PART I

Instructions: Shade the letter of the correct answer on the machine scorable answer sheet provided.

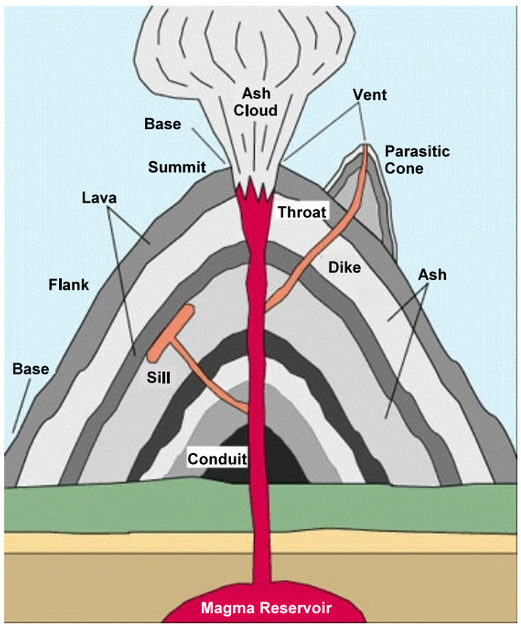
SECTION A **TOTAL VALUE: 42%**

Instructions: Do ALL of the Questions in Part I, Section A.

1. Which refers to an anticline?

(A) downfolds of folding crust
(B) trough of folding crust
(C) upfolds of folding crust
(D) valley of folding crust

2. What type of volcano is illustrated in the diagram below?

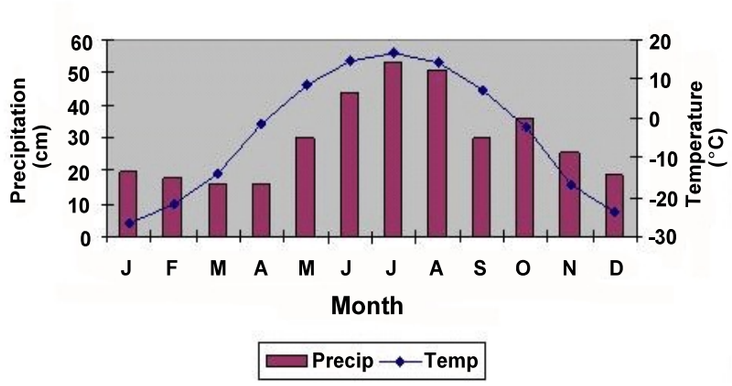


(A) ash and cinder
(B) composite
(C) hot spot
(D) shield

3. Which weathering process is illustrated below?

(A) frost fracture
(B) hydrolsis
(C) oxidation
(D) plant action

4. Which form of physical weathering is most dominant in the region represented below?



(A) exfoliation
(B) frost fracture
(C) hydrolysis
(D) plant action

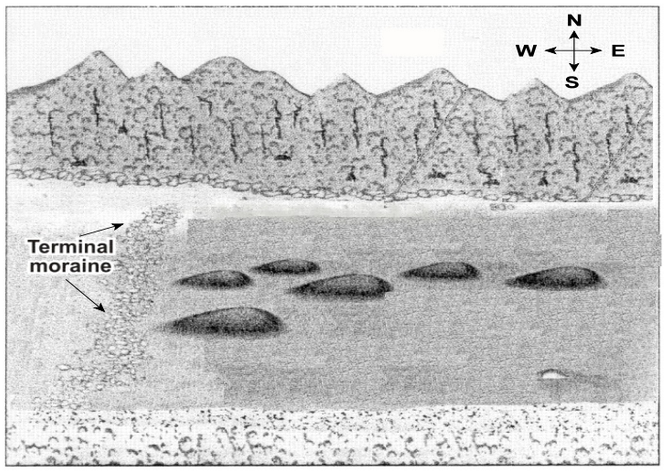
5. Which describes a digitate delta?

(A) bow shaped depositional feature
(B) feature fan shaped depositional feature
(C) long finger like sediment formation
(D) sediment feature resulting from sea tides

6. Which feature results from streams and rivers beneath a glacier?

(A) drumlin
(B) erratic
(C) esker
(D) fiord

7. According to the diagram below, in which direction did the glacier move?



(A) east to west
(B) north to south
(C) south to north
(D) west to east

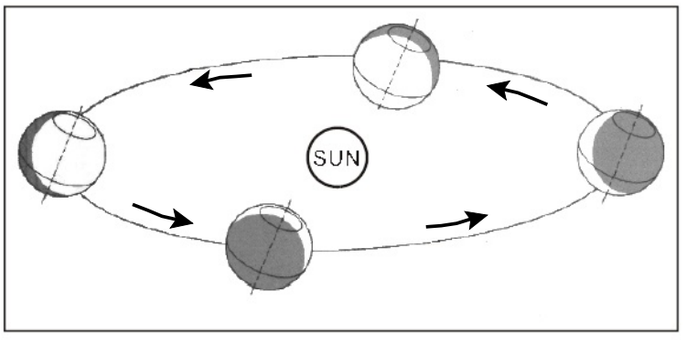
8. Which refers to a sharp ridge separating cirques in a mountain range?

