

# Geography 12

## January 2000 Provincial Examination

### ANSWER KEY / SCORING GUIDE

---

- Topics:**
1. The Nature of Geography
  2. Systems of the Earth
  3. Resources of the Earth

#### Part A: Multiple Choice

<b>Q</b>	<b>K</b>	<b>C</b>	<b>T</b>	<b>PLO</b>	<b>Q</b>	<b>K</b>	<b>C</b>	<b>T</b>	<b>PLO</b>
1.	D	U	2	2C1	21.	C	U	1	1B4, 2B5
2.	C	K	2	2C3	22.	D	K	1	1A2
3.	C	U	2	2C1, 2C2	23.	C	U	1	1C2
4.	D	U	2	2C1, 2C2	24.	B	U	2	2A3
5.	B	K	1	1B1	25.	D	K	2	2A1, 2A2
6.	A	U	2	2C1	26.	D	U	2	2A3, 2B2
7.	B	K	1	1B2	27.	A	U	2	2B1
8.	A	K	1	1A1	28.	D	K	2	2B2
9.	D	K	2	2D1	29.	A	K	2	2B3
10.	A	K	2	2D3	30.	B	U	3	3B2
11.	B	K	2	2D3	31.	C	K	2	2B3
12.	A	U	3	2D4, 3B3	32.	B	U	1	1B2, 1B4
13.	C	K	2	2D3	33.	C	K	3	3A1
14.	D	U	2	2D3	34.	A	U	1	1C2
15.	B	U	2	2D3	35.	D	U	1	1C1
16.	D	U	2	2D3	36.	B	U	1	1C1
17.	B	U	2	2B3	37.	A	U	1	1C1
18.	D	K	2	2D3	38.	B	U	2	2D3
19.	A	U	2	2D3	39.	D	U	2	2D3
20.	D	U	2	2D3	40.	A	U	3	3A1, 5

**Multiple Choice = 40 marks**

## Part B: Written Response

<b>Q</b>	<b>B</b>	<b>C</b>	<b>S</b>	<b>T</b>	<b>PLO</b>
1.	1	H	6	3	3A3
2.	2	U	5	2	2C3
3.	3	U	4	2	2D2, 2D4
4.	4	U	4	2	2A2, 5
5.	5	H	6	3	3C1
6.	6	H	3	1	1B1
7.	7	H	6	3	3B3
8.	8	H	6	3	3B3
9.	9	H	10	1	1B3, 3C4

**Written Response = 50 marks**

Multiple Choice = 40 (40 questions)

Written Response = 50 (9 questions)

**EXAMINATION TOTAL = 90 marks**

### **LEGEND:**

**Q** = Question Number

**C** = Cognitive Level

**T** = Topic

**K** = Keyed Response

**S** = Score

**PLO** = Prescribed Learning Outcome

**B** = Score Box Number

**PART B: WRITTEN RESPONSE**

**Value: 50 marks**

**Suggested Time: 80 minutes**

**INSTRUCTIONS:** Answer each question in the space provided. You may not need all of the space provided. Answers should be written in **ink**. **Comprehensive answers are required for full marks.**

**REFERENCE  
DATA BOOKLET**

**Use Photograph 2 and the topographic map to answer question 1.**

1. Using the information provided in the air photograph and the topographic map, **summarize** ways that people in the Lumsden region have depended upon, adapted to and modified the environment. Answer in **paragraph** form. **(6 marks)**

**Response:**

<b>Depended</b>	<ul style="list-style-type: none"><li>• There is abundant flat land for extensive farming and for building.</li><li>• This is a farming community which depends on the rich, fertile soils of the region to grow crops and raise livestock (causing a dispersal of the settlement pattern).</li><li>• There is a reliable water source for consumption and irrigation.</li><li>• Chernozem soils have formed on the prairies over centuries in response to the climatic conditions of cold winters, warm summers, and precipitation sufficient enough for grasslands to develop. Some farms are found on the rich alluvial soils of the flood plain, but most lie on the prairie above.</li></ul>
-----------------	---

