Critical Thinking Skills

Global Warming Big Book

Global Warming: Causes – Global Warming: Effects – Global Warming: Reduction – All three

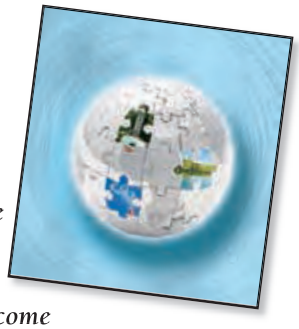
Skills For Critical Thinking		Reading								Hands-on Activities
		Section 1	Section 2	Section 3	Section 4	Section 5	Section 6	Section 7	Section 8	
LEVEL 1 Remembering	• List Details/Facts	✓	✓	✓	✓	✓	✓	✓	✓	✓
	• Recall Information	✓	✓	✓	✓	✓	✓	✓	✓	✓
	• Match Vocabulary to Definitions	✓	✓	✓	✓	✓	✓	✓	✓	
	• Define Vocabulary	✓	✓	✓	✓		✓	✓	✓	
	• Recognize Validity (T/F)	✓				✓	✓			
LEVEL 2 Understanding	• Demonstrate Understanding		✓	✓	✓	✓	✓	✓	✓	✓
	• Explain Scientific Causation	✓		✓	✓	✓	✓	✓	✓	✓
	• Rephrasing Vocab. Meaning	✓	✓	✓	✓	✓	✓	✓	✓	
	• Describe	✓	✓	✓	✓	✓	✓	✓	✓	✓
	• Classify Objects into Group		✓	✓	✓		✓	✓	✓	✓
LEVEL 3 Applying	• Application to Own Life	✓	✓	✓	✓	✓	✓	✓	✓	✓
	• Model Scientific Process	✓	✓	✓	✓	✓	✓	✓	✓	✓
	• Organize and Classify Facts	✓	✓	✓	✓	✓	✓	✓	✓	✓
	• Utilize Alternative Research Tools	✓	✓	✓	✓	✓	✓	✓	✓	✓
LEVEL 4 Analysing	• Distinguish Meanings	✓	✓	✓	✓	✓	✓	✓	✓	
	• Make Inferences	✓	✓	✓	✓	✓	✓	✓	✓	✓
	• Draw Conclusions Based on Facts provided	✓	✓	✓	✓	✓	✓	✓	✓	✓
	• Classify Based on Facts Researched	✓		✓		✓	✓		✓	✓
	• Sequence Events	✓	✓	✓	✓	✓	✓	✓		✓
LEVEL 5 Evaluating	• State and Defend an Opinion		✓	✓	✓	✓	✓	✓	✓	✓
	• Evaluate Best Practices			✓	✓		✓	✓	✓	✓
	• Make Recommendations	✓		✓	✓	✓	✓	✓	✓	✓
	• Influence Community	✓		✓	✓	✓	✓	✓	✓	✓
LEVEL 6 Creating	• Compile Research Information	✓	✓	✓	✓	✓	✓	✓	✓	✓
	• Design and Application		✓	✓	✓	✓	✓	✓	✓	✓
	• Create and Construct	✓	✓	✓	✓	✓	✓	✓	✓	✓
	• Imagine Self in Scientific Role	✓		✓	✓	✓	✓	✓	✓	✓

Based on Bloom's Taxonomy

Teacher Guide

Our resource has been created for ease of use by both TEACHERS and STUDENTS alike.

Introduction



Provide your students an insight into the science of the atmosphere and the effects of humanities actions on the Earth system. Global warming is an important topic for students to understand scientifically. It has become a frequent topic in the news and civic discussions. Students need to acquire a scientific understanding of the role of human activities with regards to changes in the atmosphere in order to make informed decisions about products and lifestyle choices that affect the Earth system. A scientific perspective on climate change will also help students separate fact from fiction in popular accounts of global warming.

How Is Our Resource Organized?

STUDENT HANDOUTS

Reading passages and **activities** (in the form of reproducible worksheets) make up the majority of our resource. The reading passages present important grade-appropriate information and concepts related to the topic. Included in each passage are one or more embedded questions that ensure students are actually reading and understanding the content.

For each reading passage there are BEFORE YOU READ activities and AFTER YOU READ activities. As with the reading passages, the related activities are written using a remedial level of language.

