

Geography 12

August 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

Q	K	C	T	CGR		Q	K	C	T	CGR
1.	A	U	2	2C1		21.	C	U	2	2D3
2.	A	U	2	2C1		22.	D	U	1	1B1
3.	B	U	2	2C2		23.	D	U	2	2A3
4.	C	U	2	2C1		24.	B	U	2	2A4
5.	A	K	2	2C1		25.	D	U	2	2B1
6.	D	K	3	3A1		26.	A	K	2	2A4
7.	A	K	3	3A4		27.	D	K	1	1B4
8.	B	K	2	2D3		28.	A	U	1	1A1
9.	B	U	2	2D3		29.	B	K	2	2B3
10.	B	U	2	2D3		30.	A	K	2	2B4
11.	D	U	2	2D3		31.	B	K	2	2B3
12.	C	U	2	2D3		32.	A	U	3	3A1
13.	B	U	3	3A4		33.	D	U	1	1B4
14.	B	K	2	2D3		34.	B	U	1	1B4
15.	D	U	2	2D3		35.	B	U	1	1C1
16.	B	U	2	2D3		36.	D	U	1	1C1
17.	D	U	2	2D3		37.	B	U	1	1C1
18.	A	U	2	2D3		38.	D	U	1	1C1
19.	D	U	2	2D3		39.	B	U	2	2D3
20.	C	U	1	1B2		40.	D	U	2	2B3

Multiple Choice = 40 marks

Part B: Written Response

Q	B	C	S	T	CGR
1.	1	H	6	3	3C1
2.	2	U	4	2	2D2
3.	3	U	4	2	2A2
4.	4	U	6	3	3B1
5.	5	H	4	3	3B2
6.	6	H	6	3	1B4, 3B2
7.	7	U	5	3	3A3
8.	8	H	5	1	1A3, 2B5
9.	9	H	10	3	3B3

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.**

Use the air photograph and topographic map of Dryden on pages 21 and 23 to answer question 1.

1. The Dryden community relies upon the resources of the forest. Describe how Dryden’s prosperity depends upon the forest industry and propose a plan which will help ensure the sustainability of the resource. Answer in **paragraph** form. **(6 marks)**

Response:

Dependency	<ul style="list-style-type: none"> • The infrastructure of the town is built around the needs of the mill: hydro-electricity, roads, rail, the site for the mill, use of the water supply, etc. • The citizen services such as the hospital, seniors’ homes, policing and fire protection depend on the success of the mill. • People depend upon the mill for jobs; business people in turn depend upon these people (truckers, millworkers and loggers) spending their earnings in the community. Money then circulates, creating more jobs. • All levels of government rely on the forestry industry for some of its tax revenue; money then circulates, creating other jobs. • The continued successful operation of the mill depends on the availability of the timber supply. • Dependence on the pulp and paper market in a highly competitive global economy.
Sustainability	<p>Though a renewable resource, the forests must be carefully managed in order to sustain the industries that depend on them. Management plans need to include the following:</p> <ul style="list-style-type: none"> • sustainable annual allowable cuts • laws and penalties to enforce regulations • use of variable retention methods of harvesting • licensing schemes to ensure long-term commitment • silviculture practices to tend the forest as it grows (seeding, thinning, fertilizing) • reforestation of newly harvested areas and manual reforestation of previously cut areas • land use plans, taking into account the impact of forestry on the environment (hydrology, soil analysis, wildlife patterns) • working with First Nations people

Use the following photograph to answer question 2.



