Weathering the Changes:
Climate Change in Ontario

Group Members: _____
_____
_____
_____
_____
_____

Trivia Challenge: Search the entire poster to find answers for the following:

1. Approximately how many kilometres separate Ottawa from Toronto?

2. What insect vector (carries and spreads disease) is diagrammed on the poster?

3. What is a "walking school bus"?

Did You Know? Use the pieces of information under this heading ("Did You Know?") on the poster to answer the following true/false (T or F) questions. If the statement is false, cross out the incorrect word or number value, and write in the correct version.

____ Canada's per capita water use is the fifth highest in the world.

____ Every litre of gasoline you use in your car produces almost 1 kg of CO_2.

____ "Jackrabbit" starts consume about 25% more fuel than if you accelerate gradually.

____ Cold-water fish species such as lake trout, may disappear from southern Ontario as their habitat changes.

____ Every year in Ontario, about 1000 forest fires destroy over 290 000 hectares of forest.

____ Using cold water to wash and rinse our clothes saves up to 225 kg of CO_2 per year.

____ Replacing one frequently used regular light bulb with an energy efficient compact fluorescent bulb will save 100 kg of CO_2 per year.

____ 1/3 of the CO_2 emissions generated from human activities comes from transportation.

____ The Great Lakes region is home to 25% of Canada's industries.

____ Venus has an atmosphere that is 98% CO_2, with temperatures around 200 ºC.

The Climate System – A Balancing Act:

1. What 5 elements balance our climate? _____,
   _____, _____, _____,
   _____.

2. Examining the graph showing global temperature change over 10 000 years, when was the greatest change recorded?

3. When did the Little Ice Age take place?

4. What is the projected temperature change by the year 2100?

5. What was the Toronto area like ~20 000 years ago?

6. Record the following percentages of incoming solar radiation:
   ____% absorbed by atmosphere
   ____% reflected by atmosphere
   ____% absorbed by Earth's surface
   ____% reflected by Earth's surface

7. Without greenhouse gases in our atmosphere, what would our planet be like?

8. What are "the big 3" GHGs?
   a) _____
   b) _____
   c) _____

9. Which GHG is produced by landfills and wetlands?

10. What information can ice cores provide?

Future Climate:

1. What is the current concentration of CO_2 in our atmosphere?

2. Extrapolating from the graph, when will you expect the amount of CO_2 in our atmosphere to double today's levels?

3. What is predicted to happen along with climate warming in Ontario?

4. What is a GCM?

5. Examining the global map, what regions are expected to have the most significant temperature changes?

Where We Live:

1. Discuss in your group how YOU will be affected by a warmer climate. Describe several ways.

2. Are storms such as thunderstorms expected to become more or less severe with climate warming?

3. What might have changed (other than climate) that may have contributed to an increase in the number of climate-related disasters?

4. How many households in total lost power in the January 1998 ice storm?

5. Calculate the costs of the ice storm from the transmission tower and wooden utility pole damage.

Our Health:

1. What climate factors affect our health?

2. How many <u>more</u> hot days over 35ºC in southern Ontario are expected (compared to today), by the middle of the next century?

3. How do certain microclimates, such as those found in cities, differ from the surrounding region?

4. What impact will warmer daytime temperatures have on smog?

5. What gas is mapped by concentration in southern Ontario?

6. Around which 2 Great Lakes is the concentration of this gas (from question 5 above) the highest?

7. Would an outdoor summer job in the Lake Erie area be desirable? Why or why not?

Our Water:

1. What looks strange in the Macey's Bay picture of May 15, 2000?

2. What concerns arise when water supplies are warmer?

3. List all of the water movements/exchanges outlined in the hydrological cycle:

4. Lower water levels will decrease shipping costs. True or False?

5. Typically, how much more water does the average household use for flushing toilets than for drinking and kitchen use?

Our Farms:

1. Make a list of the pros and cons of climate warming for farmers in Ontario:

Pros   **Cons**

2. In reviewing these lists, do you think the farmers will benefit, or suffer economically?

Our Forests:

1. Pretend you are a pine tree in Ontario. Write a short story of how you will be affected by climate change.

   "Hi. I am _____, a pine tree in Ontario…."

Our Natural Heritage:

1. What 3 nutrients are exchanged between air, plants, and animals in any ecosystem, as diagrammed?
   a)

   b)

   c)

2. Write "W" for warm-water fish, or "C" for cold-water fish beside each fish below:
   - _____ lake trout
   - _____black bass
   - _____white perch
   - _____sunfish
   - _____lake whitefish
   - _____white bass

3. What is the problem with large populations of snow geese?

How Do We Measure Up?

1. Rank these countries (1 – 9) by 1995 CO_2 emissions:

Canada _____	Italy _____	India _____
U.K. _____	China _____	Russia _____
Japan _____	Germany _____	U.S. _____

2. Look at the house and car. Can one family make changes that can make a difference? Explain.

Where Do We Go From Here?

1. How many nations originally negotiated the Kyoto Protocol?

2. Are we capable of changing for the future as a nation of individuals? Brainstorm with your group to generate ideas of what students in your school could do to "meet the challenge" (i.e. the walking carpool)