

Climate Change Mini-Project: "AWARENESS" POSTER

Purpose:

- ✓ To identify and describe indicators of global climate change
- ✓ To analyze different evidence of natural climate change and climate change influences by human activity
- ✓ To explain the natural factors and human activities known to affect the climate
- ✓ To describe the sources and sinks of greenhouse gases, as well as the causes and effects of anthropogenic greenhouse gases

Introduction:

The world's leading scientists agree that climate change is affecting the entire Earth. Unless we act soon, there will be serious outcomes for everyone. We must all begin to take action. Therefore, you are going to **create a poster** to raise awareness of the public or your community regarding the negative impact of climate change. The poster will require information from your class notes and textbook to complete. **All work will be done in class.**

Topic: _____

Requirements: Your poster will include the following:

- **Unique Title** which will attract your reader
- **Description** –
 - a) What is climate change?
 - b) How do(es) the topic(s) you have chosen relate to climate change?
 - c) What are the effects/impacts on climate or climate change? Specifically: How does your topic affect/impact the climate or climate change?
 - d) If possible, what are some specific examples related to your topic?
 - e) What are 5 ways you can help to reduce the impact of climate change? Your suggestions must be **SPECIFIC** and **practical**. (Do not include general or vague ideas.)
- **Persuasive Tone** – Convince viewer of the severity of the "Threat" of climate change
- **Pictures** – Topic related diagrams **in colour**
- **Your Names** – on the back

DUE: _____

“AWARENESS” POSTER RUBRIC

CRITERIA	MARK
Content: Description of Your Topic and How it Relates to Climate Change	0 ---- 1 ---- 2 ---- 3 ---- 4
Persuasive Tone: Convince viewer of the Threat of Climate Change	0 ---- 1 ---- 2
Visuals: Topic-related, coloured	0 ---- 1 ---- 2
Overall: Use of Space, Large Font, Neatness	0 ---- 1 ---- 2
TOTAL MARK: (Application)	/ 10

Name: _____ Date: _____ Period: _____

Lesson 1: Indicators and Impacts of Present Climate Change (ON Science 10 p.290-299)

DEFINITION:

Global warming: _____

Indicators (Evidence)	What is it? What causes it?	What are the impacts (Effects)?	Specific Examples (1 or 2)
1. Changes in Polar and Glacial Ice (p. 291)			
2. Rising Sea Level (p.292-293, 297)			
3. Ocean Acidity (p.292-293)			

Name: _____ Date: _____ Period: _____

Indicators (Evidence)	What is it? What causes it?	What are the impacts?	Specific Examples (1 or 2)
4. Climate and Health: Extreme Weather (p.294, 297)			
5. Changing Wind and Precipitation Patterns (p.295)			

Name: _____ Date: _____ Period: _____

Indicators (Evidence)	What is it? What causes it?	What are the impacts?	Specific Examples (1 or 2)
6. Changing Wind and Precipitation Patterns: Desertification, Droughts, and Other Outcomes (p.296, 297)			
7. Changing Wind and Precipitation Patterns: Storm Intensity and Frequency (p.296)			

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Indicators (Evidence)	What is it? What causes it?	What are the impacts?	Specific Examples (1 or 2)
8. Changing Biomes (p.297)			
9. Changing Biomes: Deforestation (p.298)			
10. Changing Biomes: Shrinking Wetlands (p.298)			

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Lesson 2: Discovery of Past Climate (ON Science 10 p.351-339)

DEFINITION:

Paleoclimatologist:

Evidence from ...	Details
<p>1. Tree Rings (p. 351)</p>	<p>What is a tree ring?</p> <p>What affects tree growth?</p> <p>What information can be revealed from tree rings about past climates?</p> <ul style="list-style-type: none">• A wide tree ring indicates:• A thin tree ring indicates:• A dark tree ring indicates:• A light tree ring indicates:• Other evidence:
<p>2. Ice Cores (p.353-355)</p>	<p>What is an ice core?</p> <p>Where can ice cores be found?</p> <p>What information can be revealed from ice cores about past climates?</p> <ol style="list-style-type: none">1. Dissolved and particulate matter in the ice:

Name: _____

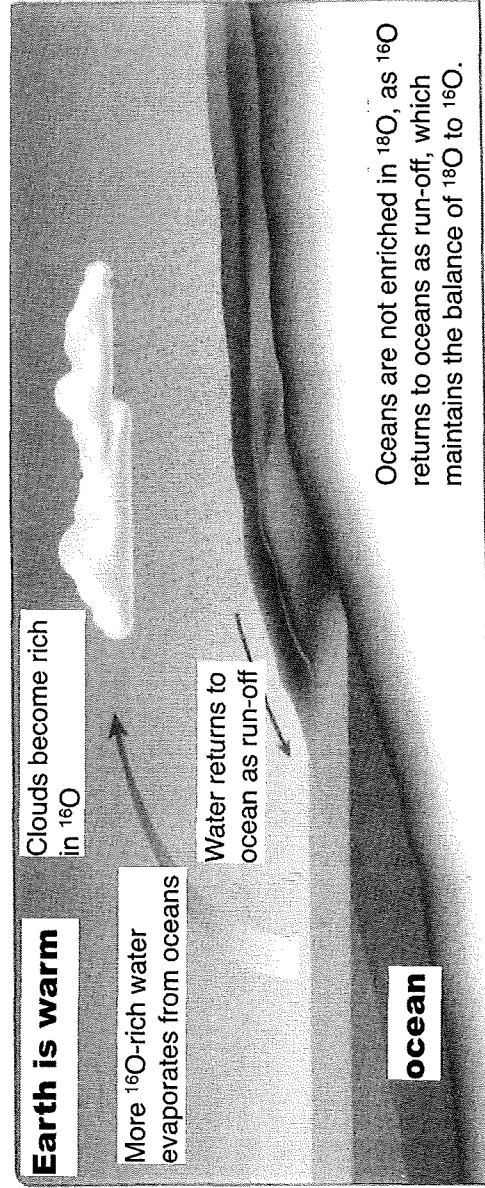
Date: _____

Period: _____

2. Physical characteristics of the ice:

3. The composition of trapped air bubbles;

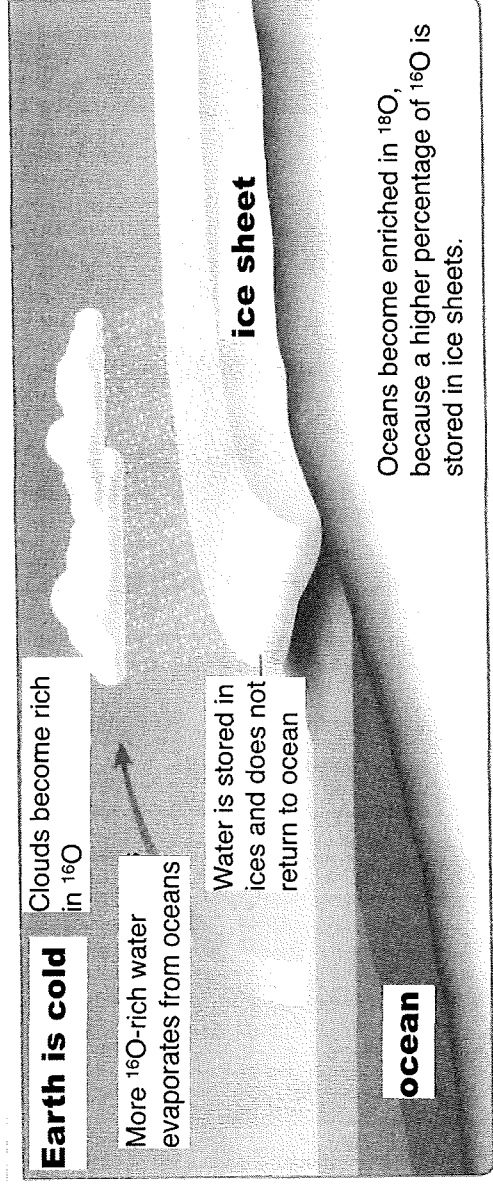
4. The composition of the ice:



Name: _____

Date: _____

Period: _____



3. Sedimentary Rock (p.356)

What is sedimentary rock?

What are preserved in sediments washed from the land and accumulate on ocean floors and lakebeds?

How does the sediment turn into sedimentary rock?

What information can be revealed from Sedimentary Cores from Lakes and Oceans about past climates?