2. a) Identify and explain a weathering process illustrated in the photograph above. (2 marks)

Response:

Weathering Process	Explanation
Frost Fracturing / Freeze-thaw Weathering	<ul style="list-style-type: none">• water seeps into cracks, joints, rock strata or bedding planes and freezes• 9% increase in water volume results in widening of crack (process is continued until rock fragment separates from parent rock)
Thermal Expansion / Exfoliation	<ul style="list-style-type: none">• extreme diurnal ranges in temperature result in rock fracturing and peeling of outer layers of the rock surface
Biological Activity	<ul style="list-style-type: none">• the action of root growth displaces rock fragments and weakens rock structure
Solution	<ul style="list-style-type: none">• acids released from dead / decaying plants and animals chemically weaken the rock structures, making the rock vulnerable to erosive agents

b) Explain **two** effects weathering processes, in general, may have on human activity. **(2 marks)**

Response:

Effects of weathering on human activity	<ul style="list-style-type: none">• tourism / recreation (rock climbing)• rusting, oxidation (buildings / vehicles)• frost fracturing — destruction of roads• sinkholes cause subsidence, undermining structures• leads to mass wasting — blocking of transport routes and cutting of communication lines (rock falls / landslides / mudflows)• structural deterioration of buildings and statues due to carbonation, incurring costs for maintaining and repairing them• loss of life from rock falls, landslides and mudflows• financial burden to maintain transportation routes / slope stability• rock debris from scree slopes are a source of gravel• research and development opportunities
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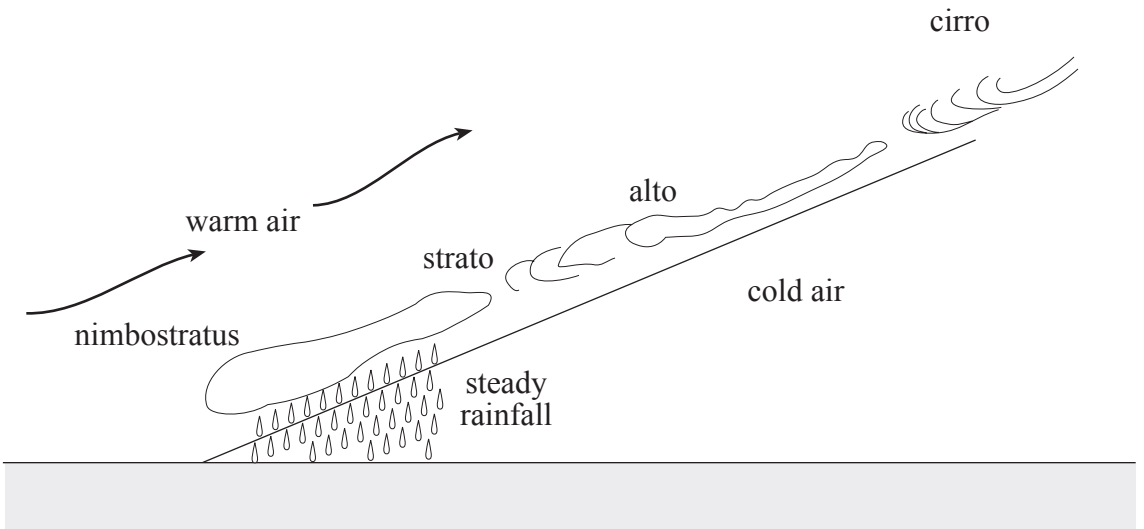
**Many factors influence climate.
Select one of the following to answer question 3.
Indicate your selection with a ✓.**