(A) aréte
(B) drumlin
(C) hanging valley
(D) terminal moraine

9. Which land form feature would you expect to form next in the coastal environment shown below?

(A) sea arch
(B) sea cave
(C) spit
(D) stack

10. What concept is best illustrated below?



(A) coriolis effect
(B) global warming
(C) revolution
(D) rotation

11. What is the effect of a clear, cloudless sky on Earth?

(A) day and night temperatures are cooler
(B) day and night temperatures are warmer
(C) nights are cooler and days are warmer
(D) nights are warmer and days are cooler

12. Which factor is most responsible for differences in temperature at X and Y below?

(A) altitude
(B) latitude
(C) ocean currents
(D) prevailing winds

13. Which refers to the most common wind direction at a given location?

(A) monsoon winds
(B) prevailing winds
(C) trade winds
(D) westerly winds

14. Which statement is true regarding the development of sea breezes?

(A) high pressure developing over land
(B) land heating up much faster than ocean
(C) low pressure developing over ocean
(D) ocean heating up much faster than land

15. What describes how the rotation of Earth causes freely moving water and air masses to be deflected from their original courses?

(A) coriolis effect
(B) high pressure
(C) pressure zones
(D) trade winds

16. What is the horizontal movement of unusually warm or cold surface water?

(A) convection cell
(B) cyclone
(C) ocean current
(D) typhoon

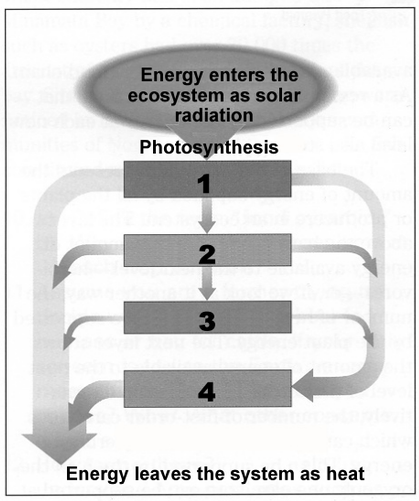
17. What is the difference between the highest and lowest temperature of a region?

(A) average temperature
(B) greenhouse effect
(C) pressure belts
(D) temperature range

18. What is the most common type of precipitation experienced at location X in the diagram below?

(A) convectional
(B) cyclonic
(C) frontal
(D) orographic

19. According to the diagram below, which number would represent producers?

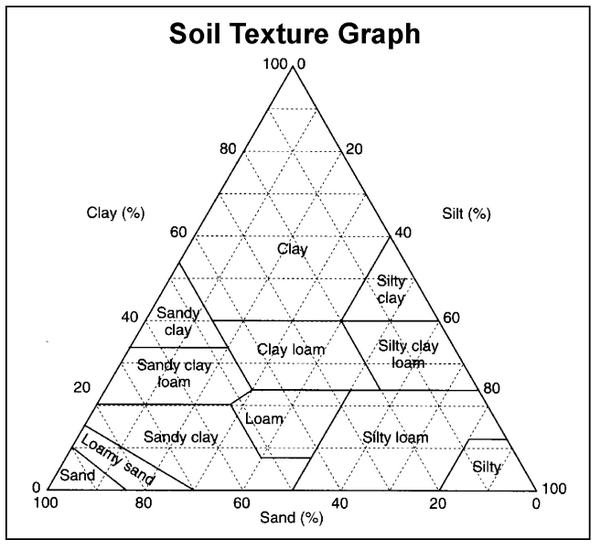


(A) 1
(B) 2
(C) 3
(D) 4

20. Which is an example of biological amplification?

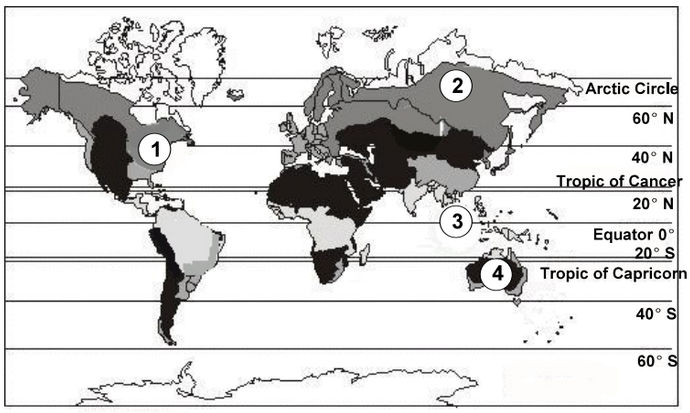
(A) hawks dying from eating prey exposed to insecticides
(B) lake trout dying from exposure to a chemical spill
(C) sea birds dying from exposure to an oil spill
(D) trees dying from exposure to acid rain

21. According to graphic below, which would be the most favourable soil for farming?



(A) 10% sand, 40% clay, 50% silt
(B) 20% sand, 60% clay, 20% silt
(C) 30% sand, 30% clay, 40% silt
(D) 50% sand, 40% clay, 10% silt

