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Date _____ Class _____

Ultraviolet Reflections: Life Under a Thinning Ozone Layer

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SYNOPSIS

Nilsson is a freelance science writer and journalist. In *Ultraviolet Reflections*, she reviews ozone depletion from the perspective of regulatory legislation, scientific papers, and firsthand experience.

Examples of the topics Nilsson examines are skin cancer, decreased food for fish, cataract formation, and global warming.

ANALYZING THE BOOK

Identifying Facts

1. Distinguish between UV-A, UV-B, and UV-C radiation.

2. How thick would the ozone layer be if it were compressed under 1 atm of pressure?

3. When did the decrease in stratospheric ozone become severe enough to be noticed and monitored? List some early explanations of the source of ozone depletion.

ULTRAVIOLET REFLECTIONS continued

- 4.** Why does an increase in smog ozone not compensate for a depletion in stratospheric ozone?

- 5.** List several areas in which UV-B radiation is suspected of playing a destructive role.

Interpreting and Applying Meanings

- 6.** Why does the risk of nonmelanoma cancers decrease when UV-A is factored into the risk-assessment equation?

- 7.** Why should someone who has been sunburned be grateful that the damaged skin peels?

- 8.** Coral bleaching, a sign of global warming, might be caused by UV radiation. What factors indicate that ozone depletion probably does not affect this process?

ULTRAVIOLET REFLECTIONS continued

- 9.** Accurately assessing the environmental risk of increased UV-B radiation involves understanding how UV-B rays interact with other causal agents. List some of these agents.

- 10.** How is stereochemistry involved in the behavior of urocanic acid in immunosuppression?

- 11.** Explain the delayed appearance of reddened skin after long exposure to sunlight.

- 12.** Why are volcanoes not responsible for long-term ozone depletion?

**WRITING
ABOUT THE
BOOK**

On a separate sheet of paper, write your answers to each of the following questions.

Extending the Story

- 1.** In many large cities, people with breathing disorders are warned to stay indoors when the ozone level is high. Explain why.
- 2.** Urocanic acid was thought to be a natural sunscreen before it was declared an immunosuppressant. What were the economic effects of this on the cosmetics industry? Was the industry wrong in fighting to keep sunscreen formulas on the market? Why or why not?

ULTRAVIOLET REFLECTIONS continued**Thinking about Assumptions**

3. Assumptions were made to calculate the risk of skin cancer due to a thinning ozone layer. Discuss why assumptions are necessary when building an experimental model. How might assumptions affect the validity of conclusions drawn from experimental data?

Analyzing the Style

4. Nilsson opens each chapter with an anecdote. Why is this an effective method for introducing her topics? Would this method be as effective if the intended audience were atmospheric chemists?

Writing a Journal Entry

5. Nilsson uses colorful language in her chapter titles. Choose one of the titles, and write a journal entry that compares and contrasts your initial expectations of the chapter's content with the actual content.

**TESTING ON
THE BOOK**

On a separate sheet of paper, write your answers to each of the following questions.

Critical Thinking and Writing

1. An alarmist is a person who incites unfounded fears and warns of nonexistent dangers. In what ways does Nilsson's treatment of ozone depletion mirror alarmist behavior? In what ways does it counter this behavior? Support your discussion with examples from the book.
2. Because supporters and opponents of the sunlight hypothesis cannot reconcile their viewpoints, risk assessments for UV-B radiation as a cause of cataracts are cautiously worded. Discuss how interpretation of data can be affected by personal prejudice and political agendas.