Precipitation Associated with a Warm Front

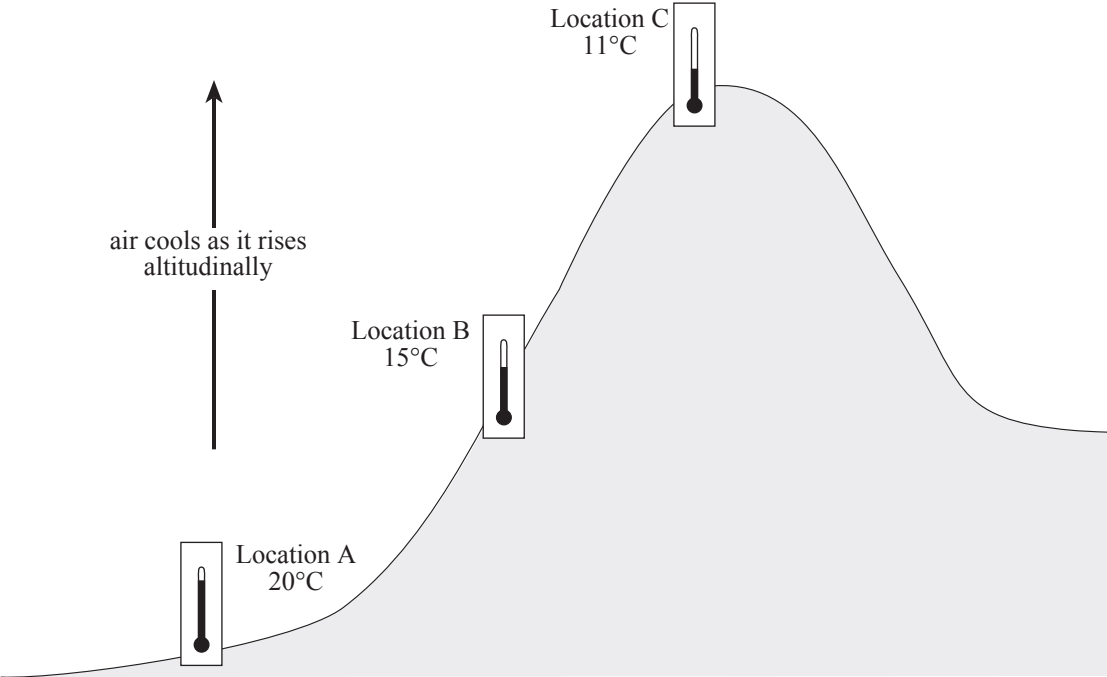
Influence of Altitude / Elevation on Temperature

3. a) With the aid of a clearly labelled diagram, explain how precipitation associated with a warm front occurs **or** how altitude / elevation influences temperature. **(3 marks)**

Response:

PRECIPITATION ASSOCIATED WITH A WARM FRONT

<p>Two air masses of different temperatures meet. Warm air is less dense than cold air, therefore, the warm, moist air is forced to rise as it encounters a denser, colder air mass. As the warm air rises, it is cooled and the relative humidity reaches 100%, the condensation point. Nimbostratus clouds form, resulting in rain.</p>
<p>Note to Markers: This question to be marked holistically. The explanation may be shown in the diagram.</p>

Response:

INFLUENCE OF ALTITUDE / ELEVATION ON TEMPERATURE	
 <p>The diagram illustrates the relationship between altitude and temperature. It shows a mountain profile with three locations marked: Location A at the base (20°C), Location B on a slope (15°C), and Location C at the peak (11°C). Each location has a thermometer icon. An upward-pointing arrow is accompanied by the text 'air cools as it rises altitudinally', indicating the process of adiabatic cooling.</p>	
<p>Air in the troposphere gets colder with an increase in elevation. When air rises, the pressure on it decreases; the air expands and cools. The environmental lapse rate refers to how much colder air gets with height. The adiabatic lapse rates (wet and dry) deal with how fast specific parcels of air cool as they rise.</p>	
<p>Note to Markers: This question to be marked holistically. The explanation may be shown in the diagram.</p>	

b) Explain an effect the process you have selected has on human activity.

(1 mark)