22. According to the map below, which region would be most at risk due to the removal of the rain forest?



(A) 1
(B) 2
(C) 3
(D) 4

23. Which combination determines if a natural material is actually a resource?

(A) inputs, culture, outputs
(B) need, process, inputs
(C) process, culture, outputs
(D) technology, profit, need

24. Which would be a natural input in a fish farming operation?

(A) capital investment
(B) holding cages
(C) labour to maintain farm
(D) young fish from oceans

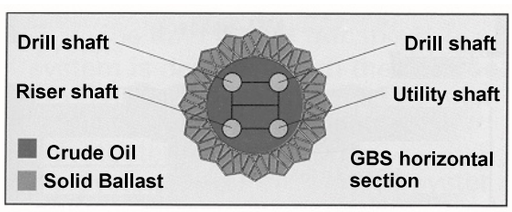
25. What is the last stage in determining the location of oil and gas reserves?

(A) analyzing seismic data
(B) directing sound waves at ocean bottoms
(C) drilling wildcat wells
(D) recording sound waves using hydrophones

26. What type of oil rig would be best suited to extract oil in extremely deep water and heavy seas?

(A) jack-up
(B) semi-submersible anchored
(C) semi-submersible dynamically positioned
(D) submersible

27. Why would drill platforms in the North Atlantic have jagged concrete teeth at sea level?

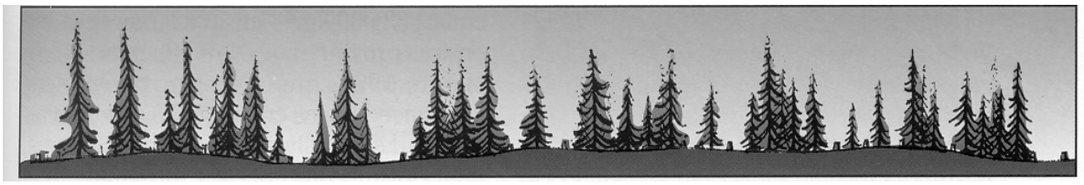


(A) easier to move
(B) endure heavy waves
(C) store oil reserves
(D) withstand iceberg collisions

28. Which type of technology would be used to extract oil from smaller dispersed oil deposits offshore?

(A) directional drilling
(B) ice-strengthened shuttle tankers
(C) seismic surveys
(D) three-dimensional imaging

29. Which harvesting method is best illustrated below?



(A) clear cutting
(B) selective cutting
(C) shifting cultivation
(D) slash and burn

30. Which best explains why clear cutting is the preferred method of tree harvesting by commercial harvesters?

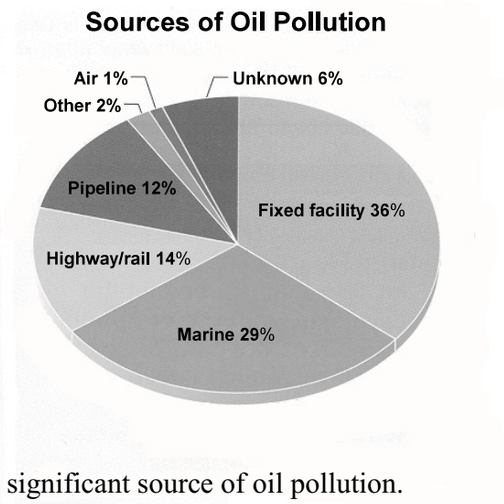
(A) only dead and unusable timber is removed
(B) it is economical and the least dangerous method
(C) the forest floor is cleared completely
(D) logging roads do not have to be maintained

31. According to the chart below, which oil producing area experienced the greatest growth rate between 1990 and 2000?

Region	**Percentage of Total Offshore Oil Production**		
	1990	**1995**	**2000**
North America	2.792	3.364	4.94
North Sea	3.767	5.855	7.52
South America	0.538	0.66	1.45
West Africa	0.873	1.098	1.57

(A) North America
(B) North Sea
(C) South America
(D) West Africa

32. Which statement best summarizes the information in the pie chart?



(A) Air is a significant source of oil pollution.
(B) Highway/rail oil spills account for almost 1/4 of oil pollution worldwide.
(C) Marine oil spills account for more pollution than pipeline and rail/highway.
(D) Unknown sources account for the smallest amount of oil pollution.

