

Critical Thinking

ANALOGIES

In the space provided, write the letter of the pair of terms or phrases that best completes the analogy shown. An analogy is a relationship between two pairs of words or phrases written as **a : b :: c : d**. The symbol **:** is read "is to," and the symbol **::** is read "as."

- _____ 1. carbon dioxide : plants ::
a. CFCs : ozone layer c. methane : livestock
b. oxygen : humans d. water vapor : global warming
- _____ 2. El Niño : warm phase ::
a. weather : drought c. poles : latitude
b. wind : solar energy d. La Niña : cold phase
- _____ 3. oblique sunlight : poles ::
a. summer sunlight : winter sunlight
b. day : night
c. weather : climate
d. vertical sunlight : equator
- _____ 4. chlorofluorocarbon : chlorine ::
a. ozone : oxygen c. reaction : atom
b. carbon dioxide : nitrogen d. ozone hole : stratosphere
- _____ 5. UV light : phytoplankton ::
a. water : plants
b. air : animals
c. chlorine atoms : ozone molecules
d. greenhouse effect : water vapor
- _____ 6. model : equations ::
a. warming : cooling c. radiation : atmosphere
b. computer : calculations d. language : alphabet
- _____ 7. polar ice mass : sea level ::
a. coastal wetlands : floods
b. clouds : weather
c. ocean surface temperature : storms
d. Gulf Stream : currents
- _____ 8. beaches : erosion ::
a. agriculture : droughts c. model : warming
b. atmosphere : rivers d. water : cooling

Critical Thinking *continued*

INTERPRETING OBSERVATIONS

Read the following passage and answer the questions that follow.

Ignoring the effects of air resistance, careful measurements of a falling object will show the object picks up more and more speed with each passing second. This is easy to prove by rolling a ball downhill. Friction notwithstanding, the ball will roll faster and faster the further it rolls. Many scientists have used this analogy when describing global warming in Arctic areas. The more these areas warm, the faster they continue to warm. Worldwide, over the past hundred years, scientists have measured the average temperature rise to be approximately 1°F. However, since 1970, measurements from some parts of Alaska indicate a 5°F rise. Though warmer temperatures bring increased snowfall, the same conditions each year are also melting the snow faster than it can accumulate. As Alaskan glaciers melt and expose more bare earth, the glaciers appear to be retreating northward. In many northern areas, as permafrost and ice beneath the surface melts, lands sink and roots of trees drown. Entire forests are disappearing from too much water and from damage brought about by increased insect populations.

- 9.** Compare polar regions (with glaciers and snow-and-ice cover) to temperate regions. Which region is likely to experience a sharper temperature rise? Explain your answer.

- 10.** Do you agree with scientists' predictions about the warming of Alaska and other polar regions? Justify your response.

Critical Thinking *continued*

AGREE OR DISAGREE

Agree or disagree with the following statements, and support your answer.

11. Industrialized countries should assist countries with tropical rain forests so that those governments can afford to leave their forests intact.

12. The correlation between carbon dioxide levels in the atmosphere and world temperatures for the past 160,000 years proves that higher carbon dioxide levels cause global warming.

13. Developing countries should not participate in treaties that set allowable levels of greenhouse emissions in developed countries.

Critical Thinking *continued*

REFINING CONCEPTS

The statements below challenge you to refine your understanding of concepts covered in the chapter. Think carefully, and answer the questions that follow.

14. Some scientists predict that global warming will cause major ocean currents to shut down. The Gulf Stream moves warm water from equatorial areas toward northern latitudes. How might an ocean current shutdown affect the climate?

15. A catalyst speeds up a process but is not changed itself. CFCs are known to release catalysts that break down the ozone layer. How does this process work?

16. The carbon in fossil fuels was in the atmosphere long ago. Why does burning these fuels and releasing the carbon back into the atmosphere create a problem today?