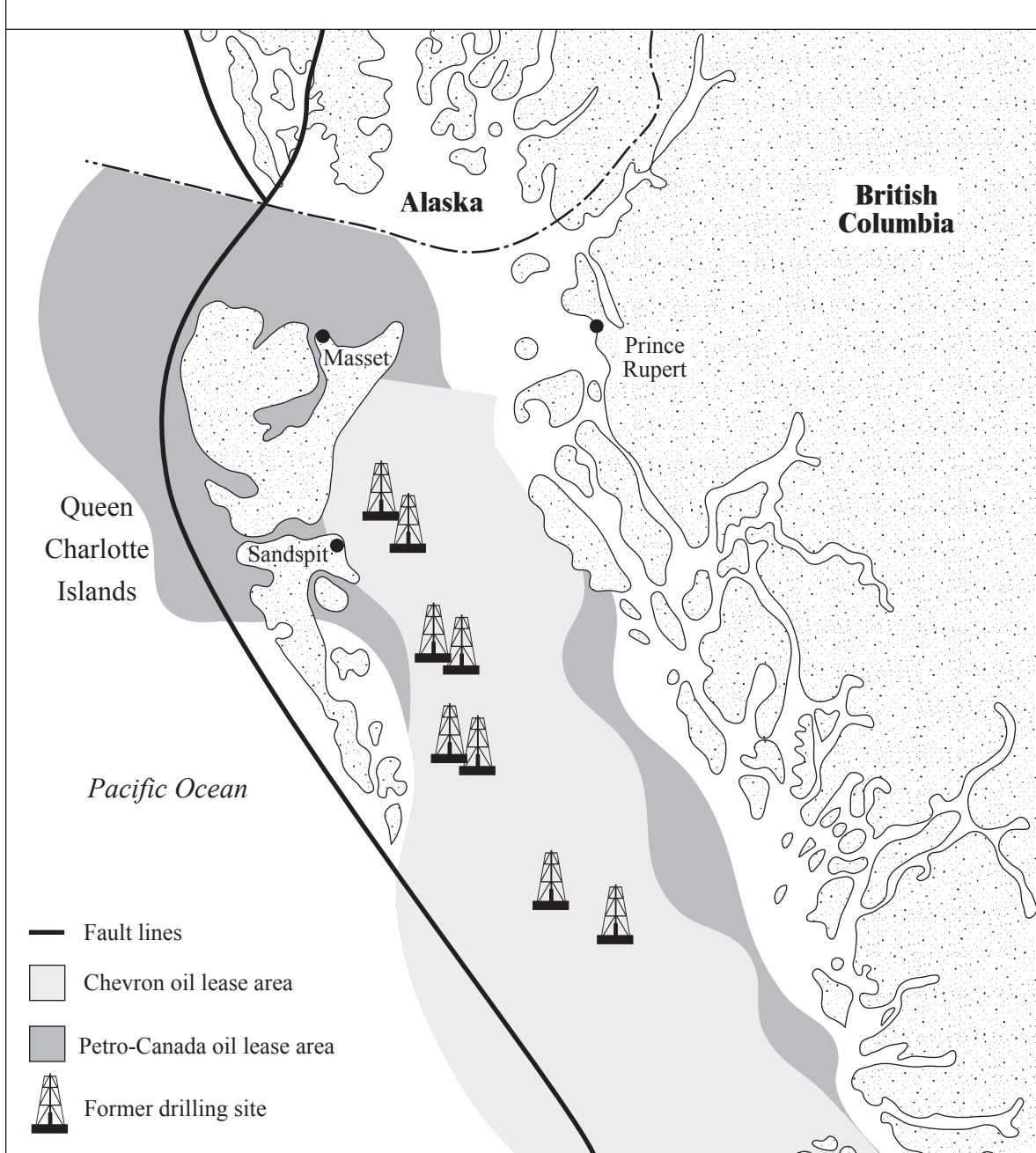
Response:

The effect of warm front precipitation on human activity	<ul style="list-style-type: none">• flooding• soil erosion• clothing choice (slickers)• an increase in car accidents• road closures — mass wastage• facilitates farming and domestic gardening• construction (pouring and curing of concrete)• forestry practice (closures in dry periods and when very wet, muddy logging roads)
The effect of the influence of altitude / elevation on temperature, on human activity	<ul style="list-style-type: none">• growing season / farming activities• recreational activities (lowland versus alpine)• road maintenance (frost shattering and frost heaves)• roof design (“A” frame construction so snow slides off)• vegetation patterns govern the type of economic activity• wearing appropriate clothing for high altitude activities such as hiking, skiing and snow boarding

Use the following information and map to answer question 4.

Oil and Gas of the Queen Charlotte Basin

1998 — the Geological Survey of Canada estimates that the Queen Charlotte Basin may contain recoverable reserves of 2.6 billion barrels of oil, a twenty year supply.