33. Which is a human input in a fish processing plant?

(A) capital
(B) climate
(C) fish
(D) fresh water

34. Which represents a conditioning process?

(A) aerospace industry
(B) clothing manufacturing
(C) fish processing plant
(D) information technology industry

35. Which is the best example of a labour-intensive manufacturing industry?

(A) airplane
(B) automobile
(C) clothing
(D) steel

36. Which would be produced by a heavy industry?

(A) cement
(B) hockey sticks
(C) oil platforms
(D) work boots

37. Which best describes a market-oriented industry?

(A) found close to consumers
(B) located close to resource
(C) manufacturing reduces weight
(D) weight-loss increases value

38. Which best describes the advantage of agglomerating tendency?

(A) close to labour force
(B) close to related businesses
(C) next to the market
(D) next to the resource

39. Which best defines tertiary activity?

(A) extraction of new materials from the natural environment
(B) manufacturing of raw materials into useable products
(C) production of services for individuals, industries and government
(D) use of high technology to provide services

40. Which is an activity that uses high levels of technology to produce, store, retrieve and distribute information?

(A) primary
(B) quaternary
(C) quinary
(D) secondary

41. What is the total value of a nation's goods and services in a given year?

(A) economic indicator
(B) gross national product
(C) human development index
(D) standard of living

42. According to the table below, which set of characteristics would represent a county with the lowest level of economic development?

	Percentage Employed by Sector		
	Primary	Secondary	Tertiary
(A)	69.6	21.0	9.0
(B)	48.0	29.0	23.0
(C)	12.0	25.5	62.5
(D)	9.9	15.1	75.0

SECTION B **TOTAL VALUE: 8%**

Do only ONE of the Units in Section B.

Either: Unit 6 - Population Distribution and Growth
Or: Unit 7 - Settlement and Urbanization

UNIT 6 - Population Distribution and Growth

43. Which is described below?

- unsanitary living conditions
- spread of disease
- loss of bio-diversity
- political and civil conflict

(A) contracting population
(B) natural decrease
(C) overpopulation
(D) pull factors

44. Which refers to the population dynamic of deaths exceeding births?

(A) actual change
(B) dependency ratio
(C) natural decrease
(D) overpopulation

45. Which population dynamic is illustrated below?

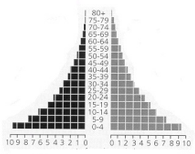
Births = 7483 Deaths = 6374

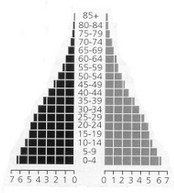
(A) actual change
(B) contracting population
(C) dependency ratio
(D) natural increase

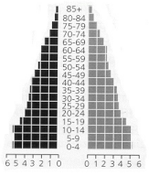
46. Which factor contributes most to a greying population ?

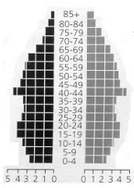
(A) better health care
(B) improved transportation
(C) increased birth rate
(D) poor nutrition

47. Which is representative of a contracting population?

(A) 

(B) 

(C) 

(D) 

48. What is the movement of people out of a country or region?

(A) actual change
(B) emigration
(C) immigration
(D) natural change

49. Which refers to the factors that draw individuals to a given location?

(A) intervening
(B) pull
(C) push
(D) repel

50. Which best illustrates the benefits of using census data ?

(A) create new habitats and opportunities for wildlife
(B) identify trends to help plan for the future
(C) inform citizens about government spending
(D) prevent loss of natural resources

Unit 7 - Settlement and Urbanization

Note: If you are completing this unit, please ensure you shade bubbles for 51-58

51. Which settlement is characterized by few buildings scattered over a large area?

(A) composite
(B) linear
(C) loose knit
(D) straight line

52. Which refers to the distinct features or qualities of a specific location?

(A) gentrification
(B) site
(C) situation
(D) urbanization

53. Which factor is most closely associated with the location of the port city below?

(A) acropolis
(B) confluence
(C) river meander
(D) sheltered harbour

54. Which is a situation factor that influences the population growth of a city?

(A) head of navigation
(B) river island
(C) service centre
(D) sheltered harbour

55. Which refers to the migration of rural populations into towns and cities?

(A) density
(B) distribution
(C) topography
(D) urbanization

56. Which shows a primate city arrangement?

	Largest City (Pop. in millions)	2nd largest city (Pop. in millions)	3rd largest city (Pop. In millions)	4th Largest City (Pop. in millions)
(A)	6.8	3.3	2.2	1.8
(B)	6.3	1.5	0.8	0.7
(C)	4.6	2.8	1.4	1.1
(D)	3.1	1.4	0.9	0.7

57. If a country exhibits primacy in the size of its cities, what are its characteristics?

(A) highly rural, abundant cultural and economic resources in all regions
(B) highly rural, lacking cultural and economic resources except in the primate city
(C) highly urbanized, abundant cultural and economic resources in all regions
(D) highly urbanized, lacking cultural and economic resources in the primate city

58. Which would be considered a high-order good?

(A) bedroom furniture
(B) refrigerator
(C) specialty automobile
(D) vegetables

PART II

SECTION A **TOTAL VALUE: 8%**

Instructions: Do ALL questions in PART II, Section A.

Value
4% 59. With the aid of a labeled diagram, explain how compressional and tensional forces are caused.

Diagram

Value
4% 60. Explain two strategies employed in the forestry industry to ensure sustainable development.

SECTION B **TOTAL VALUE: 4%**

Do only ONE of the Units in Section B.