<p><b>Adaptation / Modification</b></p>	<ul style="list-style-type: none"> <li>• Loss of natural vegetation to farm use and urban growth.</li> <li>• Conditions are suitable for grain production given the precipitation pattern. Reservoirs and dugouts have been built to conserve water supplies for livestock.</li> <li>• Barns have been constructed to house animals and store hay for the winter.</li> <li>• Several bridges for rail and roadways have been built to cross the river; local routes have been built along the valley walls. Facilities such as the ski hill and arena have been built for recreation during the cold, long winters.</li> <li>• Due to the lack of fresh water on the bald prairie and the ever present prevailing winds, the people of this community have chosen to build their town, and the services it provides, on the valley flood plain. In doing so, they risk nature's fury: the flooding of the Qu'Appelle. Dikes have been constructed to channel the water through the town. Check dams have been built on the streams to control flash flooding and to reduce erosion and the threat of mass wasting.</li> <li>• Domestic / agricultural run-off will affect water quality.</li> <li>• New strains of grain are drought-resistant.</li> <li>• Gravel extraction for road, rail and housing.</li> <li>• Establishment of a sewage treatment plant.</li> <li>• Creation of a dump.</li> <li>• Road and rail cuttings and embankments.</li> </ul>
<p><b>Note to Markers:</b>  <b>This question is to be marked holistically. 1 mark is to be deducted for not using paragraph form. <math>\frac{1}{2}</math> marks are awarded for partial answers.</b></p>	

**Use the map on page 20 to answer question 2.**

2. a) Explain why most of the volcanic ash from the eruption of Mount St. Helens fell to the east of the volcano. **(1 mark)**

**Response:**

<b>Most of the ash from this eruption fell to the east because</b>	<ul style="list-style-type: none"> <li>• the wind was blowing from the west. As the wind continued throughout the eruption, the ash fell to the east of the volcano, out across much of North America.</li> <li>• of prevailing winds.</li> <li>• of westerly winds.</li> <li>• of the jet stream.</li> <li>• of winds from the ocean.</li> <li>• of winds blowing to the east.</li> </ul>
<b>Note to Markers: Just wind without any explanation is awarded <math>\frac{1}{2}</math> mark.</b>	

- b) Other than the fallout of ash, state **two** problems caused by the 1980 eruption of Mount St. Helens. **(2 marks)**

**Response:**

<b>Problems</b>	<p><b>The eruption of Mount St. Helens caused</b></p> <ul style="list-style-type: none"> <li>• flooding.</li> <li>• mudflows (lahars).</li> <li>• landslides.</li> <li>• weather / climate alterations.</li> <li>• a temporary climate change.</li> <li>• the deaths of about 50 people.</li> <li>• loss of jobs (forestry industry).</li> <li>• nuée ardentes (pyroclastic flows).</li> <li>• bridges, roads and homes destroyed.</li> <li>• damage to engines of cars, trucks and aircraft.</li> <li>• contamination of fresh water supplies (acidification).</li> <li>• the destruction of forests, wildlife habitat and wildlife.</li> <li>• towns and cities of eastern Washington and the Idaho panhandle to have to pay for clean-up.</li> <li>• the need to evacuate some settlements.</li> <li>• an increase in pollution.</li> <li>• an increase in acid precipitation.</li> </ul>
-----------------	--

c) Describe **two** positive impacts of volcanic activity.

**(2 marks)**

**Response:**

<b>Positive Impacts</b>	<ul style="list-style-type: none"><li>• periodic lava deposits renew the soil / or create new land</li><li>• lava and ash will weather into fertile soil</li><li>• luxuriant forests will grow in tropical regions</li><li>• volcanic peaks are often used for recreation (e.g., Mt. Baker — climbing and winter sports)</li><li>• upward movement of magma is responsible for the formation of many metallic ore bodies</li><li>• underground water reacts with heat from magma to create features like hot springs and geysers with tourist value (e.g., Yellowstone Park)</li><li>• creates geothermal energy which can be harnessed to generate heat and electricity (e.g., New Zealand, Iceland)</li><li>• volcanic events invite tourism opportunities</li><li>• provides opportunities for study and research</li></ul>
-------------------------	--

3. a) Identify **two** natural factors which make structures like the one shown in the photograph necessary. **(2 marks)**

**Response:**

<p><b>These structures are necessary because of</b></p>	<ul style="list-style-type: none"> <li>• earthquakes.</li> <li>• steep slopes.</li> <li>• heavy snowfall, and the possibility of avalanches.</li> <li>• wet conditions in the spring, creating slide conditions.</li> <li>• physical weathering (frost shattering).</li> <li>• mass wasting (under the influence of gravity).</li> </ul>
---	--

- b) How might the effects of mass wastage be minimized in areas similar to the one in the photograph? **(2 marks)**