4. The federal and provincial governments have stopped the exploration for oil and gas resources in the Queen Charlotte Basin.

a) Using the data provided, outline **three** arguments why the exploration and development of these resources **should not** take place. **(3 marks)**

Response:

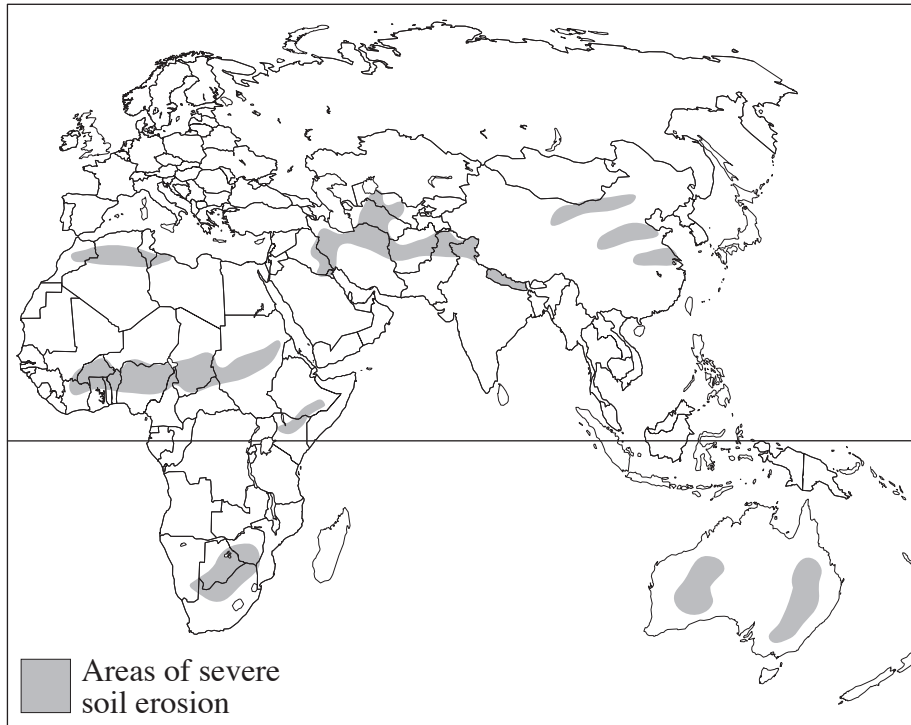
<p>Development should not take place because</p>	<ul style="list-style-type: none"> • of aboriginal claims. • the reserves may be over-exaggerated. • money should be spent on alternative energy sources that are less harmful to the environment. • of potential international conflict with the U.S.A. (Alaska). • of the dangers of earthquake activity from nearby fault zones. • of the need to protect fishing and recreational activities from oil and gas industry accidents (oil spills). • high winds affect drilling and shipping, endangering human life. • of the impact it could have on the marine ecosystems (plankton, kelp forests, fish, birds, seals, whales, etc.) • it would conflict with aesthetic values. • of the risk of spills during transportation of the product. • oil spills can be carried by ocean currents to other places.
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b) Outline **three** arguments why the exploration and development of these resources **should** take place. **(3 marks)**

Response:

<p>Development should take place to</p>	<ul style="list-style-type: none"> • inject foreign capital. • increase tax revenues; conversely, reduce the tax burden on BC taxpayers. • revitalize and diversify the economy of B.C. • create employment (construction of oil rigs). • create employment in the oil and gas industry. • augment dwindling fishing and forest revenues. • compensate oil companies for their leases (investment to date). • decrease the cost of petroleum products to consumers in Canada. • reduce Canada's dependence on foreign, imported oil. • derive information about the fault line.
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Use the following map to answer question 5.