Either: Unit 6 - Population Distribution and Growth
Or: Unit 7 - Settlement and Urbanization

UNIT 6 - Population Distribution and Growth

Value
4% 61. To try and reduce its increasing population growth rate, a developing country has decided that couples who have more than one child will have to pay more taxes than those who only have one child. Evaluate this policy giving two reasons for your position.

UNIT 7 - Settlement and Urbanization

Value
4% 62. Explain two factors that contribute to the selection of a site for settlement.

Part II

Section C **TOTAL VALUE: 28%**

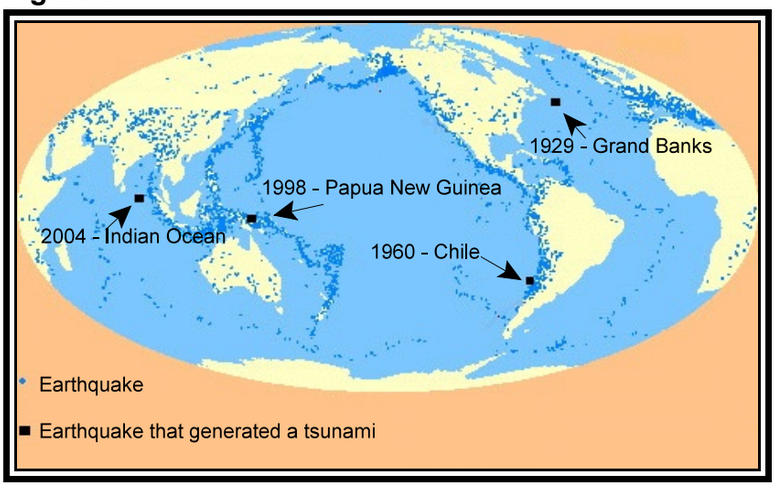
Instructions: Do ALL questions in PART II, Section C.

CASE STUDY 1
Units 1-5

Tsunami

A tsunami is a wave train, or series of waves, generated in a body of water by a disturbance that vertically displaces the water column. Earthquakes, landslides, volcanic eruptions, explosions, and even the impact of cosmic bodies, such as meteorites, can generate tsunamis. Tsunamis can savagely attack coastlines, causing devastating property damage, loss of life, and environmental destruction.

Figure 1

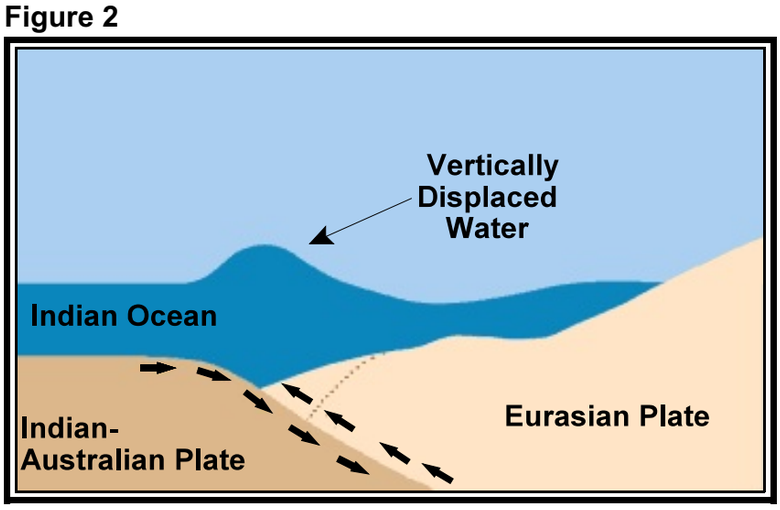


Tsunamis do not have a season and do not occur regularly or frequently. Yet they pose a major threat to the coastal populations of the Pacific. Nothing can be done to prevent them, but the adverse impact on the loss of life and property can be reduced with proper planning.

The undersea Indian Ocean earthquake that occurred on December 26, 2004, produced tsunamis that were among the deadliest natural disasters in modern history. The tsunamis devastated the shores of Indonesia, Sri Lanka, India, Thailand, and other countries with waves of up to 15 m high, even reaching Somalia on the east coast of Africa, 4 500 km west of the epicenter (point of origin). Over 225 000 people are known to have died as a result of the tsunami.

In the United States, the National Oceanic and Atmospheric Administration (NOAA) oversees the Tsunami Program, with its mission to provide a 24-hour detection and warning system and increase public awareness about the threat of tsunami. It provides warning bulletins to government authorities and the public. The Tsunami Ready Community program was created by the NOAA Weather Service to help communities become prepared for tsunamis through better planning, education and awareness. The program is voluntary and communities must meet certain criteria to receive the designation. The countries impacted by the 2004 Tsunami did not have access to any of these programs.

Figure 2



General Information about Tsunamis

During a tsunami, waves radiate outward in all directions from the disturbance and can spread across entire ocean basins. For example, in 1960 an earthquake in Chile caused a tsunami that swept across the Pacific to Japan. Tsunami waves are distinguished from ordinary ocean waves by their great length between peaks, often exceeding 100 miles in the deep ocean, and by the long amount of time between these peaks, ranging from five minutes to an hour. The speed at which tsunamis travel depends on the ocean depth. A tsunami can exceed 800 km per hour in the deep ocean but slows to 50 km per hour in the shallow water near land. In less than 24 hours, a tsunami can cross the entire Pacific Ocean.

