles and why are they important?
   1. Natural cycles are the movement of chemicals through interactions with living and nonliving things. Natural cycles transport the elements of life, like carbon and nitrogen, around our planet. Living things take these elements from the environment and use them to survive. The natural cycles in place replenish those chemicals so they can be used by other living things in the future. Natural cycles are needed to sustain life.
4. What is eutrophication and why should people be concerned about this process?
   1. Eutrophication is the process by which a body of water becomes enriched in dissolved nutrients that promote the growth of plant life, resulting in the depletion of dissolved oxygen in water. Unfortunately, eutrophication often leads to the death of many aquatic creatures because there is not enough oxygen in the water for them to survive.
5. Today, what is considered to be a major disruptor of chemical cycles in nature and why is this concerning?
   1. Today, humans are considered to be a major disruptor of chemical cycles in nature. This is concerning because humans continue to develop technological advancements that harm the environment and will soon reach a point where cycles have been disrupted beyond repair. People’s actions have permanent negative impacts on the environment.
6. What are fossil fuels? How has burning them negatively affected the environment?
   1. Fossil fuels come from the remains of living things that died millions of years ago. These living things had carbon stored in their bodies. Burning them today produces energy, but also release tens of billions of tons of carbon dioxide into the atmosphere. Because carbon dioxide is a greenhouse gas, burning fossil fuels is a major contributor to climate change and Earth’s warming temperatures.
7. Why is it problematic that excess carbon dioxide is released into the atmosphere?
   1. It is problematic that excess carbon dioxide is released into the atmosphere because it contributes to Earth’s rising temperatures. Because carbon dioxide is a greenhouse gas, it traps heat inside Earth’s atmosphere. This has led to warming climates across Earth and has contributed to our planet’s quickly worsening environmental health.
8. What are bioaccumulation and biomagnification?
   1. Bioaccumulation occurs over time as living things become increasingly contaminated by synthetic chemicals. Predators face a great danger from bioaccumulation because they tend to experience biomagnification. This is the process by which a compound, like a pollutant, increases its concentration in the tissues of organisms as it travels up the food chain.
9. What is air pollution and why is it harmful?
   1. Air pollution refers to the mixture of solids and gases in the air that are harmful to living things. Air pollution results from tiny particles suspended in the air called particulates. Natural particulates include dust, pollen, mold, and soot. Other particulates are generated by human activity, like burning fossil fuels. In addition to harming the environment, larger particulates can irritate our airways and lungs, and smaller particulates can enter the bloodstream and cause damage.
10. What is soil pollution and why is it harmful?
    1. Soil pollution refers to the pollution that can occur on land. Often, pollution from water and air settles out onto the land. Plants can absorb these pollutants and die. In addition, animals that rely on the plants for survival can also eat them and experience negative effects.