

Student Discussion Worksheet

Directions: Read the online *Science News* article "[Wildfire smoke may ramp up toxic ozone production in cities](#)" and answer the following questions with a partner. A version of the article, "Wildfires may boost urban ozone levels," appears in the January 15, 2022 issue of *Science News*.

Gaseous solutions

1. What is air? Define its phase of matter and explain what it is composed of. Is it an element or a mixture of elements and/or molecules? Would you describe it as homogeneous or heterogeneous?

2. What is smoke? Define its phase of matter and explain what it is composed of. Is it an element or a mixture of elements and/or molecules? Would you describe it to be homogeneous or heterogeneous?

3. Wildfire smoke is created from a chemical reaction. What are the typical reactants and products of the reaction?

4. What properties of gases can be quantifiably measured? List as many as you can think of and give examples of the units of measurement associated with each.

Quantities and reactions

1. What aspects of wildfire smoke did the scientists mentioned in the article study? What were the scientists trying to determine?

2. According to the article, what is one gaseous chemical found in wildfire smoke that is harmful to humans when inhaled? How do scientists think the chemical is formed in wildfire smoke? Write a general chemical reaction without using chemical formulas.

3. Using the chemical reaction that you created in your answer to the previous question, explain why there may be higher levels of ozone in wildfire smoke over city centers.

Smoky implications

1. This article offers one example why measuring and understanding the gaseous chemistry of an environment is important. Explain why.
2. Why is studying wildfire smoke so difficult in the real world?
3. Why would it be difficult to create a science word problem like ones found in chemistry textbooks for the creation of ozone in wildfire smoke? Why would it be difficult to check the problem's validity with real measurements?