Name: _____ Date: _____ Period: _____

	<p>What information can be revealed from Sedimentary Layers in Glacial Lakes about past climates?</p> <p>Varves:</p>
<p>4. Fossils (p. 357)</p>	<p>What are fossils?</p> <p>How do fossils form?</p> <p>What can become fossils?</p> <p>What information can be revealed from fossils about past climates?</p>

Name: _____ Date: _____ Period: _____

Lesson 3: Factors That Affect Climate Change (ON Science 10 p.269-278, 315-317)

DEFINITION:

Climate: _____

Atmosphere: _____

Greenhouse Effect: _____

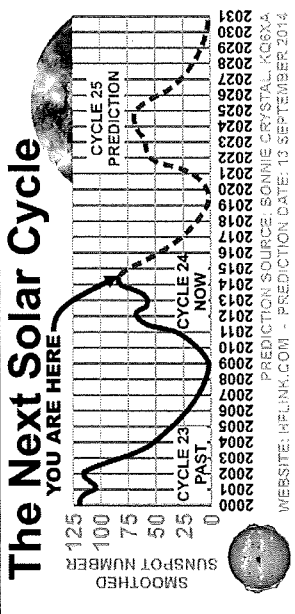
Hydrosphere: _____

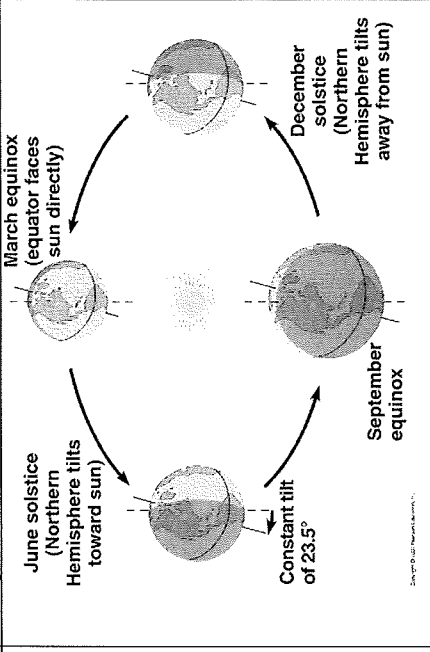
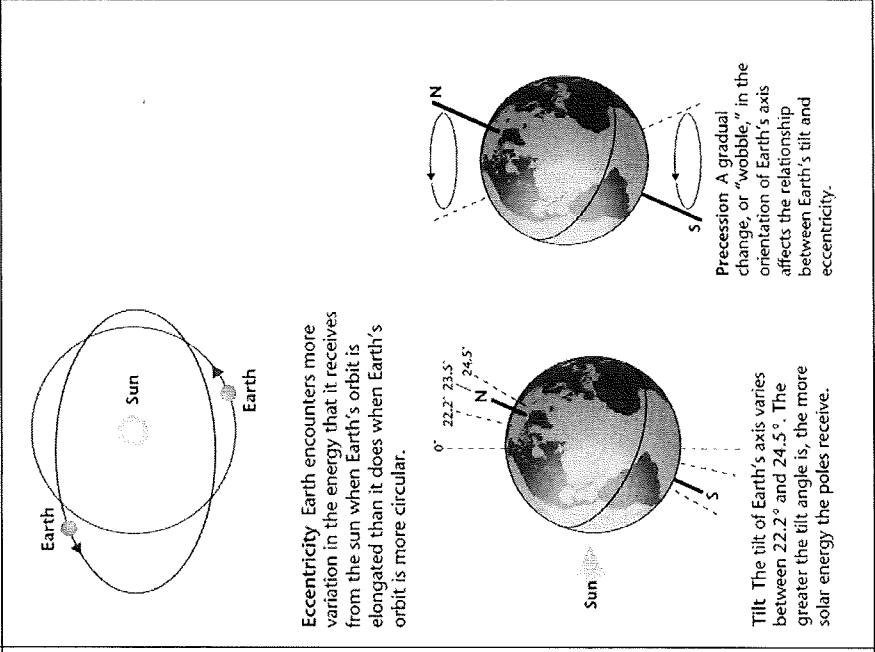
Heat capacity: _____

Albedo: _____

Tectonic Plate: _____

NATURAL FACTORS AFFECTING CLIMATE:

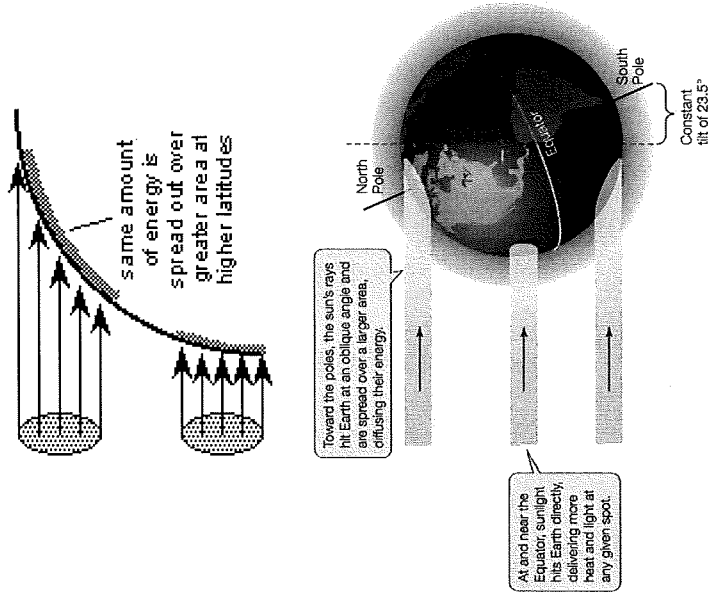
Natural Factor	How does the factor affect climate change?	Diagram
1. Earth and the Sun: Changes in Solar Activity (p. 270)		

Natural Factors	How does the factor affect climate change?	Diagram
<p>2. Earth and the Sun:</p> <p>Movement of Earth in Space (p. 270)</p>	<p>Earth is tilted at the angle of about 23.5°</p> <ul style="list-style-type: none"> As Earth moves around the Sun, this tilt affects how much solar energy receives by each region. Earth's 23.5° tilt causes the seasons: Northern Hemisphere: <ul style="list-style-type: none"> - Summer: Earth is tilted towards the Sun \Rightarrow more daylight hours, more direct sunlight \Rightarrow warmer temperatures - Winter: Earth is tilted away from the Sun \Rightarrow less daylight hours, less direct sunlight \Rightarrow cooler temperatures <p>Earth's revolution also affects seasons, but the Earth's tilt has more of an effect on seasonal changes in climate.</p>	 <p>Diagram illustrating Earth's orbit around the Sun and its axial tilt. The Earth is shown at four positions: June solstice (Northern Hemisphere tilted toward the Sun), March equinox (equator faces the Sun directly), September equinox, and December solstice (Northern Hemisphere tilted away from the Sun). A constant tilt of 23.5° is indicated.</p>
<p>3. Earth and the Sun:</p> <p>Changes in Earth's Rotation, Orbit and Tilt (p. 271)</p>		 <p>Diagram illustrating Earth's orbit around the Sun, showing eccentricity. Below it, two diagrams show Earth's axial tilt varying between 22.2° and 24.5°, illustrating precession.</p> <p>Eccentricity Earth encounters more variation in the energy that it receives from the sun when Earth's orbit is elongated than it does when Earth's orbit is more circular.</p> <p>Precession A gradual change, or "wobble," in the orientation of Earth's axis affects the relationship between Earth's tilt and eccentricity.</p> <p>Tilt The tilt of Earth's axis varies between 22.2° and 24.5°. The greater the tilt angle is, the more solar energy the poles receive.</p>

Natural Factors
4. Earth and the Sun: How does the factor affect climate change?

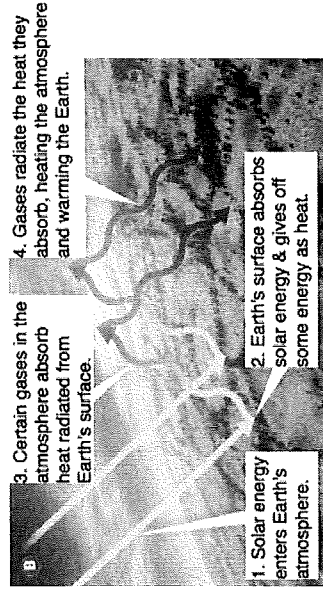
The Effect of Latitude on Climate and Seasons (p. 272)