- **The BEFORE YOU READ activities prepare students for reading by setting a purpose for reading. They stimulate background knowledge and experience, and guide students to make connections between what they know and what they will learn. Important concepts and vocabulary from the reading passage are also presented.**
- **The AFTER YOU READ activities check students' comprehension of the concepts presented in the reading passage and extend their learning. Students are asked to give thoughtful consideration of the reading passage through creative and evaluative short-answer questions, research, and extension activities.**

Writing Tasks are included to further develop students' thinking skills and understanding of the concepts. The **Assessment Rubric** *(page 4)* is a useful tool for evaluating students' responses to many of the activities in our resource. The **Comprehension Quiz** *(page 50, 93, 136)* can be used for either a follow-up review or assessment of the completion of the unit.

PICTURE CUES

Our resource contains three main types of pages, each with a different purpose and use. A Picture Cue at the top of each page shows at a glance what the page is for.

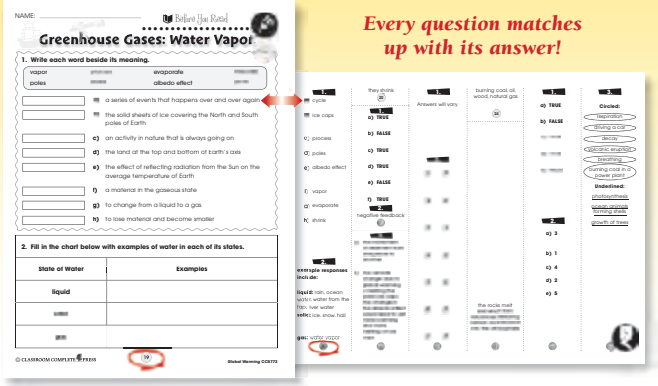
Teacher Guide
- Information and tools for the teacher

Student Handouts
- Reproducible worksheets and activities

Easy Marking™ Answer Key
- Answers for student activities

EASY MARKING™ ANSWER KEY

Marking students' worksheets is fast and easy with this **Answer Key**. Answers are listed in columns – just line up the column with its corresponding worksheet, as shown, and see how every question matches up with its answer!



Before You Read

NAME: _____

Greenhouse Gases: Ozone

1. Complete each sentence with a word from the list. Use a dictionary to help you.

tailpipe	**power plants**	**smog**
fossil fuels	**residence time**	**ozone layer**

a) _____ describes the length of time a material spends in a part of Earth, such as the atmosphere.

b) Greenhouse gases are released when _____ are burned in cars, power plants, and factories.

c) _____ is a mixture of smoke and fog that forms in areas with a lot of air pollution.

d) The _____ stops some harmful radiation from the Sun from reaching Earth's surface.

e) When gasoline is burned in cars, some materials are released out of the _____.

f) Some types of _____ use energy from burning fossil fuels to produce electricity.

