

Name: _____

Date: _____

SNC 2D – Lesson 1
The Earth's Dynamic Climate

***Write all answers in complete sentences. These are your class notes, so write neatly!**

***Use lined paper.**

***The information in your notes will be included in the unit test.**

Support Questions

- Answer the questions in complete sentences.
- Ask the teacher immediately if you do not understand the concept.

Notes

A. Climate System and Climate Change

- 1) Define climate and weather.
- 2) Name three components that interact to regulate our climate.
- 3) Define solar energy. What determines the amount of solar energy hitting the earth?
- 4) Define atmosphere. What is the air in our atmosphere made up of (include %)?
- 5) Define troposphere and greenhouse gases. What are the main greenhouse gases that occur naturally in the atmosphere?
- 6) Define hydrosphere. How much of the earth's water is salty and how much is fresh water?

B. Complete Support Question #1.

C. Transfers of Heat Energy

- 1) Define an electromagnetic wave and provide some examples.
- 2) What is radiant energy? What happens when radiant energy from the sun reaches the earth?
- 3) Complete Support Question #2.
- 4) Define albedo and heat sink.

D. Lab Activity – Albedo and Radiant Energy

- 1) Obtain the activity kit.
- 2) Read the lab on pages 8-9.
- 3) Your write-up should consist of: title, purpose, observations (chart), analysis (support question #3) and conclusion (support question #4).
- 4) Complete Support Question #5.

E. Conduction

- 1) Define: conduction and medium.
- 2) Provide two examples of conduction.
- 3) Complete Support Question #6.

F. Convection

- 1) Define convection and provide an example.
- 2) Explain the difference between a global convection current and a local convection current.
- 3) Draw and label a diagram showing the formation of water and land breezes (p. 14).
- 4) Define: thermal updraft.
- 5) Complete Support Question #7.

G. Key Questions (12 marks)

*Answer each question neatly and completely (#1-4).

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SNC 2D – Lesson 2
Earth's Climate System

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Support Questions

- Answer the questions in complete sentences.
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Notes

A. Factors Controlling the Earth's Climate System.

1) Prevailing Winds

- Define prevailing winds. What are they responsible for? What 2 forces cause the pattern of prevailing winds?

2) Atmospheric Convection Currents.

- Define a convection cell.
- Draw and label convection cells and prevailing winds around the world (page 3)
- Describe the pattern of movement in convection cells in the northern and southern hemispheres.

3) Coriolis Effect

- Describe the Coriolis Effect.
- Draw and label Figure 2.2 on page 4.

4) Predicting Prevailing Wind Patterns.

- State 2 simple rules one must remember when predicting prevailing winds.
- Define trade winds, westerlies and easterlies.

5) Jet Stream

- What is a jet stream?
- Describe the latitude, altitude and speed of a jet stream.
- Support Question #8 and #9.

B. Ocean Currents and Nearby Water.

- Look at the diagram of the Earth's major ocean currents.
- What factors influence ocean currents?
- Describe how oceans act as heat sinks.
- Support Question #10.

C. Elevation and Landscape Features.

- What happens to air temperature as you climb to a higher elevation?
- Describe what happens when air masses meet a mountain range.

- Draw and label a diagram of the formation of rain clouds on the windward side of the Rocky Mountains.
- Support Question #11.

D. Ecozones

- Define an ecozone and ecoregion.
- Draw the following table in your notes. Fill in the table.

Ecozone	Features	Location
Mixed Plains		
Boreal Shield		
Southern Arctic Ecozone		

- Support Question #12 a and b. (Useful websites: Canadian Council on Ecological Areas, the Canadian Biodiversity website and Environment Canada).

E. Key Questions (17 marks)

- Answer each question neatly and completely: #5, 6, 7, and 8.

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SNC 2D – Lesson 3
Greenhouse Effect

***Write all answers in complete sentences. These are your class notes, so write neatly!**

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Support Questions

- **Answer the questions in complete sentences.**
- **Ask the teacher immediately if you do not understand the concept.**

Notes

A. The Greenhouse Effect.

1. Define greenhouse effect and heat (thermal) energy.
2. Draw and label figure 3.1 found on page 2.
3. Answer Support Questions 13 and 14.

B. Gases Involved in the Greenhouse Effect.

1. Draw the following table in your notes. Fill in the table.

Gas	How it is produced?	Impact on Environment
Carbon Dioxide		
Methane		
CFC's		
Ozone		
Nitrous Oxide		
Water Vapour		

2. Answer Support Questions 15 and 16.

C. Changes in Carbon Dioxide Levels.

1. Define the carbon cycle.
2. Log onto the ILC website (ILC.org) and click on “Carbon Cycle” under lesson 3. (Remember to ask the teacher for username and password)
3. How are carbon dioxide levels measured? Compare carbon dioxide levels in the atmosphere over the past 1000 years.
4. Answer Support Question 19 a and b. Ask the teacher for graph paper. Remember to include a title and label your axes.

D. Key Questions (15 marks)

*Answer each question neatly and completely, 9, 10, 11 and 12.

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SNC 2D – Lesson 4
Climate Change: Causes and Consequences

***Write all answers in complete sentences. These are your class notes, so write neatly!**

***Use lined paper.**

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Support Questions

- Answer the questions in complete sentences.
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Notes

A. Climate Change: Examining the Evidence.

1. For each of the following natural processes, briefly explain how they can be used to measure past climates: tree rings, sea-floor sediments and ice cores.
2. Answer Support Question #20.