Diagram



LIFE 9e, Figure 54.1

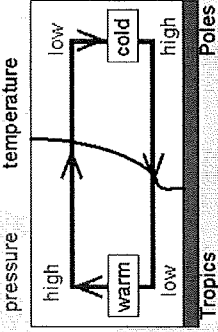
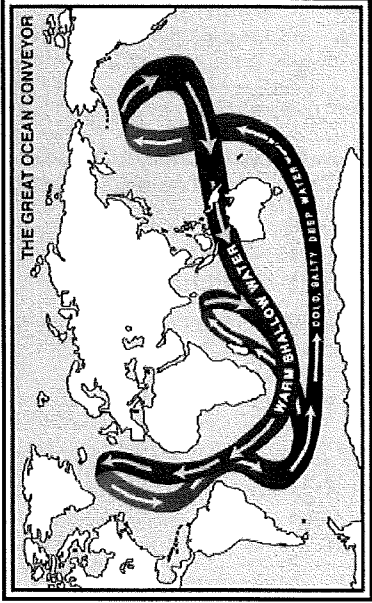
5. Atmosphere: Natural Greenhouse Effect (p. 273)



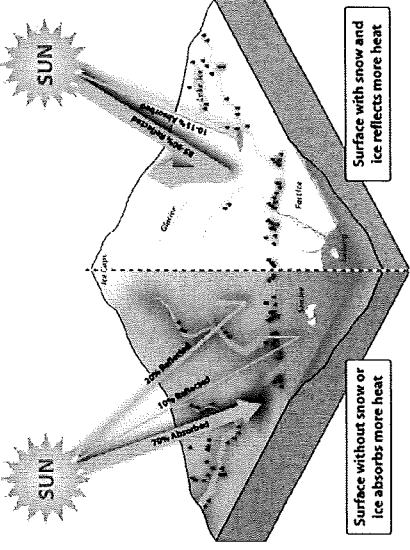
Name: _____

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Period: _____

Natural Factors	How does the factor affect climate change?	Diagram
<p>6. Atmosphere:</p> <p>Wind Disperse Energy through Atmosphere (p. 273)</p> <p>Energy Transfer in Atmosphere (p.315)</p>		<p>Warm air rises</p> <p>◆ Transfer of heat pole wards</p> <ul style="list-style-type: none"> - Warm air polewards - Cold air equatorwards  <p>The diagram illustrates atmospheric circulation. On the left, labeled 'Tropics', the air is 'warm' and at 'low' pressure. An upward arrow indicates the air rising. On the right, labeled 'Poles', the air is 'cold' and at 'high' pressure. A downward arrow indicates the air sinking. A horizontal arrow at the top shows air moving from the tropics to the poles, and a horizontal arrow at the bottom shows air moving from the poles to the tropics. The vertical axis is labeled 'pressure' and 'temperature'.</p>
<p>7. Atmosphere:</p> <p>Winds Move Ocean Currents (p. 274)</p> <p>Energy Transfer in Oceans (p.316-317)</p>		 <p>The map shows the 'THE GREAT OCEAN CONVEYOR'. It depicts a continuous loop of ocean currents. On the left side of the map, a thick black arrow labeled 'WARM WATER' moves northward. On the right side, a thick black arrow labeled 'COLD, SALTY DEEP WATER' moves southward. The text 'WINDS MOVE OCEAN CURRENTS' is written along the path of the currents.</p>

Name: _____ Date: _____ Period: _____

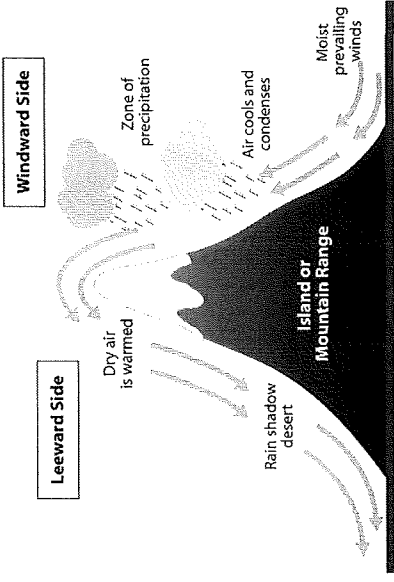
Natural Factors	How does the factor affect climate change?	Diagram
<p>8. Atmosphere:</p> <p>Winds Affect Precipitation (p. 274)</p>		
<p>9. Hydrosphere:</p> <p>Oceans and Lakes Act as Heat Reservoirs / Heat Capacity of Water (p. 275)</p>		
<p>10. Hydrosphere:</p> <p>Ice and Snow reflect Heat / Albedo (p. 275) Changing Albedo (p.321)</p>		

How does the factor affect climate change?