5. a) Suggest **two** reasons why people have ignored good soil management practices in many of the shaded areas of the map. **(2 marks)**

Response:

<p>Sound soil management practices have been ignored because of</p>	<ul style="list-style-type: none">• the difficulty involved in controlling population.• the demand for urban areas which encroach on agricultural areas.• economic demands on the resources associated with the soil (clear-cut forest practices, increased demand for food by growing population, including demand for biomass such as in Africa).• the public demand for cheap agricultural products (use of chemicals and poor agricultural practices that do not take into account long-term effects on the soil).• managers avoiding or ignoring costly solutions to problems (salt accumulation, natural cycle of drought).• government policy, or lack of government policy; an inability to enforce any legislation of policy.• the value of cash crops, which generate foreign currency, which governments use to purchase imported goods.• cultural beliefs and attitudes which contribute to a reluctance to change existing practices.• population growth which can overwhelm existing capacity of arable lands.• overgrazing which leads to soil compaction, destruction of root systems and accelerating desertification.
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b) Describe **two** common ways to reduce soil erosion.

(2 marks)

Response:

Soil erosion can be reduced through	<ul style="list-style-type: none">• using crop rotation techniques.• using ethical business practices.• consumer awareness / purchasing power.• education in soil conservation techniques.• reducing sources of acid rain and other pollutants.• plowing in organic residues and using contour plowing.• government initiatives / policies that foster soil conservation and family planning.• introducing techniques to reduce wind and water erosion (shelterbelts, cover crops and zero tillage).• more developed countries exchanging technology with less developed countries and expanding research into what causes soil erosion and how it can be minimized or reversed.
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6. Explain how human modification of the atmosphere, biosphere and lithosphere may affect salmon **habitat**. **(6 marks)**

Response:

<p>Atmosphere</p>	<ul style="list-style-type: none"> • global warming could alter lake habitats (thermal pollution) • ozone depletion could result in a loss of phytoplankton, thereby reducing and disrupting the food chain • acid rain alters pH balance in lakes and rivers <ul style="list-style-type: none"> – destroys fish habitat – weakens immune system of fish – damages food chain
<p>Biosphere</p>	<ul style="list-style-type: none"> • clearcutting of forests will cause <ul style="list-style-type: none"> – thermal pollution along streams – destruction of cover for fish from their natural predators – increased soil erosion which will lead to siltation and covering of spawning beds – wood debris prevents spawning • urban expansion into wetland areas will reduce habitat • use of fertilizers / pesticides causes genetic change and death (eutrophication)
<p>Lithosphere</p>	<ul style="list-style-type: none"> • mining — acid rock drainage; removal of overburden increases erosion • road construction will increase soil erosion and mass wasting into stream channels • earth-moving machinery causes contamination to soil and water • leaching is accelerated • changed run-off and drainage patterns • destabilization of landforms which could lead to mass wasting, leading to blocked streams, halting migration and spawning

7. Generating 360 kilograms of solid waste per person each year, Canadians are the seventh largest garbage producers in the world.

a) Suggest **two** ways that recycling and reusing products is beneficial to the environment.

(2 marks)

Response:

<p>Benefits</p>	<ul style="list-style-type: none"> • less waste means fewer landfills (reduces leachates and methane gas) • saves energy, reducing our reliance on fossil fuels • saves natural resources so there is less damage to the resource base • recycling paper means fewer trees need to be cut down, reducing habitat loss and soil erosion
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b) Suggest **three** reasons why solid waste reduction is difficult to achieve.

(3 marks)

Response:

<p>Waste reduction goals are difficult to achieve because</p>	<ul style="list-style-type: none"> • landfill is preferred as it is relatively cheap. • we live in a society with a throw-away ethic. • there is a perception that there is lots of space for waste disposal. • there is currently no market for much of the recycled and recyclable material. • there is a lack of government support and funding. • for years, people did not see waste disposal as a problem. • there is a lack of education regarding what can be recycled and the benefits of recycling. • of overpackaging. • we have become dependent on disposable products (throw away society). • of the convenience and low cost of plastics. • of lifestyle, economic wealth and consumerism. • of the lack of understanding of the problem (out of sight, out of mind mentality) • there are strict health regulations concerning packaging. • of the expense of recycling programs.
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Use the following cartoon to answer question 8.



