

How are the Earth's resources, environment and human population interconnected?	-people use the resources for energy and raw materials to sustain life and create wealth
What is the biosphere ?	Zone of earth, water and air in which we live
What has been the effect of increasing population on the environment?	-harmful changes in the biosphere -depleting resources (soil, water, forests, mineral and energy)
How many people are added each year to the world population?	80 million
Why is the impact of the pop increase not as great as it could be?	- much of the increase in population is in the developing world and they don't consume much of the world's resources
What percent of the world resources is consumed by the developed world?	85% of the resources are consumed by 20% of the world pop. (developed world)
What is sustainability?	Maintaining economic growth without damaging the environment so much that life is compromised
How did scientists from around the world show their concern about this issue?	1700 scientists Signed the World Scientist's Warning to Humanity in 1992
What recommendations did the UN Commission report "Our Common Future" make in 1987?	-asked developed world : 1. to reduce resource consumption and develop a sustainable lifestyle 2. better management of renewable and non-renewable resources -asked developing world: 1. to reduce population growth to allow for development that would not overwhelm the environment
What was significant about the 1992 Earth Summit in Rio de Janeiro?	-largest gathering of heads on state in human history -produced "Agenda 21" to encourage the development of a sustainable world economy. -a decade later there has been little progress in action taken to change

What is the percentage of water in the world that is fresh?	3 % fresh and 97 % salty
Where is most of the fresh water found?	78 % of the fresh water is in ice caps or glaciers, the rest is underground as groundwater
What are the problems associated with the world's water?	-uneven distribution (Canada has a great share of the world fresh water: Great Lakes supply 18%) -many nations (mostly developed world) waste or pollute water resources
What is the main threat to the world's freshwater supply?	Increasing population
What are the main causes of water shortages?	-Falling groundwater tables -diversion of surface supplies (Ganges River, India, Nile River, Africa Colorado River, US all have little water left when they reach the sea)
What is the effect of the water shortages?	-world agricultural production threatened: 40 % of the world's harvest come from irrigated croplands -US, China and India produce ½ of the world food and are all facing reduced groundwater
How was the amount of irrigated land able to double to over 250 million hectares in the latter ½ of the 20 th century?	-using new technologies and techniques in well-drilling farmers were able to tap the groundwater in aquifers beneath their land
What is an aquifer?	An underground layer of rock that allows water to flow through it. (The water may be stopped by a layer of impermeable rock and then the aquifer stores the water)
What are the benefits of using aquifers?	-constant supply -can be pumped when needed -not subject to evaporation
What are the major problems associated with aquifers?	-aquifers do not quickly refill when depleted -then forced to drill deeper to access water -deeper water tap into arsenic, fluoride and other minerals which are dangerous to health

What areas are facing the consequences of years of over-pumping groundwater?	China: water table falling 1.5 m/ year India : water table falling 1-3 m/year and the US
How have surface waters been abused?	-lakes rivers and oceans have been used for disposal of sewage and agricultural and industrial wastes
Municipal wastes contain what hazards?	Human effluent, detergents, solvents
What effect of pollution has been noted in Arctic wildlife?	-whales and polar bears have mercury in their systems
What regions in Canada pollute water and by what method?	-Victoria and Halifax dump untreated sewage into ocean -Fraser river polluted by pulp mills (50% from interior and 90% of municipal waste from Fraser Valley and Vancouver)
How are lakes near populated areas effected?	-agricultural and industrial chemicals and wastes promote the growth of algae and weeds that deplete the lakes' oxygen (ie milfoil weed in Okanagan)
What are the arguments for the exportation of Canada's water?	-creates revenues and employment
What are the arguments against?	-under terms of NAFTA , if any bulk water is exported then Canada would lose control of its water -it is cheaper to turn salt water into fresh with using desalination plants -conservation schemes like low flush toilets and drip irrigation make more economic sense than paying for imports
What solutions are there to the water management problems?	-conservation-using efficient small scale supply systems
What present technologies show promise?	Micro-dams (instead of large scale dams), hydro systems that follow a river's natural flow, low energy sprinkler systems and drip irrigation and more efficient rainwater harvesting