In the deep ocean, a tsunami is barely noticeable and will only cause a small and slow rising and falling of the sea surface as it passes. Only as it approaches land does a tsunami become a hazard. As the tsunami approaches land and shallow water, the waves slow down and become compressed, causing them to grow in height. In the best of cases, the tsunami comes onshore like a quickly rising tide and causes a gentle flooding of low-lying coastal areas.

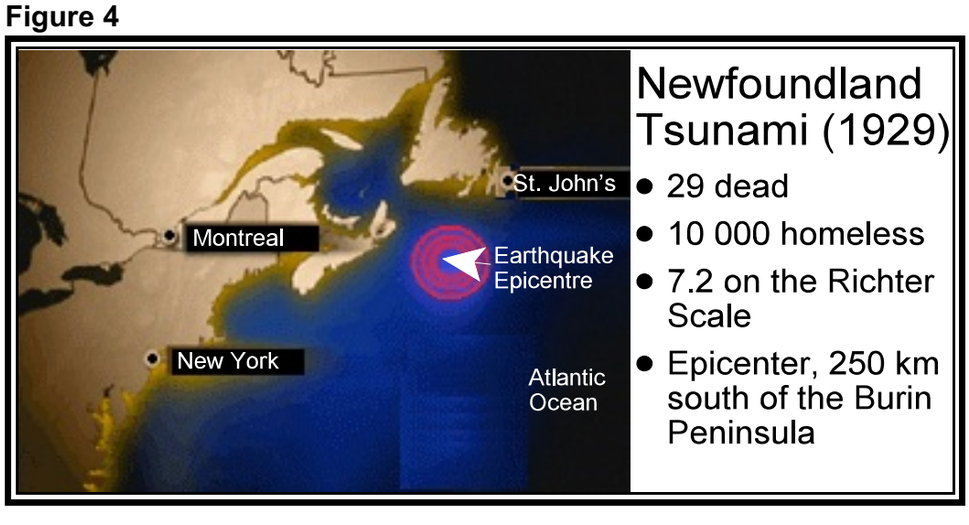
In the worst of cases, a bore will form. A bore is a wall of turbulent water that can be several meters high and can rush onshore with great destructive power. Behind the bore is a deep and fast-moving flood that can pick up and sweep away almost anything in its path, such as what happened in Papua New Guinea in 1998 when more than 2 000 people were killed and villages destroyed. Minutes later, the water will drain away as the trough of the tsunami wave arrives, sometimes exposing great patches of the sea floor. But then the water will rush in again as before, causing additional damage.

Figure 3

This destructive cycle may repeat many times before the hazard finally passes. Persons caught in the path of a tsunami have little chance to survive. They can be easily crushed by debris or they may simply drown. Children and the elderly are particularly at risk, as they have less mobility, strength and endurance.

Tsunamis typically cause the most severe damage and casualties very near their source. There the waves are highest because they have not yet lost much energy to friction or spreading. In addition, the nearby coastal population, often disoriented from the violent earthquake shaking, has little time to react before the tsunami arrives. The largest tsunamis, however, can cause destruction and casualties over a wide area, sometimes as wide as the entire Pacific Basin. These types of Pacific-wide tsunamis may happen only a few times each century.

Figure 4



Value
4% 63. Using Figure 2, explain how tectonic forces create a tsunami.

Value
4% 64. Describe two impacts tsunamis have on ecosystems.

Value

6% 65. Identify and explain three ways that a coastal Newfoundland community may reduce the potential impact of a tsunami.

CASE STUDY 2
Units 1-5

Case Study: Mexico and its Capital City

TO BREATHE OR NOT TO BREATHE?

Mexico City's air has gone from among the world's cleanest to among the dirtiest in the span of a generation. Novelist Carlos Fuentes' first novel was set here in 1959 and was entitled "Where the Air is Clear" -- a title he has said is ironic considering the city's now-soupy environment.

Situated in a valley surrounded by mountains that prevent winds from clearing the air and with 105 721 tons of contaminants per day from 4623 factories, 48% of its residents suffer some chronic air pollution symptoms.
Average visibility of some 11 kilometres in the 1940's is down to about 1.6 kilometres. Snow-capped volcanoes that were once part of the landscape are now visible only rarely, and levels of almost any pollutant like nitrogen dioxide now regularly exceed international standards by two to three times.
Levels of ozone, a pollutant that protects us from solar radiation in the upper atmosphere but is dangerous to breathe, vastly exceed the maximum allowable daily limit. And this occurs several hours per day every day. "Mexico City's air pollution is a criminal act against the city's population," says Humberto Bravo, a scientist at the National Autonomous University who has studied air pollution.
The city is in part a victim of its geography, sitting at the bottom of a bowl-shaped valley that prevents wind from sweeping away fumes from 3.5 million cars and its thousands of factories. Mexico City is also about 2240 metres above sea level. The lower atmospheric oxygen levels at this altitude cause incomplete fuel combustion in engines and higher emissions of carbon monoxide and other compounds. Intense sunlight turns these into higher than normal smog levels.
Thirty percent of the cars are at least 20 years old and many still use leaded gasoline. Outdated diesel buses service the cities' citizens. The state-run oil monopoly, Pemex, could reformulate its fuel to meet California's strict emissions standards but has shied away from the project due to the price tag: $4.9 billion. That may sound like a lot, but how many billions will it save in future health care costs? Many say that there is a lack of leadership by the authorities and that public officials simply sit on their hands and hope nothing too bad will happen on their watch.