**Response:**

<p><b>Transportation routes can be maintained through</b></p>	<ul style="list-style-type: none"> <li>• rock scaling.</li> <li>• reforestation / restricting logging activity.</li> <li>• concrete barriers.</li> <li>• bolting rock faces.</li> <li>• cementing rock faces.</li> <li>• posting warning signs.</li> <li>• putting screens / nets on sides of cliffs.</li> <li>• snow ploughing during the winter months.</li> <li>• the channelling of flood waters during spring run-off.</li> <li>• avalanche control (diversion channels, controlled avalanche triggering).</li> <li>• monitoring conditions; providing highway and radio reports.</li> <li>• avoiding slope destabilization (avoid using undercuts).</li> </ul>
---	--

Select one of the following to answer question 4.  
Indicate your selection with a ✓.

Convective Rainfall

Effect of Aspect on Temperature

4. a) With the aid of a clearly labelled diagram, explain either convective rainfall or the effect of aspect on temperature. (3 marks)

**Response:**

**CONVECTIONAL RAINFALL**

The diagram illustrates a convection cell. At the bottom, a shaded area represents the ground, which is heated by the sun. This causes the air above it to rise. As the air rises, it expands and cools. At a certain height, the dew point is reached, and condensation occurs, forming a cumulonimbus cloud. Inside the cloud, the air continues to rise and cool, leading to heavy rain. The rain falls, and the air then sinks back down to the ground, completing the cycle. The diagram is divided into five numbered steps:

- 1** The ground is heated by the sun. The hot ground heats the air above it.
- 2** Hot air expands and rises rapidly.
- 3** Dew point is reached and condensation occurs.
- 4** Rapidly rising air continues to condense to high altitudes. A cumulonimbus cloud forms. A short heavy downpour follows, often accompanied by lightning and thunder.
- 5** Air cools, contracts and sinks.

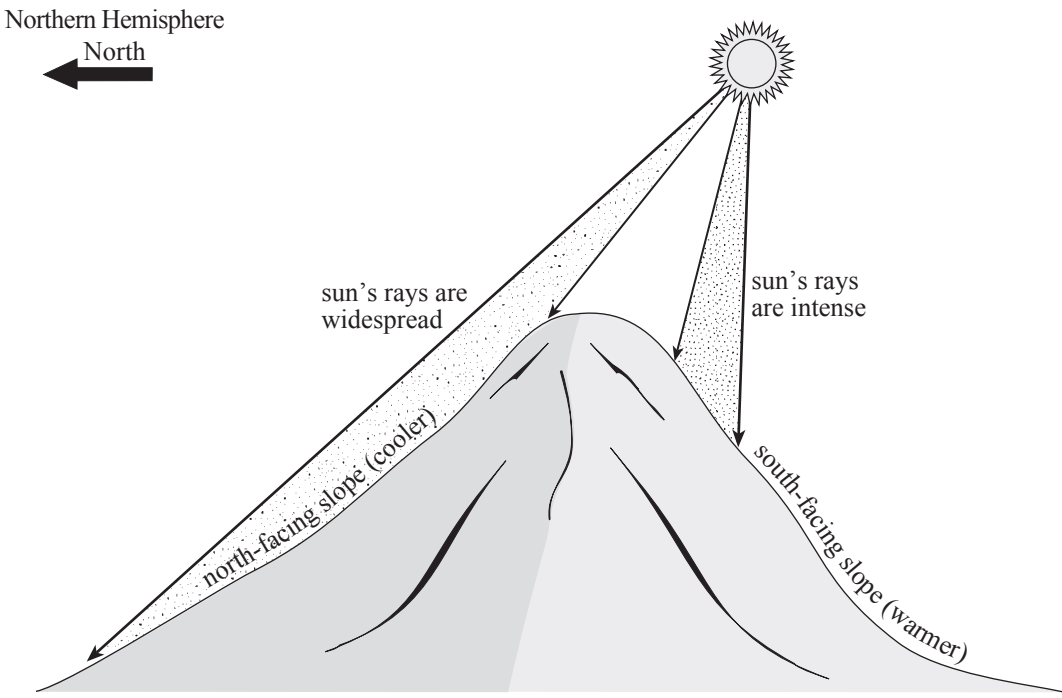
Labels in the diagram include: 'cumulonimbus cloud', 'sun', 'condensation level', 'updraught', 'downdraught', and 'convection cell'.