What is the ozone layer?	Thin layer of ozone in the atmosphere which blocks the ultraviolet (UV rays of the sun
What are the negative effects of UV radiation?	Can damage animal and plant species (even 20 meters below ocean) -cause skin cancer
Where is the ozone depletion most apparent?	At the northern and southern poles -60 % missing over Antarctica
What chemicals have destroyed 80% of the ozone layer?	-CFC's (chlorofluorocarbons) used as coolants in refrigerators and air conditioners, foams, solvents and aerosol sprays
What was the Montreal Protocol?	Agreement in 1987 by all industrial nations to cut use of CFC's -allowed for use of CFC's until 2000
What is the problem with CFC substitutes?	-they are expensive
What will halt the damage to the ozone layer?	-complete elimination of CFC's (amount released is increasing) -recapture of CFC's in use
How long would it take for the atmosphere to return to 1980's conditions?	-a century
What are the greenhouse gases that contribute to global warming?	-carbon dioxide (50%), CFC's (20%), Methane, (16%), Ozone, Nitrous Oxide
How does greenhouse effect work?	1. Solar radiation absorbed by earth 2. Earth's surface radiates heat (infrared radiation) back into atmosphere 3. 30% of Infrared radiation escapes back into space 4. Heat trapped by excess carbon dioxide 5. Oceans warm, water evaporated and vapour adds to heat trap
What effect has the Industrial Revolution and the subsequent burning of fossil fuels had?	-more carbon dioxide causing the temperature to rise by an additional 1 to 3 degrees by 2005
What are 3 direct effects of Global Warming?	- increased number of heat waves -increased number of violent storms

	-above average temperatures in Arctic are melting glaciers and raising sea levels
What are the indirect effects of global warming?	-diseases extending their ranges because of warmer temperature -shifting plant and animal ranges as animals move to different habitat areas -coral reef losing their colours because microscopic algae can't handle the warmer temperatures
What problems has Global Warming created for Canada's Arctic?	-sea ice is shrinking and seasonal melt occurring earlier -polar bears are starving slowly (can't use ice to hunt seals) -permafrost melting so Arctic Communities are losing shorelines
What is permafrost ?	Permanently frozen subsoil
What problems has global Warming created for the rest of Canada	-lowered survival rate of spawning salmon (1/3 of what it was in 1990's) -winter recreation and ski areas would be affected -more droughts -more forest fires
What could be considered benefits of global warming for Canada?	-tree line extended north and up mountains -could lengthen growing season
How is the salmon industry affected by global warming?	-warmer water depletes phytoplankton resulting in smaller fish, -smaller fish can't survive the swim upstream to spawn -future ripple effects on ocean food chains and economies of fishing communities
What is the Kyoto Protocol ?	-agreement to reduce greenhouse gases by 6% of 1990 level by 2012. -countries not meeting targets could buy credits from other countries with less emissions
What is Canada's position among the emitters?	One of the top global emitters of greenhouse gases with amounts still rising despite modest target reductions

What difficulties does implementing the Kyoto Protocol face?	-fossil fuel industry heavily against it (costs too high and possible job loss) -federal government did the signing but the provincial gov'ts must regulate polluters
What are the sustainable sources of energy that could be used to lessen dependence on fossil fuels?	Wind turbines, solar power, tidal power, ground source energy (geothermal power) fuel cells
Can Canada make a difference?	YES!!! We consume 40 times as much energy as people in developing countries
Why is soil important as resource?	-it is the basis of the biosphere and provides survival for plant and animal life -takes a very long time to form soil -only 11% of the land can be used for growing crops
What is desertification?	Land turning to desert
What are the causes of desertification?	-deforestation -overgrazing -poor farming techniques
What improved farming techniques were developed from the lessons of the Dust Bowl of the 1930's?	-planted trees to form windbreaks -adopted contour ploughing -used wheat stubble and straw to stop soil erosion and return nutrients
What has been the effect of using pesticides and herbicides?	-led to toxic soil -led to food residues -soil sterilization -harm to agricultural workers -insects necessary for agriculture are poisoned (ie lady bugs) -use of organically grown food on the rise
What are genetically modified plants?	Plants that have been altered by splicing a gene from another organism into them making them more resistant to diseases or pests
Why are some farmers in favour of GM crops?	Claim GM cost less because require fewer pesticides and herbicides

