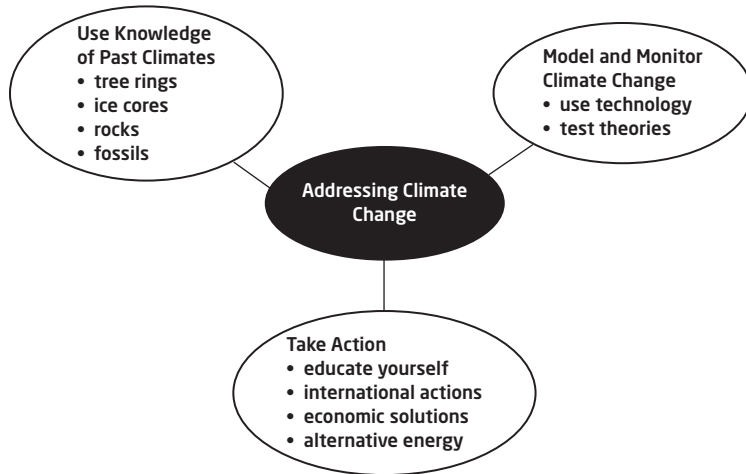


Chapter Review Answers (Student textbook pages 386 and 387)

Please also see **BLM 9-17 Chapter 9 Review (Alternative Format)**.

Make Your Own Summary



Reviewing Key Terms

- | | | |
|------|------|------|
| 1. d | 4. c | 7. e |
| 2. f | 5. h | 8. g |
| 3. i | 6. b | 9. a |

Knowledge and Understanding

- 10.** ice cores, sedimentary rock, tree rings, evidence from fossils and preserved organisms
- 11.** B is a geostationary satellite because it travels around Earth's equator. A is a polar orbiting satellite because it moves north and south over the poles.
- 12.** Satellites changed the ability of scientists to monitor global climate because they can orbit Earth and accurately measure different components of the climate system. They can constantly monitor changes over one area of the planet, or they can monitor the entire planet over several hours.
- 13.** The general circulation model links data about the atmosphere and the oceans together. It uses a computer program and mathematical equations to describe the atmosphere and it allows scientists to manipulate variables that affect how the natural climate system works. Scientists can use the model to predict how the climate might change in the future by changing different variables that are input into the model.
- 14.** Scientists test their models to see how accurately they predict changes that have already occurred. They may also compare results from their model with results from other models. Scientists can develop their climate models by improving the precision of measurements taken of the variables in the system, developing the level of sophistication of variables used, and improving the quality and quantity of the data.
- 15.** The ENERGY STAR® program labels products that meet specifications for reduced energy consumption. This helps consumers choose products that help lower the production of greenhouse gas emissions.
- 16.** Montreal Protocol on Substances That Deplete the Ozone Layer, United Nations Framework Convention on Climate Change, Kyoto Protocol
- 17.** The cap-and-trade system involves a ceiling or cap on how much carbon can be produced. Corporations that produce less than the cap can sell or trade credits to corporations that produce more carbon than their limit. The carbon-tax system involves a tax levied by government on the source of carbon compounds or the emission of greenhouse gases. Consumers are motivated to buy products that are not taxed.
- 18.** It takes time, money and will to convert existing infrastructure used for power generation to alternative energy. Governments are trying to overcome these factors by passing laws, educating people about climate change and alternative energy, and by using cap-and-trade and carbon-tax systems.
- 19.** The molecular weight of water is heavier when the water contains oxygen-18 and lighter when it contains oxygen-16. The relative concentrations of these isotopes in water indicates the temperature at which the ice was formed.

Thinking and Investigation

- 20.** Sources are important because climate models are dependent on the precision and accuracy of the measurements of the variables. A computer model is only as good as the data entered into it.

- 21. Examples of natural variables: wind, temperature, humidity; Examples of anthropogenic variables: carbon dioxide emissions, fossil fuel burning, air travel-induced contrails
- 22. Hydroelectric. Student grades will vary. Example: B. This source of electrical power produces few greenhouse gases, especially compared to the burning of fossil fuels.
- 23. Canada ranks seventh. Canada's contribution to climate change is much smaller than that of the United States. Canada is ranked this way relative to other countries because it has a smaller population than other countries.
- 24. Greenhouse gas levels have increased steadily with industrial activity.

Communication

- 25. Student answers will vary. Their presentations should include information about incorporating natural factors, such as wind, temperature and humidity, and anthropogenic factors, such as greenhouse gas emissions.
- 26. Students' feedback loops should illustrate that a decreased carbon footprint will lead to decreased greenhouse gas emissions, which can lead to decreased global warming.
- 27. Student answers will vary. The Protocol is supposed to be legally binding. Having Canada participate in the Kyoto Protocol sets an example for other countries. If countries participate together in the Protocol, there will be a greater reduction in emissions of four greenhouse gases and two halocarbons. If Canada does not meet its targets, other countries may be less inclined to try to meet the targets.
- 28. Student answers will vary. Encourage students to be creative with their posters and provide examples of carbon offsets an individual could purchase to compensate for other specific activities (for example, donating to a tree-planting program after using a high carbon dioxide emitting form of transportation).

Application

- 29. sedimentary rock and fossils
- 30. Student answers will vary. The value relies on the accuracy and consistency at which the data was recorded. It would be impossible to determine how accurate and consistent the records are. On the other hand, the records use a simple variable that is easily obtained and does not rely on precise measurement.
- 31. Hydroelectric and fossil fuels provide most of Canada's electrical energy. It will take a long time and a lot of money to convert current infrastructure to a system that can use solar and geothermal energy on a large scale.
- 32. Students sketches should show a thin ring for the first year of growth and a wide ring for the following year.
- 33. Some of the countries that are distorted the most on the map would be distorted even more because they are involved in cutting down forests. However, some of the developing countries, such as those in South America or Africa, would appear larger because of their forest-clearing practices.