# Ozone Connections

Trace how conditions, actions, and outcomes connect in an air-quality text.

**CCSS.ELA-Literacy.RST.9-10.5** "Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction force, energy )."

NAME _____ DATE _____

## 1 READ AND MARK

Read it twice

**YOUR JOB** Underline key terms that name a condition, substance, action, or outcome. Draw arrows between at least six underlined terms and label each arrow with the relationship stated in the passage.

### Why an Ozone Alert Matters

1 On a hot afternoon, a city may issue an air-quality alert because ground-level ozone has risen. Ozone in the upper atmosphere helps block some ultraviolet radiation, but ozone near the ground can irritate lungs. This ground-level ozone does not come straight from a tailpipe. Instead, sunlight drives reactions between nitrogen oxides and volatile organic compounds, gases released by vehicles, factories, and some paints. Heat can speed the reactions. As temperature and sunlight increase, ozone levels may climb, especially when air remains trapped over the city. The alert connects weather conditions, chemical ingredients, and a health risk.

2 One way to reduce ozone is to lower the gases that form it. For example, a transit agency can add buses and offer free fares on alert days. If more people ride instead of drive, fewer vehicle emissions enter the air. This action targets nitrogen oxides and volatile organic compounds, not ozone already present. A different response is a health advisory. Schools may move sports practice indoors when ozone is high. The advisory does not reduce the chemical reaction, but it can reduce people's exposure while the reaction continues. Thus, emission cuts address a cause, whereas indoor practices address an effect on people.

3 City officials also use forecasts to organize these responses. A forecast combines expected sunlight, temperature, wind, and emissions. Wind matters because it can carry polluted air away or bring it into a neighborhood. When forecasters predict conditions that favor ozone formation, officials can announce an alert before concentrations peak. The alert is not a prediction that every person will become ill. Rather, it gives people, especially those with asthma, time to limit strenuous outdoor activity. In this system, a forecast leads to an alert, and the alert leads to choices that can lower exposure. Those choices differ from emission reductions, which aim to prevent some ozone from forming.

## 2 ANSWER WITH EVIDENCE

Use the passage

1. How does paragraph 1 distinguish ozone in the upper atmosphere from ground-level ozone? Explain the relationship between each location and ozone's effect.

2. What cause-and-effect relationship links sunlight, heat, nitrogen oxides, volatile organic compounds, and ground-level ozone?

3. How are emission cuts and indoor sports practices alike, and how do they differ in the problem each response addresses?

4. What sequence of relationships does paragraph 3 give from a forecast to a person's health-related choice?

## 3 YOUR TURN

Your own words

Using only information from the passage, create a concept chain with at least six terms and five labeled arrows. Include a contrast showing how emission cuts and indoor practices respond differently to ozone.

ANSWER KEY

# Ozone Connections

HIGH SCHOOL · RST.9-10.5

## PART 1 · READ AND MARK

Underline key terms that name a condition, substance, action, or outcome. Draw arrows between at least six underlined terms and label each arrow with the relationship stated in the passage. Accept any marking that follows this job and points at the right text.

## PART 2 · ANSWERS

| # | QUESTION | ANSWER |
|---|---|---|
| 1 | How does paragraph 1 distinguish ozone in the upper atmosphere from ground-level ozone? Explain the relationship between each location and ozone's effect. | **Upper-atmosphere ozone helps block some ultraviolet radiation, while ground-level ozone can irritate lungs.** |
| 2 | What cause-and-effect relationship links sunlight, heat, nitrogen oxides, volatile organic compounds, and ground-level ozone? | **Sunlight drives reactions between nitrogen oxides and volatile organic compounds, and heat can speed those reactions, helping ozone levels climb.** |
| 3 | How are emission cuts and indoor sports practices alike, and how do they differ in the problem each response addresses? | **Both respond to high ozone conditions. Emission cuts target gases that form ozone and address a cause, while indoor practices reduce people's exposure and address an effect.** |
| 4 | What sequence of relationships does paragraph 3 give from a forecast to a person's health-related choice? | **A forecast predicts conditions favoring ozone formation, which can lead officials to announce an alert. The alert gives people time to choose actions, such as limiting strenuous outdoor activity, that can lower exposure.** |

## PART 3 · YOUR TURN (SAMPLE ANSWER)

Sunlight → drives → reactions between nitrogen oxides and volatile organic compounds; heat → speeds → those reactions; these gases → form → ground-level ozone; ground-level ozone → can irritate → lungs. Forecast → leads to → alert → leads to → choices that lower exposure. In contrast, emission cuts target the gases that form ozone, while indoor practices lower exposure without reducing the reaction.

Accept arrows and labels that accurately show causal, sequential, or contrast relationships stated in the passage. The concept chain must use passage information, include at least six terms and five relationships, and distinguish prevention of ozone formation from reduction of exposure.