1. (a) What is a greenhouse gas?

(b) List three greenhouse gases in addition to water vapour.

1. What are some of the causes of long-term climate change?
2. (a) What is a feedback loop?

(b) Give three examples of feedback loops in Earth’s climate system.

1. What are some of the causes of short-term climate variations?
2. What are proxy records? How are they useful to climatologists?
3. Describe two methods a climatologists use to collect climate data from the distant past.
4. What is albedo? What is the albedo effect?
5. Explain how the greenhouse effect works.
6. How can relatively small changes, such as a small drop in the Sun’s radiation, cause large changes to Earth’s climate?
7. (a) When Earth begins to warm up from an ice age, the ice begins to melt. Describe how the

 albedo of ice becomes important at this stage.

(b) Is the albedo effect a positive or a negative feedback loop? Use a diagram to explain.

1. Explain how tree rings are used as proxy records.
2. How do volcanoes influence the climate?
3. (a) Compare how thermal energy circulates in the ocean with how thermal energy circulates in

 the atmosphere.

(b) Why is the circulation of thermal energy around Earth important for living things?

1. The Gulf Stream carries warm water past the west coast of Europe. How would you expect this current to affect the climate of the west coast of Europe?
2. Greenhouse gases trap energy in the atmosphere, causing Earth to be warmer than it would be without greenhouse gases. Use this fact to predict what might happen to Earth’s average temperature in each of the following scenarios: /I

(a) Greenhouse gas levels in the atmosphere increase.

(b) Greenhouse gas levels in the atmosphere decrease.

1. Describe five different signs that indicate that climate change is already affecting the environment we live in. (9.1)
2. What is the connection between fossil fuels and greenhouse gases?
3. The term “anthropogenic greenhouse gases” includes carbon dioxide and other gases. Name three of these other gases. (9.4)
4. (a) In your own words, define “carbon sink.”

(b) Give an example of a carbon sink.

(c) Explain why carbon sinks are important.

1. Scientists believe that today’s climate change is very likely caused by human activity. Summarize the evidence that leads scientists to this conclusion.
2. The greenhouse effect is natural and important to life on Earth. Scientists today are concerned about something called the “anthropogenic greenhouse effect.” U
3. Distinguish between the anthropogenic greenhouse effect and the natural greenhouse

effect.

1. Explain why scientists consider the anthropogenic greenhouse effect to be a problem.
2. Describe the feedback loops illustrating the connection between each variable below and climate change:

 K/U

1. Raising the temperature of the ocean results in more melting of the ice.
2. Higher temperatures result in increased evaporation of moisture from the soil, making it more likely that forest fires will occur, adding carbon dioxide to the atmosphere.
3. Increasing atmospheric carbon dioxide raises the temperature of the ocean, reducing the amount of carbon dioxide that can be absorbed by the ocean.
4. (a) When two variables, such as average world temperature and sea level, change at the same

 time, does this mean that one causes the other? Explain.

1. Think about several reasons or a piece of evidence that strongly suggests that these two things are related. Write an argument of several sentences that you can use to convince friends and family members.
2. Describe four possible global impacts of climate change.
3. List three reasons why it is important to take action to address the issue of climate change. What can you do to take action? (10.4)
4. (a) Give four possible impacts of climate change on Ontario.
5. Which impact do you think will affect you personally the most? Explain why.
6. (a) List three things you do or participate in that result in greenhouse gas emissions.
7. For each of the three things you listed, suggest two alternatives that would result in lower greenhouse gas emissions.
8. Assess how likely it is that you will act on these six suggestions.
9. The issue of sea level rise is attracting a great deal of media attention. Why do you think sea level rise is such an important issue?
10. Why do you think the world is more concerned about climate change in the Arctic than in the Antarctic? Suggest several reasons. (10.2)
11. “A change in climate would affect plants and animals but would not affect our economy.” Evaluate this statement. Explain why you agree or disagree with the statement.
12. What are carbon offset credits? How do they work?
13. Describe Canada’s role in the Kyoto protocol.
14. List 4 energy sources and describe their pros and cons.