Why are some scientists in favour of GM crops?	GM will help increase plant yields to feed another 3 million people in the next 30 years
What has been the effect of the controversy about GM foods?	-In Europe extreme consumer resistance so no GM products in stores -In N. America only 2 companies have responded to pressure :McCain and Heinz
How many GM foods have been approved in Canada?	Nearly 50: corn, soybeans, squash, canola potatoes, cotton -75% of all processed foods made from corn, soy or canola
What is the difficulty with labelling whether GM crop is in product?	-GM crops can be mixed with regular -GM seeds can be easily spread by wind, pollination and accidental transport by farm machinery
Argument in favor of GM say:	-not really different than other crops -people have been selective breeding for years and this is just the same -safety has been assessed by government
Arguments against GM crops say:	-has been a lack of long term testing -problems with crossbreeding with other crops -use of GM seeds make less developed countries reliant of multinational seed companies
What is biodiversity ?	- Variety of life on Earth
Why are tropical rainforests so important?	-are storehouses of biodiversity -absorb carbon dioxide from the atmosphere and give off oxygen -are home to indigenous people
Why is deforestation a cause of global warming?	-Less trees to absorb carbon dioxide and give off oxygen -forest removal can affect wind patterns precipitation and temperatures of areas far beyond the forests
How is wood used in the world?	54% for firewood

	33 % for lumber 13% for pulp and paper
What are immediate effects of deforestation?	1.trees cut down 2.without protection of forest cover, soil is stripped away by rain and melting snow 3.washed out soil raises river beds, leading to floods 4. soil silts up reservoir, shortening life of dams 5. silt forms new islands in rivers and depletes coastal fisheries
What areas are clearing rainforests?	-Brazil (largest clearing) -Ecuador, Columbia and Peru have been developed by oil companies -Indonesia is clearing main island of Java -Asia is losing forests at an alarming rate
Why had Thailand's ban on export of tropical hardwoods been unsuccessful?	-illegal loggers make huge profits sending timber across borders
What are the woods used for?	-fuel by local people, for industrial uses, and for specialty woods such as teak and rosewood
What are the effects of forest clearance?	-loss of forest's resources which could have been selectively harvested (nuts, rubber, plants for medicine -when trees removed the infertile soil is eroded by wind and rain -arid wasteland good only for limited cattle grazing -severe damage on hillsides with soil erosion silting lakes and river
What percent of the Earth's land cover are the temperate and northern forests?	-20 percent
What is Canada's portion of the world's temperate forests?	-1/4 of the temperate coastal -1/3 of the world's boreal coniferous forest and all of the world's old growth red and white pine
What is the value to Canada's economy from the forests?	Over 70 billion
Where and how much of the forest's in	91% of Alberta's forests degraded.

Canada have been damaged?	Quebec and Manitoba have 1/5 of forests damaged from dams and diversions
What are the consequences of the decline of the boreal forests?	-loss of boreal ecosystem -wildlife extinction
What is stewardship ?	-Careful management of resources so that they are sustainable
What attitudes are changing towards forests?	-Once thought of only as a source of revenue are now seen as a resource with many uses: recreation, research, industry and culture
What did the BC government do about concerns about the sustainability of BC forests?	-launched the PAS (Protected Areas Strategy) with target of preserving 12% of land for parks recreation and wilderness
How can steps be taken to save the forest?	-reducing paper use (1/5 of all wood used for paper: 1/2 of that used in packaging) -expanded recycling
How does Canada's use of paper compare with other countries?	-Canada uses 300 Kg paper per person compared to china's 27 kg and India's 4 kg
What is the recommended usage of paper by the UN Environmental Program	-30-40 kg per person
What is eco-tourism ?	-Using the wonders of the natural world to promote tourism based on the environment
What are the advantages of eco-tourism?	-transfer of wealth from developed country to less developed country -jobs are created for the Aboriginals (many for young people which are keeping them in their community)
What are problems with eco-tourism?	-can speed up the degradation of the environment that has attracted the tourists -overcrowding and increased pollution in fragile ecosystems