Updrafts of air resulting from surface heating in summer rise and then cool adiabatically. The condensation point is reached and is indicated by the flat base of a cumulus cloud formation. Rain begins to fall. As water condenses, heat is released, which further "fuels" the storm.

**Note to Markers:**  
**This question to be marked holistically. The explanation may be shown in the diagram. Both evaporation and condensation received one mark. Half marks were awarded for partial answers.**



**Response:**

<b>EFFECT OF ASPECT ON TEMPERATURE</b>	
 <p>The diagram illustrates a mountain with two slopes. The sun is positioned in the upper right, representing the Northern Hemisphere. An arrow labeled 'North' points to the left. Sun's rays are shown hitting the mountain. On the left, the 'north-facing slope (cooler)' is shown with 'sun's rays are widespread' over a large area. On the right, the 'south-facing slope (warmer)' is shown with 'sun's rays are intense' as they are concentrated on a smaller area.</p>	
<p>Aspect is the compass direction that a slope faces. For instance, a slope that faces due south has an aspect of 180°. The sun's rays are more direct on south-facing slopes in the northern hemisphere, resulting in warmer temperatures. North-facing slopes are cooler in comparison.</p>	
<p><b>Note to Markers:</b> <b>This question to be marked holistically. The explanation may be shown in the diagram. Half marks were awarded for partial answers.</b></p>	

b) Explain **one** effect your selection has on human activity.

**(1 mark)**

**Response:**

<b>The influence of convectonal rainfall on human activity</b>	<ul style="list-style-type: none"><li>• flash floods</li><li>• power outages / recharge of reservoirs</li><li>• hail destroys crops</li><li>• soil erosion (gullyng)</li><li>• influence on day-to-day activities (sporting and recreational activities)</li><li>• rain for irrigation (water recharged)</li><li>• lightning starts forest fires and can create human peril (e.g., striking golfers, baseball players, etc.)</li><li>• road transportation more hazardous</li></ul>
<b>The influence of the effect of aspect on temperature on human activity</b>	<ul style="list-style-type: none"><li>• ski hills and other facilities</li><li>• micro-climates</li><li>• forestry activities</li><li>• tinting of windows</li><li>• use and location of solar radiation cells</li><li>• vegetation type changes with progression upslope</li><li>• real estate values (south-facing)</li><li>• habitat (house design and location)</li><li>• location of agricultural activities (grapes)</li></ul>

5. a) Suggest **three** impacts species extinction will have on the sustainability of life on earth. (3 marks)

**Response:**

<b>Explanation</b>	<ul style="list-style-type: none"><li>• Loss of oxygen-generating organisms.</li><li>• Loss of soils as ground cover is lost.</li><li>• Stability of ecosystems will be upset.</li><li>• Loss of biodiversity could result in the eradication of entire species, which would threaten our food supply.</li><li>• For every plant lost due to extinction, 20 to 40 animals are threatened.</li><li>• Loss of genetic resources (reduction in gene pool means the ability to transfer genes from one generation to next will be reduced).</li><li>• Overpopulation of one species, under population of another.</li><li>• Reduction in species means the potential loss of new medicines (e.g., cyclosporin which prevents transplant rejection in humans).</li><li>• Reduction of species means different species of plants for improving agriculture may be lost (disease-resistant tomatoes found in South America).</li><li>• Disruption or alteration of the food chain will impact food supply (marine resources).</li><li>• Disruption of cultural icons or belief systems.</li></ul>
--------------------	--

b) Identify and explain **three** causes of species extinction.

**(3 marks)**

**Response:**

<b>Causes of Species Extinction</b>	<ul style="list-style-type: none"><li>• deforestation</li><li>• desertification</li><li>• loss of habitat</li><li>• global warming</li><li>• ozone depletion</li><li>• natural disasters</li><li>• loss of food source</li><li>• commercial hunting</li><li>• pollution (air and water)</li><li>• perceived need for pest control</li><li>• over extraction of resources (fishing)</li><li>• lack of international agreements</li><li>• biocides (toxic substances, e.g., DDT)</li><li>• the introduction of foreign species (accidental or deliberate)</li><li>• poaching / trade in animal parts — cultural tradition, remedies (bear gall bladder, rhino horns)</li><li>• exotic pet collections — some people place a high value on the ownership of rare species, despite its illegality</li><li>• fashion — coats and boots are often made out of the skins and pelts of rare species (tigers)</li><li>• overpopulation</li><li>• urbanization — as humanity spreads into frontier lands, animal habitat is lost</li><li>• natural selection</li></ul>
-------------------------------------	--

