Skills Worksheet

Concept Review

MATCHING

In the space provided, write the letter of the term or phrase that best matches the description.

_____ **1.** ground-level ozone

_____ **2.** scrubber

_____ **3.** radon gas

_____ **4.** nitrogen oxides

_____ **5.** decreased pH

_____ **6.** possible long-term effect of air pollution

_____ **7.** necessary to control acid precipitation

_____ **8.** atmospheric condition trapping pollution

_____ **9.** possible short-term effect of air pollution

_____ **10.** possible long-term effect of noise pollution

a. primary pollutant

b. secondary pollutant

c. indoor air pollution

d. pollution control

e. acid precipitation

f. temperature inversion

g. lung cancer

h. deafness

i. international agreement

j. nausea

MULTIPLE CHOICE

In the space provided, write the letter of the term or phrase that best completes each statement or best answers each question.

_____ **11.** Which of the following is an example of a primary pollutant?
   a. ground-level ozone
   b. soot from smoke
   c. radon
   d. All of the above

_____ **12.** Which of the following would be a potential cause of sick-building syndrome?
   a. acid precipitation
   b. smog
   c. fungi
   d. all of the above

Concept Review *continued*

_____**13.** Catalytic converters, scrubbers, and electrostatic precipitators are examples of
    a. technologies used to treat sick-building syndrome.
    b. technologies used to counteract the effects of acid precipitation on aquatic ecosystems.
    c. technologies used to capture radon gas.
    d. technologies used to control pollution emissions.

_____**14.** During a temperature inversion,
    a. sulfur oxides and nitrogen oxides combine with water in the atmosphere.
    b. an influx of acidic water causes a rapid change in the pH of water.
    c. levels of ground-level ozone decrease.
    d. pollutants are trapped near Earth's surface.

_____**15.** What is *not* a consequence of acid precipitation?
    a. an increase in the pH of soil and water
    b. the death of aquatic plants and animals
    c. the destruction of calcium carbonate in building materials
    d. a change in the balance of soil chemistry

_____**16.** High blood pressure and stress are both human health effects linked to
    a. smog.
    b. air pollution.
    c. light pollution.
    d. noise pollution.

_____**17.** Oil refineries and gasoline stations are both sources of
    a. particulate matter.
    b. volatile organic compounds.
    c. smog.
    d. All of the above

_____**18.** Uranium-bearing rocks underneath a house can be a source of
    a. ozone.
    b. asbestos.
    c. radon.
    d. formaldehyde.

_____**19.** An increase in the pH of a lake would most likely indicate
    a. the lake suffers from acid shock.
    b. calcium carbonate has been released into the lake.
    c. the area in which the lake is located suffers from acid precipitation.
    d. higher than average sulfur oxide levels in the atmosphere.

_____**20.** Acid precipitation is formed when
    a. sulfur oxides or nitrogen oxides combine with water.
    b. sulfur oxides combine with nitrogen oxides.
    c. ozone combines with automobile exhaust.
    d. nitric or sulfuric acids combine with ozone.

Name _____ Class _____ Date _____

Critical Thinking

ANALOGIES

In the space provided, write the letter of the pair of terms or phrases that best complete the analogy. 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.** scrubber : smokestack ::
   a. ZEV : smog
   b. catalytic converter : tailpipe
   c. VOCs : gasoline pumps
   d. car seats : vinyl chloride

_____ **2.** particulate matter : primary pollutant ::
   a. asbestos : radon
   b. ground-level ozone : secondary pollutant
   c. sulfur dioxide : fossil fuels
   d. VOC : smog

_____ **3.** temperature inversion : smog ::
   a. sick-building syndrome : indoor air pollution
   b. ZEV : emissions
   c. catalytic converter : emissions
   d. carpets : formaldehyde

_____ **4.** radon : lung cancer ::
   a. ozone : VOCs
   b. ventilation : indoor pollution
   c. asbestos : fire retardant
   d. noise pollution : hearing loss

_____ **5.** shielding : light pollution ::
   a. mold: indoor pollution
   b. scrubber : noise pollution
   c. SO$_2$: acid precipitation
   d. ZEV : air pollution

_____ **6.** acid precipitation : Canada-U.S. Air Quality Agreement ::
   a. sick building syndrome : ZEV
   b. air pollution : Clean Air Act
   c. ventilation : sick-building syndrome
   d. sea-coal : medieval air pollution

_____ **7.** bronchitis : emphysema ::
   a. fossil fuel : nuclear power
   b. ZEV : VOC
   c. pneumonia : lung cancer
   d. lumens : light pollution

_____ **8.** 10 dB : 40 dB ::
   a. pH 2 : pH 5
   b. pH 7 : pH 5.6
   c. 40 dB : 50 dB
   d. pH 1 : pH 10

_____ **9.** acid precipitation : sulfur oxides, nitrogen oxides, water ::
   a. air pollution : dust, pollen, spores
   b. ozone : vehicle emissions, sunlight, oxygen
   c. VOCs : smog
   d. light pollution : sodium lamps

_____ **10.** vehicles, industry : outdoor air pollution ::
   a. nitrogen, oxygen : volcanoes
   b. farming, fires : construction
   c. ear protection : noise pollution
   d. plastics, building materials : indoor air pollution

▌Critical Thinking *continued*

INTERPRETING OBSERVATIONS

Read the following passage, and answer the questions that follow.

