

Human Impact: Climate Change

Name:

Teacher:

Class:

Earth and Space Science

Unit 4

Lab Notebook

Lesson 1:

How Do We Know What To Believe?

Question: How do we know if a source is credible and reliable?

Directions: Review the information about dihydrogen monoxide as a class and take notes below.



Discuss with your group: Should this substance be banned?

Lesson 2: What Do Greenhouse Gases Do to the Environment?

Question:

Hypothesis:

Procedure (include a sketch of your experimental setup in the box provided):

Lesson 2

Data: Design a data table to record your data from this experiment. Record your data here during the experiment.

Lesson 3:

What Is Natural Climate Variation?

Question: How can studying the global temperatures over a long period of time help us to understand climate change?

Directions:

1. Follow the procedure for Condition A or Condition B.
2. Use the color key to determine the change in temperature over a five-year period.
3. Record your data in the table.
4. Graph your data on a piece of graph paper.

Procedure:

Condition A	Condition B
<ol style="list-style-type: none"> 1. Partners draw five beads out of their bin. 2. Use the color key to determine change in temperature over a five-year period. 3. Partners record data point. 4. Return all beads to the bin. 5. Repeat 15–21 times (target set by the teacher). 	<ol style="list-style-type: none"> 1. Partners draw five beads out of their bin. 2. Use the color key to determine change in temperature over a five-year period. 3. Partners record data point. 4. Return all beads to the bin. 5. Repeat three times. 6. After, remove four blue beads from the bin and place in a cup. These remain out of the bin for the rest of the lab. 7. Repeat until the number of years is equal to the target set by the teacher.

Lesson 3**Data:**

Time (years)	Change in Temperature (oF)
5	
10	
15	
20	
25	
30	
35	
40	
45	
50	
55	
60	
65	
70	
75	

Graph your data on a separate piece of graph paper.

Discussion Questions:

1. What trends do you see in your data?
2. Does your data represent natural climate variation?
3. What is different about Condition A compared with Condition B?
 - o How might this affect the data?

Lesson 5:

Model Man-Made Climate Change

Question: How can we model climate change by including human impact on the carbon cycle?

Hypothesis: Which jar will heat up the fastest? Explain using the model and your knowledge of science to support your response.

Procedure:

1. Add 200 mL of water to each jar.
2. Turn on the heat lamp to get warm while you finish your prep.
3. Record the initial temperature inside each jar using the infrared thermometer.
4. Set up each jar condition:
 - Jar A: unlit floating candle, no cover
 - Jar B: unlit floating candle, plastic wrap cover
 - Jar C: lit floating candle, plastic wrap cover
5. Take the temperature of each jar by peeling off the plastic wrap and aiming the infrared thermometer at the air inside the beaker.
6. Take the temperature every 2 minutes for 20 minutes.

Lesson 5

Data: Record a drawing of your model with labels for what each part of the model represents.

A large, empty rectangular box with a thin black border, intended for a student to draw a model and label its parts.

Lesson 5

Record your results below.

Time (minutes)	Temperature of Jar A (°F)	Temperature of Jar B (°F)	Temperature of Jar C (°F)
0			
2			
4			
6			
8			
10			
12			
14			
16			
18			
20			

Discussion Questions:

1. What does each jar represent?
 - What does each part of the model represent?
2. What factors affect air temperature?
3. What are the limitations of this model?

Lesson 7:

What Will Happen to Oceans?

Question: How will climate change impact our oceans?

Directions:

1. Observe the materials on the table.
2. Create a testable question about ocean acidification that you can use the materials to answer.
3. Create a procedure for your experiment.
4. Record your hypothesis.
5. Complete your experiment by following your procedure.
6. Record your results.
7. Write a conclusion based on your data.

Testable Question:

Procedure:

Lesson 7

Hypothesis:

Data:

Lesson 7

Conclusion: What do your experimental results indicate about the impact of climate change on oceans? Explain using evidence and justify your response.

Lesson 8: What Will Happen to Human Lives?

Question: How will climate change impact human lives across the world?

Directions:

1. Look up the location of your eyewitness account.
2. Read the scenario and answer the questions below.

Analysis Questions:

1. How would you describe the environment of your location?

2. What plants and animals are affected in your region? How are they affected?

Lesson 8

3. How has climate change impacted the way humans interact with the environment?

4. What steps is your eyewitness trying to take to mitigate climate change?

Lesson 9: Green Energy

Question: What type of energy could be used as a realistic energy solution?

Directions:

1. Research your energy source.

2. Create a 2-minute presentation that addresses the benefits and drawbacks of using your energy source.
 - a. Consider including information on the economic, social, and environmental impacts of using that energy source.

Data: Record notes for your energy source presentation in the graphic organizer below.

Energy Source	Benefits	Drawbacks
Economic		
Social		
Environmental		
Other		

Lesson 9

Class Presentations: Record notes from other groups as they present.

Energy Source	Notes