6. Explain **three** consequences of the uneven distribution of fresh water on this planet. (3 marks)

**Response:**

<p><b>The effects of the uneven distribution of water</b></p>	<ul style="list-style-type: none"> <li>• Though the world’s fresh water supply is being replenished by rainfall, rainfall distribution and volume vary significantly. Parts of the world suffer droughts (e.g., parts of Africa, Australia, Asia, the Middle East). Some parts of the world suffer from floods. Water supply is unevenly distributed. Distribution of population is related to the water supply. Areas that have little water tend to have very few people as do areas with extremely heavy rainfall. The largest populations are located where water is adequate.</li> <li>• Water diversion upstream reduces downstream flow and impacts water quality. Water diversion is often required in order for arid regions to be populated (e.g., Southern California). Water diversion can give rise to water misuse (over irrigation leading to salinization).</li> <li>• In regions of water deficiencies, conflicts over choices develop (e.g., hydro-electric development versus fishing — Columbia River; disruption of downstream benefits for agriculture — Egypt). Political conflicts erupt between states over water supply. Canada is being pressured to sell water to the United States. Potential conflict with countries sharing the Nile River.</li> <li>• War: water is more precious than oil.</li> <li>• Points out the need for increased education efforts to achieve conservation and more informed water use.</li> <li>• Points out the need for more efficient water use, emphasizing conservation, needs to be employed to enable humans to succeed in water deficient regions (e.g., drip irrigation and other water management techniques).</li> <li>• Areas with an overabundance of water may want to devise various means to divert or store water. In many tropical regions with heavy downpours of rain, very little can be done.</li> <li>• Subsidized water by government.</li> <li>• Salinization plants may need to be built.</li> <li>• Selling of water.</li> <li>• Disputes over riparian rights (e.g., Colorado / Mexico).</li> <li>• Water can be used as a weapon (e.g., poison / toxins) by poisoning downstream flow (e.g., Turkey, Syria, Israel).</li> <li>• The availability or unavailability of water affects the quality of life.</li> <li>• Drought, which could lead to famine and death.</li> <li>• As water becomes more scarce, the technology required to obtain it often increases in cost too.</li> </ul>
---	--

Select one of the following environmental problems to answer question 7.  
Indicate your selection with a ✓.

Temperate Deforestation       Tropical Desertification

7. a) With respect to the environmental problem you have selected, state **two** impacts it has on the hydrosphere. **(2 marks)**

**Response:**

<p><b>Temperate Deforestation</b></p>	<ul style="list-style-type: none"> <li>• global warming leading to melting ice caps / increased desertification</li> <li>• flooding</li> <li>• stream siltation</li> <li>• loss of transpiration</li> <li>• decreased infiltration rates</li> <li>• alteration of the water cycle</li> <li>• pollution from machinery</li> <li>• water temperatures rise (loss of shade) or rising water temperatures</li> <li>• micro-climate change (reduced evaporation and precipitation / changed global precipitation patterns)</li> </ul>
<p><b>Tropical Desertification</b></p>	<ul style="list-style-type: none"> <li>• drought / water quality drops</li> <li>• diversion of water</li> <li>• competition for water</li> <li>• alteration of the water cycle</li> <li>• groundwater supplies are depleted</li> <li>• micro-climate change (reduced evaporation and precipitation)</li> <li>• flooding (inability to absorb water when the ground is baked dry)</li> </ul>

b) With respect to the environmental problem you have selected, outline **two** impacts it has on human activity. **(2 marks)**

**Response:**

<p><b>Temperate Deforestation</b></p>	<ul style="list-style-type: none"> <li>• increased flooding and its effects</li> <li>• initially creates new jobs (lumber products) and new tax base, then as the deforestation increases, there can be a loss of jobs and a loss of tax base</li> <li>• climate change</li> <li>• loss of recreational and tourism opportunities</li> <li>• species depletion</li> <li>• permanent deforestation</li> <li>• new habitat or biome created</li> <li>• loss of possible medical cures</li> <li>• depletion of valuable resources</li> <li>• afforestation programs create new job opportunities and expand tax bases</li> <li>• increased likelihood of conflicting ethics (environmentalists vs. pro-logging)</li> <li>• urbanization of deforested areas susceptible to increased mass wasting in sloping areas</li> </ul>
<p><b>Tropical Desertification</b></p>	<ul style="list-style-type: none"> <li>• job loss in ecotourism</li> <li>• gene pool depletion / loss of potential medicines</li> <li>• climate change</li> <li>• increase in disease in people</li> <li>• reduction in agricultural production</li> <li>• starvation due to loss of food supply</li> <li>• increased pressure on water supplies</li> <li>• people and herds are forced to migrate to oases where water supplies have not been depleted</li> <li>• short term positive impacts include food production and fuel source prior to desertification</li> </ul>

c) Propose **two** solutions to the environmental problem you have selected.