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

(1 mark)

Response:

<p>The intent of the cartoonist's message</p>	<ul style="list-style-type: none">• Not everyone believes in the threat of global warming since its impacts tend to be changes to climate (which are very slow), and they do not see the impacts where they live.
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b) Describe **two** effects global warming may have on Canada.

(2 marks)

Response:

Effects	<ul style="list-style-type: none">• coastal flooding• increased drought• increase in forest fires• increased wind erosion• shortage of irrigation water• reduced home heating costs• shifting of agricultural areas• increased numbers of icebergs• changes in fish migration patterns• losses of hydro-electric power and shipping• increased precipitation in drier areas• tropical pests and diseases moving northward into Canada• increased precipitation in mountainous areas could result in the advance of glaciers
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c) Suggest **two** reasons why international cooperation on issues such as global warming is difficult to achieve.

(2 marks)

Response:

Difficulty	<ul style="list-style-type: none">• shifting government priorities and limited financial resources• insufficient technology transfer• power of multinational companies• government's role is minimal or non-existent• developing countries cannot afford alternatives• developing countries believe in their right to develop industrially at any cost so that they too can enjoy a higher standard of living
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Use the case study of Iceland on pages 34 and 35 to answer question 9.

9. Using evidence from the data provided and your understanding of geography, explain how the physical environment influences the people of Iceland. Suggest how the people of Iceland will sustain their economic growth. Answer in **multi-paragraph** form. (10 marks)

Response:

Physical Environment	<p>Location</p> <ul style="list-style-type: none">• on the edge of the Arctic Circle — results in a cold climate• northerly latitude influences the angle at which the sun's rays hit Iceland (less concentration)• long hours of sunlight during the summer months• located along the polar front — results in northern Iceland experiencing the effects of the polar easterlies while southern Iceland experiences the effects of the westerlies• coastal area of southern Iceland is warmed by the Gulf Stream, while northern Iceland is influenced by the cold Greenland Current <p>Land Formation</p> <ul style="list-style-type: none">• on top of the Mid-Atlantic Ridge• area of plate separation, which results in the formation of a rift valley through the middle of Iceland• hot spots or magma plumes in this region have resulted in the formation of shield volcanoes and basaltic lava flows• dominated by volcanoes (over 200) and glaciers, which cover $\frac{1}{8}$ of Iceland• Iceland is of recent volcanic origin• one of the most active volcanic regions on the planet• seeping of groundwater into the numerous faults has resulted in Iceland having numerous hot springs
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<p>People Adaptations</p>	<p>Agriculture</p> <ul style="list-style-type: none"> • northerly latitude discourages agriculture • chief crop is hay, which is used to feed sheep and cattle • three crops of hay can be harvested during the period of midnight sun • vegetables are grown in geothermally heated greenhouses • 20% of the land is used for grazing • less than 1% of the land is cultivated due to the recent volcanic origin of much of the soil <p>Export of Fish</p> <ul style="list-style-type: none"> • availability of fish due to location in the ocean • proximity to fish-rich continental shelves as well as to areas where cold and warm ocean currents meet (upwelling creates nutrient rich waters) <p>Power and Power Development</p> <ul style="list-style-type: none"> • well-insulated homes • few mineral resources, but abundant rivers and volcanic activity result in massive hydro-electric and geothermal projects • 80% of Iceland depends on geothermal heating <p>Living with Volcanism</p> <ul style="list-style-type: none"> • monitor active volcanoes and earthquake zones • develop evacuation plans • construct channels for mud and lava flows • construct seismic event shelters • people will build away from active areas
<p>Iceland's economic growth can be sustained through</p>	<ul style="list-style-type: none"> • the sale of energy to neighbouring European countries (Great Britain — Scotland). • the expansion of energy production (geothermal and hydro-electric). • fish stock management (quotas and treaties). • the expansion of agro-business via greenhouse production. • future research and development (tectonic forces, geothermal). • the expansion of the tourism industry (hot springs). • finding solutions to transportation issues. • small population needs to ensure high levels of education to secure Iceland's economic future.

END OF KEY