2. Label the diagram below using the words in the list.

ozone layer	**troposphere**	**stratosphere**

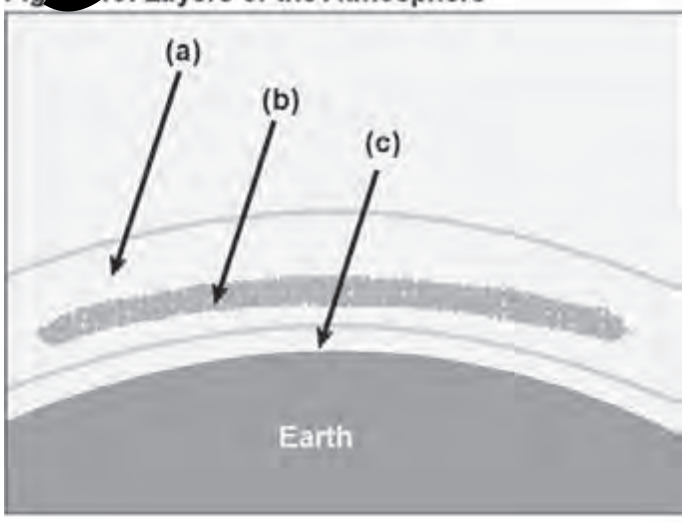


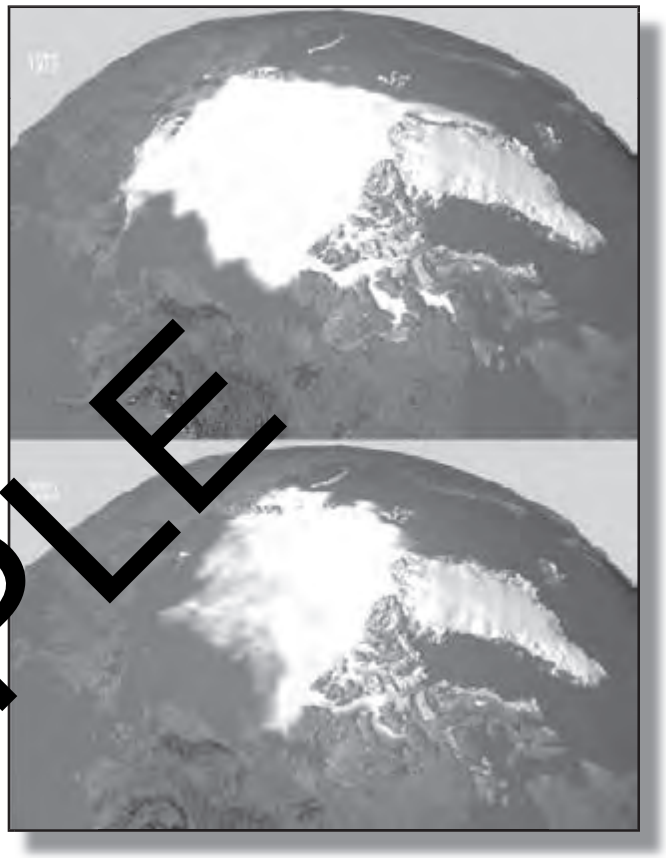
Figure 15. Layers of the Atmosphere

Reading Passage

NAME: _____

Melting Ice Sheets

Scientists have been measuring the size of Earth's ice sheets for many years. **Satellites** in orbit around Earth take photographs that show how much area the ice sheets cover. Scientists also drill down into the ice sheets to find out how deep the ice is in different places. By comparing these measurements from year to year, scientists have discovered that Earth's ice caps are shrinking fast.



Arctic Ice Cap (image courtesy of NASA)

The satellite photograph to the right shows how the size of Earth's northern, or **Arctic**, ice cap has changed since 1979. The ice has become thinner in many places, too. Scientists estimate that the polar ice is shrinking by about 9% a decade. At that rate, the Arctic will no longer have year-round ice by the end of this century. However, certain processes may actually be speeding up the loss of ice. Scientists are finding that the water from melting ice seeps down to the bottom of the ice layer. The liquid water acts as a lubricant, speeding up the movement of ice downhill towards the ocean. As ice moves faster, it heats up more and melts faster.

What happens to the size of Earth's ice caps when global temperature rises?

_____

_____

Melting ice sheets can create **positive feedback**, the kind of process that leads to more and more change. Ice **reflects**, or bounces back, sunlight. When large areas of ice disappear, more sunlight is **absorbed**, or taken in, by Earth's surface. Sunlight is the main source of heat energy in Earth's atmosphere. Therefore, melting ice caps create more warming.

NAME: _____

Lowering Your Greenhouse Gas Emissions

1. Put a check mark (✓) next to the answer that is most correct.

a) Which means of transportation has **no** carbon emissions?

- ○ **A** bus
- ○ **B** bicycle
- ○ **C** carpool van
- ○ **D** commuter train

b) Where are you **most likely** to find fruits and vegetables that were grown close to where you live?

- ○ **A** a mall
- ○ **B** a grocery store
- ○ **C** a farmer's market
- ○ **D** a large chain store

c) Which country has the **highest** greenhouse gas emissions?

- ○ **A** Japan
- ○ **B** Mexico
- ○ **C** South Africa
- ○ **D** the United States

d) Which light bulbs use **less** energy?

- ○ **A** incandescent
- ○ **B** compact fluorescent
- ○ **C** halogen
- ○ **D** natural gas

e) Imagine that you are buying a notebook for school. To help lower greenhouse gas emissions, the **best** choice is a notebook

- ○ **A** wrapped in plastic
- ○ **B** with recycled paper
- ○ **C** shipped from overseas
- ○ **D** made from raw materials