**(2 marks)**

**Response:**

<b>Temperate Deforestation</b>	<ul style="list-style-type: none"><li>• silviculture</li><li>• afforestation</li><li>• reforestation</li><li>• strict forest codes / passing more rigorous laws / imposing higher fines / posting bonds to ensure responsible cleanup</li><li>• smaller allowable cuts</li><li>• find ways to reduce demand for wood products / explore the use of alternative materials</li><li>• close government inspections</li><li>• value-added industries</li><li>• restricting raw log sales</li><li>• sustainable forest practices</li><li>• recycling paper and wood products</li><li>• selective cutting / variable retention</li><li>• creating more parks and reserves</li></ul>
<b>Tropical Desertification</b>	<ul style="list-style-type: none"><li>• birth control education / inducements</li><li>• relocation to less populated areas</li><li>• zero tillage / stubble farming</li><li>• fence herds</li><li>• trash farming</li><li>• crop rotation / return to traditional crops</li><li>• plant wood lots</li><li>• plant shelter belts</li><li>• reforest denuded areas</li><li>• tree farms for fuel wood</li><li>• plant drought resistant crops (flax)</li><li>• return marginal land to natural state</li><li>• education of farmers in dry-land farming techniques</li><li>• reduce herd size; pay attention to livestock carrying capacity</li></ul>



Use the following cartoon to answer question 8.



\* A/C = air conditioning

Jim Borgman. Reprinted with permission—The Toronto Star Syndicate. Copyright: King Features Syndicate.

8. a) What is the intent of the cartoonist's message?

(1 mark)

**Response:**

<p><b>The intent of the cartoonist's message</b></p>	<ul style="list-style-type: none"><li>• Some individuals are not taking the threat of global warming seriously. Since it is a long-term condition that causes changes, they do not see the immediate consequences of their actions.</li><li>• They believe they can live with the problem by using air conditioning, which has proven to be a cause of ozone depletion which, in turn, increases global warming.</li><li>• Affluence can allow for artificial climate control / modification, while actually compounding the problem.</li><li>• To increase awareness of a major global threat.</li><li>• To point out the arrogant attitudes of those who live merely for today, with no thought for the future.</li><li>• Many are involved in a cycle of greed: the individual, the vehicle salesman and the manufacturer.</li><li>• The consumer is poorly educated as to the consequences of purchasing decisions, or does know and is unconcerned.</li></ul>
--	--

b) Describe **two** effects global warming may have on agriculture.

**(2 marks)**

**Response:**

<b>Effects global warming may have on agriculture</b>	<ul style="list-style-type: none"><li>• severe drought</li><li>• animal migration routes would be changed</li><li>• increased food prices</li><li>• flooding of coastal farms</li><li>• less rainfall due to increased evaporation</li><li>• reduced availability of water for irrigation</li><li>• introduction of new crops and plant species</li><li>• scorching of crops, which leads to their destruction</li><li>• need to alter current farm techniques to dry-land farming</li><li>• more weeds, insect infestations and outbreaks of disease</li><li>• northern regions will have longer and warmer growing seasons</li><li>• increased frequency of severe storms (hail / rain) could destroy crops</li><li>• more nitrogen fertilizers will be needed to counter high CO<sub>2</sub> levels</li></ul>
---	--

- c) Explain three **different** strategies that Canadians can use to reduce their reliance on fossil fuels. **(3 marks)**