Diagram

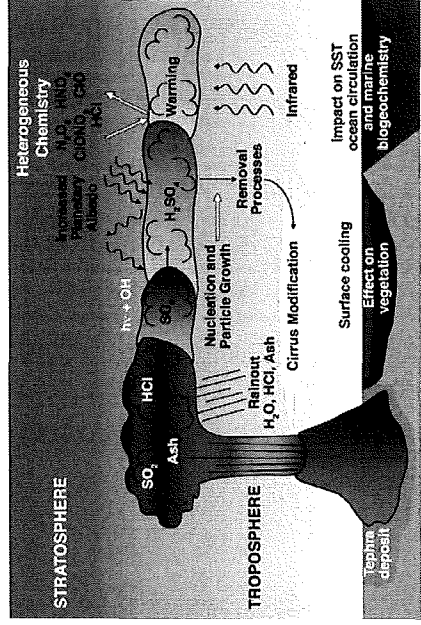
Natural Factors

**11. Moving Continents:
Tectonic Plates (p. 275)**



12. Moving Continents:

Volcanic Eruptions (p. 275)



Name: _____ Date: _____ Period: _____

Lesson 4: Greenhouse Gases and Human Activities (ON Science 10 p.277, 323-332)

DEFINITION:

Anthropogenic: _____

Anthropogenic Greenhouse Effect: _____

Greenhouse Gas: _____

Parts per million: _____

Sink: _____

HUMAN ACTIVITY AFFECTING CLIMATE:

Anthropogenic Factor	Details
Human Activity: (p. 277, 324, 329)	How does human activity affect climate change? (p.277, 329)
	How do greenhouse gases trap and absorb infrared radiation (heat) and produce a warming effect? (p.324)

GREENHOUSE GASES AND GLOBAL WARMING: (P.323-329)

Greenhouse Gases	Details
<p>Water Vapour (p.324)</p>	<p>How does water vapour enter the atmosphere?</p> <p>What affect the evaporation rate of water vapour in the atmosphere?</p> <p>Explain the positive feedback loop of water vapour.</p> <div data-bbox="308 105 730 630" data-label="Diagram"> <p>The diagram shows a circular feedback loop. At the top, it says 'Water Vapor and Temperature positive feedback loop'. The loop starts with 'more water vapor + albedo decreases' on the left. An arrow points to 'temperature increases' at the top. From there, an arrow points to 'evaporation increases/ ice melts' on the right. Finally, an arrow points back to 'more water vapor + albedo decreases' on the left, completing the loop.</p> </div>
<p>Carbon dioxide (p.325)</p>	<p>What are the natural sources?</p> <p>What are the anthropogenic sources?</p> <p>Name the carbon sinks.</p> <p>What and how human activities affect carbon sinks?</p> <p>How do carbon dioxide interact with water vapour?</p> <div data-bbox="1218 105 1429 630" data-label="Diagram"> <p>The diagram shows a cycle between CO2 and temperature. On the left, 'CO2' has an upward arrow pointing to 'TEMP'. From 'TEMP', an arrow points to 'WATER VAPOR'. From 'WATER VAPOR', an arrow points back to 'TEMP'. A large curved arrow on the right side of the cycle indicates a reinforcing or positive feedback loop.</p> </div>

Name: _____ Date: _____ Period: _____

Greenhouse Gases	Details
Methane (p.326)	How does it form? What are the natural sources? What are the anthropogenic sources?
Nitrous Oxide (p.327)	How does it form? What are the natural sources? What are the anthropogenic sources?
Ozone (p.327)	What is ozone? How does ozone layer protect the Earth and living organisms? How does depletion of ozone affect the Earth?

Name: _____ Date: _____ Period: _____

Greenhouse Gases	Details
Ground Level Ozone (p.328)	How does ground level ozone form? How does ground level ozone affect humans?
Halocarbons (p.328)	What are halocarbons? How do they form? What are natural sources of halocarbons? What are the most common halocarbons? How do halocarbons contribute to greenhouse effect? How do CFCs negatively affect Earth's ozone layer?