The air also contains dried fecal matter from millions of gallons of sewage dumped near the city in open-air areas and from some 3 million stray dogs. Mexico City is one of the few places in the world where you can inhale a gastrointestinal disease like hepatitis or dysentery.

The Mexican government is finally beginning to recognize the severity of its air pollution problem and is in the process of developing innovative solutions to address it. Whether they will be successful remains to be seen.

GDP - composition by sector (2004 est.)

Primary:	4%
Secondary:	26.4%
Tertiary:	69.6%

Mexico City Facts	
Contains 45% of industry in Mexico	60% or residents are born in the city, 40% have migrated there
Population of Mexico City metropolitan area: 18.7 million (2000 est.)	An estimated 50% live as squatters in illegal dwellings
20% of the Mexican population lives there	An estimated population of 30 million by the year 2020
Industrialization from the 1950's to the 1970's relied on rural to urban migration.	Between 19.7 and 20 million people living in the metropolitan area of Mexico City
Contributes about 48% of Mexico's gross domestic product (G.D.P.)	Only 75% of garbage is buried in approved landfill areas

Beneath the cloud cover, Mexico City is enveloped in a blanket of smog. Above the clouds, where the air is clear, the mountains that surround Mexico City can be seen in the background.

Value

4% 66. Explain two ways activities in Mexico City have caused local environmental problems?

Value

4% 67. In response to air quality issues in Mexico city, a local environmental group is lobbying government to close 1200 of its 4600 factories due to poor environmental track records. Provide an argument for and against such a request.

Value

6% 68. What are three actions you could take to achieve improved air quality in Mexico City.

SECTION D **TOTAL VALUE: 10%**

Do only ONE of the Units in Section D. Note: Both units use Case Study 3 below.

Either: Unit 6 - Population Distribution and Growth
Or: Unit 7 - Settlement and Urbanization

CASE STUDY 3

Urbanization: A Global Trend

Since the dawn of civilization, most humans have lived in a rural setting. The city, as we know it, is a relativity recent human phenomenon existing for perhaps 8000 to 9000 years. Yet we don't have to go back that far in time to see that cities were not a dominant feature of the human landscape. In the year 1800, the population of the world was 97% rural.

In the past two hundred years we have seen massive global population shifts. Today, approximately 50% of the world's population live in urban areas. According to *Population Reports* in the fall of 2002, urban areas will gain one million new residents every week. The result of this, according to the United Nations, is that by the year 2015 the world will have 21 "mega-cities"- cities of at least 10 million people. At this time it is projected that 3.2 billion people will live in our cities, more than the entire global population of 1967.

Urban populations grow in one of three ways. First, through migration to cities by new residents; second by natural increases due to increased birth rates; and third by the administrative redefinition of areas that were previously considered rural. Of course with better health care available in cities, mortality rates will also decrease as people live longer and thus allow for an even greater growth rate for our cities.

Yet why did urbanization occur in the first place? Factors include declining death rates, more rational management of agriculture, improved transportation and communication systems, stable political governments, and, of course, the industrial revolution. As a result, the trend for humans to gather together in large cities was inevitable. Simply stated, humans now have the capacity to develop the necessary infrastructure to live together in large cities.