B. Possible Causes of Climate Change.

1. Natural Causes: Draw the following table in your notes and fill in the answers.

Natural Cause	Impact On Climate Change
Earth's orbit	
Plate tectonics	
Sunspots	
Volcanoes	
Asteroids and Comets	

2. Anthropogenic Causes: Briefly summarize how greenhouse-gas levels and deforestation have affected climate.
3. Answer Support Question #21.

C. Is Climate Change Happening Now?

1. Global temperatures: Define a temperature anomaly.

2. Briefly describe the job of the IPCC and what they have concluded about global temperatures.
3. Answer Support Question #22. Ask the teacher for graph paper. Remember to give your graph a title and label all axes.
4. What evidence has Ice and Sea-level rise provided over the years about climate change?

D. Lab Activity: Melting Icebergs.

1. Obtain the activity kit.
2. Read the lab on page 16.
3. You do not need to do a formal write-up. Simply provide your observations and analysis.
4. Answer Support Question #23.

E. Consequences of Climate Change.

1. Oceans: Why are sea levels rising?
Briefly discuss some of the consequences of rising sea levels.
What is the Great Ocean Conveyor Belt?
2. Land: Briefly describe how climate change will affect agriculture and forestry.
3. Biodiversity: How is climate change affecting the biodiversity of earth?
4. Pollution: Define smog.
What affect does pollution have on one's health?
5. Weather: How does climate change affect our weather?
6. Answer Support Questions #24, 25 and 26.

F. Activity: How Does Climate Change Impact Living Species? Awareness Raising Assignment

Task Overview

- a) Choose a living species, a plant or an animal, and research how climate change is impacting that species.
- b) Create an informative and creative brochure to raise awareness about how the living species you selected is being impacted by climate change. Be sure to include specific examples and facts/statistics to make your case. Your goal is to inspire others to take action!
- c) Refer to the Evaluation Rubric at the end of this assignment.

G. Key Questions (18 marks)

Answer the questions neatly and completely. #13, 14, 15, 16, 17, and 18.

Evaluation Rubric

Criterion	Descriptor	Level 10=Exceeding Expectations 8=Meeting Expectations 6=Approaching Expectation 4=Below Expectations 2 or less=Not Complete
A: Knowledge and Understanding	The students demonstrate good knowledge and understanding of content through accurate descriptions, explanations and examples.	
B: Investigating	The students use methods to collect and record appropriate information consistent with the research question; the students satisfactorily address the research question.	
C: Communicating	The students communicate information and ideas by using a style that is often appropriate to audience and purpose; the student structures information and ideas in a way that is often appropriate to the specified format.	
		Total: /30

Comments:

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SNC 2D: Lesson 5
What Can Be Done About Climate Change ?

- *Write all answers in complete sentences. These are your class notes, so write neatly!
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Support Questions

- Answer the questions in complete sentences.
- Ask the teacher immediately if you do not understand the concept.

Notes

- A. Answer all of the Support Questions found in Lesson 5: #27, 28, 29, 30, 31, 32, 33 and 34.
- B. Answer all of the Key Questions found on page 18, Lesson 5: #19, 20, 21, 22, and 23.
- C. **Assignment: The Power of Youth: Climate Change Heroes Assignment.**

Across the planet, young people are taking action on climate change. According to Al Gore, Former U.S. Vice President:

“ There is no doubt that young people today are more aware of environmental problems than my generation ever was. As this new generation comes of age, it faces the enormous challenge of solving global warming In order to fix this crisis, everyone needs to be involved. I have faith that young people have both the ability and the enthusiasm to put a stop to global warming.”

Indeed, young people all over the world are taking a stand against global warming, and are showing tremendous energy and passion around this issue. As one youth activist puts it:

“What could be more important than the future of our world? As young people, we have the most at stake, so we should be stepping up to our roles as the major stakeholders and stand up for the kind of future that we want.”

Instructions

1. Conduct research on the Internet to learn about the various initiatives youth are taking on to fight climate change.

2. Take a moment to think about what qualities you believe a “hero” possesses. Think about someone you consider to be a hero and ask yourself, “What makes this person a hero?” Jot down your thoughts in the graphic organizer provided on the next page.
3. Select one person, or youth organization from the research you conducted that is fighting climate change that really stands out to you; someone you would consider a **Climate Change Hero**. Write a blog post (1 – 2 paragraphs on Word) about this young person or group that highlight their efforts. Answer the following questions about the hero you have selected:
 - a. Where is this person from?
 - b. How old is the person/people?
 - c. Is this person/group facing any local challenges related to climate change (i.e. Is their community being impacted by drought? Is their community being impacted by the loss of a particular species?)
 - d. How is this person/group addressing these challenges/taking a stand against climate change?
 - e. What help or resources did the person/group use?
 - f. Any other important information related to their story.

Climate Change Hero Blog Post

What qualities do heroes possess?
My Climate Change Hero:
Location:
Age:
Is this Person/Group facing any local challenges related to climate change?
How is this person/group addressing these challenges/taking a stand against climate change?
What help or resources did the person/group use?
Any other important information related to their story.

