

Chemistry

An Introduction to Chemistry

Chemistry is the science that studies the **substances**¹ that make up the universe. Chemists investigate properties of substances to find out what they are made of and how they change under different conditions. Chemists heat and freeze different objects. They also add other substances to the items to see how they react. The basis of chemistry lies in the basic elements that make up everything that exists in the world. All of those elements can be viewed on the periodic table of **elements**,² which you will most likely become very familiar with throughout your academic career.

Chemical changes aren't just happening in chemists' labs. They happen all the time in nature. Think about the process of breathing. You inhale oxygen and exhale carbon dioxide. That is chemistry. When you light a fire, wood turns to ashes. A chemical change takes place. These are examples of chemistry on a very basic level. Chemists have been studying chemical changes for a very long time. Chemistry crosses over into many different fields. It's important in medicine, engineering, energy, and **industry**.³

Chemistry takes a substance and looks at the molecules that make up that substance. The molecules are then broken down to atoms. Atoms are so tiny that they cannot be seen with the naked eye. You actually need to use a very powerful **microscope**⁴ to see an atom. Chemists can bond atoms to each other to see what happens. When an atom is sliced in half, a nuclear reaction occurs. Chemists who discovered how to split an atom in a controlled environment created the atomic bombs that were dropped on Hiroshima and Nagasaki in Japan during World War II. Chemists have also discovered how to create life-saving drugs. Chemistry is a pretty powerful thing.

¹ **substances** – something that has weight and takes up space

² **elements** – one of the substances that each has its own kind of atom

³ **industry** – making or producing goods on a large scale by businesses and factories

⁴ **microscope** – an instrument with a special lens for making a smaller object appear larger

Name: _____

Date: _____

1. Chemistry is the study of
 - a. the process of breathing air in and out.
 - b. the substances that make up the universe.
 - c. how to create medicines and drugs.
 - d. how different sciences relate to each other.

2. Why does the author describe the process of breathing and lighting a fire?
 - a. to provide common examples of chemical changes
 - b. to show how many things do not require chemistry
 - c. to contrast the sciences of chemistry and physics
 - d. to explain how complicated the world of chemistry is

3. Which of the following professionals would most likely NOT use chemistry?
 - a. a lawyer
 - b. a doctor
 - c. a science teacher
 - d. an engineer

4. Read the following sentence: "Chemists investigate properties of substances to find out what they're made of and how they change under different conditions."

The word **properties** means

- a. theories or guesses
 - b. models or fake versions
 - c. the best of something
 - d. characteristics or features

5. This passage is mainly about
 - a. how chemists split an atom.
 - b. how chemical reactions are always taking place.
 - c. an introduction to the science of chemistry.
 - d. why people should become chemists.

6. What is one example from the passage of chemical changes in nature?

7. Explain why the author says that chemistry is “a pretty powerful thing.”

8. The question below is an incomplete sentence. Choose the answer that best completes the sentence.

Atoms are so tiny that they cannot be seen with the naked eye, _____
you need to use a very powerful microscope to see an atom.

- a. even though
- b. so
- c. because
- d. however

9. Read the following sentence.

In laboratories, chemists conduct experiments to learn about substances.

Answer the questions below based on the information provided in the sentence you just read. One of the questions has already been answered for you.

- 1. Who? chemists
- 2. What do chemists do? _____
- 3. Where? _____
- 4. Why? _____

10. **Vocabulary Word** : industry: making or producing goods on a large scale by businesses and factories.

Use the vocabulary word in a sentence: _____

Teacher Guide and Answers

Passage Reading Level: Lexile 790

Featured Text Structure: Descriptive - the writer explains, defines or illustrates a concept or topic

Passage Summary: The author introduces the basics behind the science of chemistry.

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 - a. the process of breathing air in and out.
 - b. the substances that make up the universe.**
 - c. how to create medicines and drugs.
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6. What is one example from the passage of chemical changes in nature?

Suggested answer: The passage lists the process of breathing and lighting a fire with wood as examples of chemical changes in nature.

7. Explain why the author says that chemistry is “a pretty powerful thing.”

Suggested answer: Answers will vary. Students can say that chemistry can produce powerful things like bombs or life-saving drugs. Students can also say that it is powerful because it makes up the whole universe.

8. The question below is an incomplete sentence. Choose the answer that best completes the sentence.

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- b. so**
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- 1. Who? chemists
- 2. What do chemists do? **conduct experiments**
- 3. Where? **in laboratories**
- 4. Why? **to learn about substances**

10. **Vocabulary Word:** industry: making or producing goods on a large scale by businesses and factories.

Use the vocabulary word in a sentence: answers may vary.