Lake Sulfox is having some problems with its fish population. Commercial fishermen are claiming that their catches have declined, and they are blaming the decline on the supposed acidification of the lake by a local coal-fired power plant. The Lake Sulfox Advisory Board has the following data on file. Higher sulfate levels in the lake mean greater acidity. Assume that the size of the fish harvest is a good indicator of the size of the fish population.

Annual Fish Harvest (metric tons)					
1998	**1999**	**2000**	**2001**	**2002**	**2003**
7500	6924	6322	5412	5503	5113

Mean Sulfate Levels (ppm)					
1998	**1999**	**2000**	**2001**	**2002**	**2003**
41.07	51.34	54.89	57.46	58.76	59.65

11. What is the apparent relationship between the size of the fish harvest and the sulfate levels in the lake?

_____

_____

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12. Do the data prove that acidification of the lake by sulfates is responsible for the decline in the lake's fish population? Provide at least two reasons to support your viewpoint.

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Critical Thinking *continued*

AGREE OR DISAGREE

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

13. It is lifestyle choices, such as smoking tobacco, rather than air pollution that causes the large number of respiratory diseases found in today's society.

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_____

_____

14. Mass transit in cities could go a long way to reduce urban air pollution.

_____

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15. Air pollution is an international problem that can only be solved through global treaties.

_____

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_____

16. Noise pollution does not lead to long-term health effects on the human body.

_____

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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.

17. A company plans to correct sick-building syndrome in its headquarters. The company will remove moldy carpeting, install brand-new carpeting, and seal up all cracks in the building in order to keep out new mold and fungus spores. The air ducts will be left alone because they have worked fine for years without any cleaning. Suggest any ways that the company should change its plans, and explain the reason for each change.

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18. The wind blows across Country A and into Country B. Country A has electric power plants that burn fossil fuels, and lakes with a pH of 5.1. Country B has power plants run by moving water (hydroelectric), and lakes with a pH of 4.2. Explain how this can be. What could the two countries do to correct the situation?

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_____

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_____

19. Manufacturing is often blamed for producing air pollution. However, according to economic theory, it is neither technologically feasible nor economically efficient to completely eliminate pollution. What do you think? Explain your reasoning.
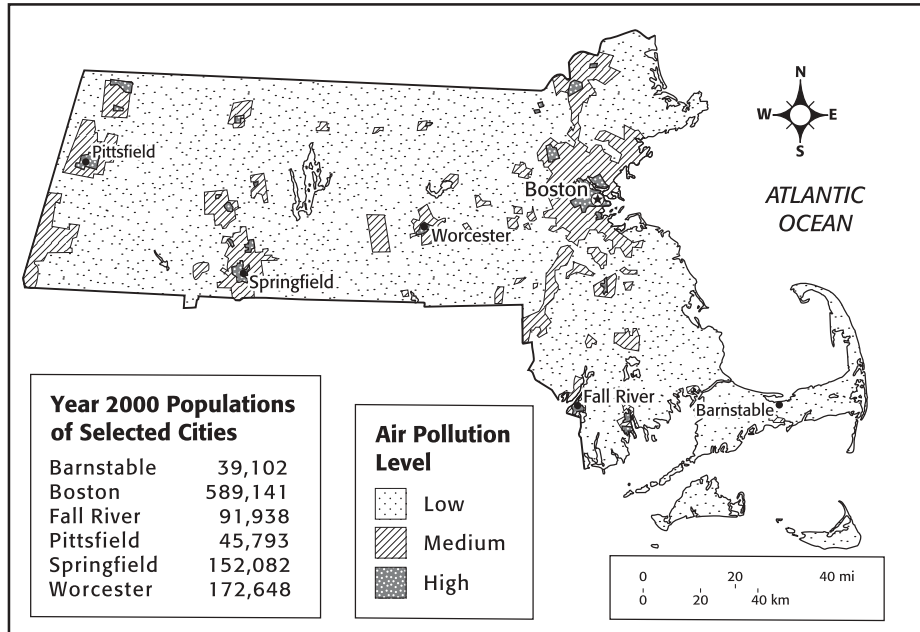
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Skills Worksheet   **POLLUTION LEVELS**

Map Skills

Year 2000 Populations of Selected Cities

Barnstable   39,102
Boston   589,141
Fall River   91,938
Pittsfield   45,793
Springfield   152,082
Worcester   172,648

Air Pollution Level

Low
Medium
High

This map shows air pollution in Massachusetts. Air pollution concentrates over populated areas because human activity is its primary cause.

Use the map above to answer the questions below.

1. **Using a Key** What air pollution level is found over most of the state of Massachusetts?

   _____

2. **Finding Locations** Which selected city has the lowest level of air pollution?

   _____

3. **Inferring Relationships** Generally, where are the highest levels of air pollution located?

   _____

4. **Making Conclusions** Explain the relationship between air pollution and human population.

   _____

   _____

5. **Making a Hypothesis** What do you think the air pollution level is over your region?

   _____