SN EDUCATOR GUIDE

January 30, 2021

Chemical Bond Acts Like a Mash-Up

Student Discussion Worksheet

Directions: Read the online *Science News* article "This weird chemical bond acts like a mash-up of hydrogen and covalent bonds," which explores a new type of chemical bond. A version of the story, "Chemical bond acts like a mash-up," can be found in the January 30, 2021 issue of *Science News*.

Classical definitions

Discuss the following questions with a partner before reading the *Science News* article. Reference an outside resource if needed, but try to determine examples on your own.

1. What does electrostatic attraction mean? How does this concept apply to atoms and chemical bonding?

2. What is the difference between intermolecular and intramolecular attraction forces? Explain and give an example of each based on your understanding of the concepts.

3. What type of attraction force is generally thought of as a "true chemical bond?" What does this tell you about the general difference in attractive strength of intermolecular versus intramolecular attraction forces?

4. Why do we attempt to classify types of chemical bonds and/or attractive forces within a substance or mixture?

Modifying definitions

Read the online *Science News* article "This weird chemical bond acts like a mash-up of hydrogen and covalent bonds," and answer the following questions individually, before discussing them with a partner.

1. What is a hydrogen-mediated chemical bond and why is it unique?

2. Given the information in the article, what chemistry terms need to be redefined? Why?

Exceptions to the rules

Discuss the following questions with a classmate. Write down your thoughts and be prepared to share your answers with the class.

1. Give an example of an exception to a generalized chemistry concept that you learned about this year and explain why the exception exists. For example, were there exceptions to trends on the periodic table, classifications of properties of certain types of substances (acids/bases, conductors/insulators, etc.), or other theories (kinetic molecular theory, etc.)?

2. Based on the new research described in the *Science News* article, write an exception to the generalized concept of chemical bonding.

3. Think about how you would prefer to learn information. Would you rather learn a set of generalized concepts then think through and explain the exceptions to those concepts? Or would you rather assume that there are no generalized concepts and evaluate each phenomenon on a case-by-case basis? Before answering, discuss the benefits and drawbacks of each option, and why you think the way that you do.