**Response:**

<p><b>Canadians can reduce their reliance on fossil fuels by</b></p>	<ul style="list-style-type: none"> <li>• composting and recycling.</li> <li>• reducing plastic packaging.</li> <li>• purchasing more energy efficient appliances.</li> <li>• selecting products for quality and durability.</li> <li>• building more fuel-efficient cars and machines (research / experimentation).</li> <li>• reducing consumption of petroleum-based products (plastics).</li> <li>• reforming building codes to ensure greater energy efficiency.</li> <li>• recycling and reusing plastic containers or replacing with glass containers.</li> <li>• developing alternative energy sources (hydro, wind, solar, tidal, geothermal).</li> <li>• reducing the number of cars on the road (car pool, transit, limit the number of days people can drive).</li> <li>• increasing alternative transit networks, including light rail and shuttle buses.</li> <li>• telecommuting (saving commuting time and reducing automobile emissions).</li> <li>• government action (setting targets and priorities; limiting the import / export of fossil fuels; raising the cost of fossil fuels).</li> <li>• supporting research and development projects to promote energy efficiency and renewable energy.</li> <li>• phasing out national policies, such as fossil fuel subsidies, that distort energy prices.</li> </ul>
<p><b>Note to Markers:</b></p> <p><b><math>\frac{1}{2}</math> marks can be awarded where a simple listing was given with no accompanying explanation.</b></p>	

9. Using evidence from the case study in the data booklet and your understanding of geography, assess the impact of physical and human interactions within the North Sea ecosystem. Explain the difficulty in achieving solutions to the pollution problems in the region. Answer in **multi-paragraph** form. **(10 marks)**

**Response:**

<p><b>Human and Physical Interactions</b></p>	<ul style="list-style-type: none"> <li>• The North Sea ecosystem is an example of the negative interaction of biotic and abiotic elements within an inter-related environment. More specifically, it shows the human / physical relationship of a system.</li> <li>• As a direct result of a reduction in the effects (flushing action) of ocean currents, partially enclosed seas (such as the North Sea) are extremely vulnerable to the polluting of its coastal waters.</li> <li>• Reduced current action means that pollutants, discharged by the various bodies of water — notably the Thames and Rhine Rivers — are highly concentrated in inland coastal waters.</li> <li>• The river-ways provide a natural transportation corridor sin the interior of the continent and act as conduits for pollution.</li> <li>• Once areas of incredible agricultural importance, the now heavily populated flood plains of the Thames and Rhine River valleys are currently responsible for a large percentage of western Europe’s industrial output.</li> <li>• Toxic chemicals (including PCBs, heavy metals such as lead and cadmium, as well as organic compounds), sewage, and fertilizers (particularly nitrogen and phosphorus) are discharged into the streams and rivers that eventually drain into the North Sea.</li> <li>• These contaminated waters have enormous effects within the related ecosystem (e.g., effects on human health, destruction of plant and animal species, toxic effects on soils and alluvial deposits downstream).</li> <li>• In addition to contaminated fluvial discharges (which are distributed along coastlines through littoral action hundreds of kilometers from their sources of origin), the North Sea is used as a major sea-way transportation route (evidenced by large oil slicks on the surface) and a dumping ground for incinerated chemical wastes.</li> <li>• The effects on North Sea marine organisms have been nothing short of catastrophic: an estimated 500 000 sea birds die annually from contamination by toxic chemicals or oil spills; high incidences of fish diseases and seal deaths are directly related to the toxic effects of water from industry and the algae bloom growth from agricultural discharges.</li> </ul>
---	--

<p><b>Difficulty in achieving solutions to the problem in the geographic region</b></p>	<p>International cooperation to clean up the North Sea is essential, but is thwarted by</p> <ul style="list-style-type: none"> <li>• the NIMBY syndrome and environmental and social irresponsibility: individuals and groups responsible for the sources of the pollutants are often far removed (physically) from the areas that experience the greatest impact. Moreover, people allow the dumping of industrial, domestic, and agricultural discharges to go on simply because <i>if it is out of sight...it is out of mind</i>.</li> <li>• the lack of governmental and inter-governmental regulations — coupled with the lack of political will — allows individuals and groups to dump wastes.</li> <li>• apathy, a consumer-oriented lifestyle and the sheer cost of the clean-up inhibit the development of solutions.</li> <li>• the power of multinational corporations and agricultural lobby groups which stymies proactive initiatives.</li> <li>• the problem which is a historical one.</li> <li>• the nature of the environment (an enclosed sea) which makes it difficult to control.</li> <li>• population pressures which make change difficult to implement.</li> <li>• the absence of an international body which could decide who contributed what and how much to the problem?</li> </ul>
<p><b>Note to Markers:</b>  <b>This question is to be marked holistically.</b></p>	

**END OF KEY**