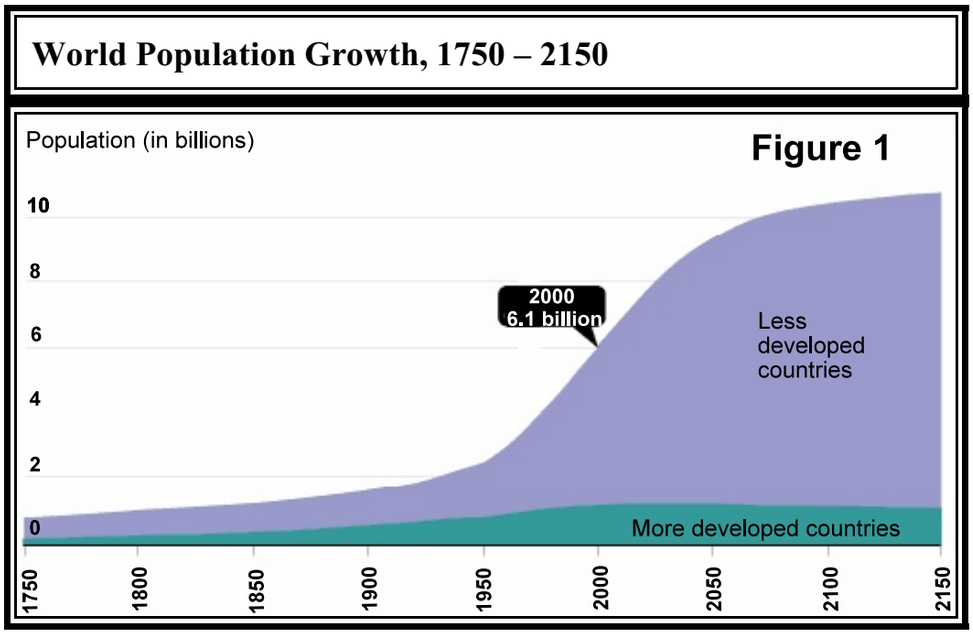
There are regional differences, however, as the rate of urbanization has historically been far greater for developed countries than for developing. Yet, this feature of world urbanization is changing. According to the United Nations, the urban population of developing countries will experience greater population growth than that of developed countries in the future. Given that developing countries have far fewer resources to prepare and accommodate for such population shifts, urbanization will probably lead to increasing health problems, chronically poor living conditions, and an inadequate infrastructure to provide for the needs of their growing urban populations.

The Urban Challenge

While urban areas have turned into powerhouses of economic growth in our global economy, there are concerns. Government have to balance the desire for economic growth with the quality of life needs of its citizens. When cities face rapid growth that urban planners are unable to keep up with, many problems result, such as: rising poverty levels, inadequate public services, problems with infrastructure development, shortages in housing, and lack of services and opportunities.

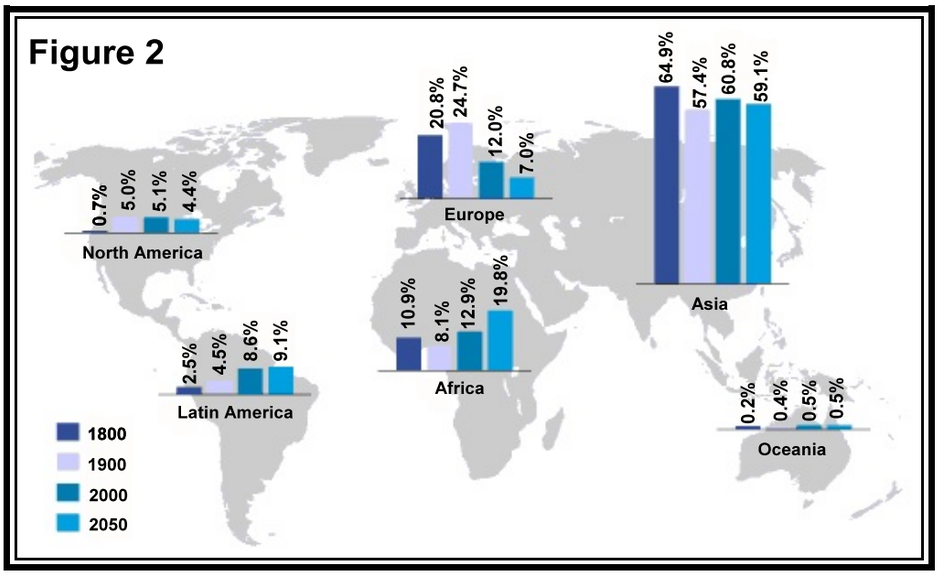
The problem of urban poverty is a major concern for city planners. The average city today has 30% of its population that would be considered to be living in poverty. The United Nations suggest that the worst is yet to come when by 2035, about 50% of our urban dwellers will be living in poverty. Most of these individuals will live in slums, with inadequate housing, poor drinking water, sanitation and health care services. These conditions often lead to many diseases, some chronic causing widespread concern for all urban dwellers.

The trend of urban development is outward and upward, placing demands upon the natural environment. These demands can lead to stress upon the natural environment resulting in the collapse of the local ecosystems.



Source: United Nations, *World Population Prospects, The 1998 Revision*; and estimates by the Population Reference Bureau

World Population Distribution by region, 1800 – 2050



Source: United Nations Population Division, *Briefing Packet, 1998 Revision of World Population Prospects.*

SECTION D **TOTAL VALUE: 10%**

Do only ONE of the Units in Section D.

Either: Unit 6 - Population Distribution and Growth
Or: Unit 7 - Settlement and Urbanization

Unit 6 - Population Distribution and Growth

Value
4% 69. With reference to the case study, explain one push and one pull factor that contributes to the global trend of urbanization.

Value
6% 70. Explain three reasons for controlling populations.

Unit 7 - Settlement and Urbanization

Value

4% 71. Despite the negative quality of life indicators described in the case study, individuals continue to contribute to the process of urbanization worldwide. Use two examples to explain why this is so.

Value

6% 72. Growing urban centres face many challenges when it comes to rapid population growth. Explain three strategies that could be used to improve the quality of life in a city with urban problems.