

2-26-10

Project Bright IDEA 2: Interest Development Early Abilities

**A Jacob Javits Gifted Education Program
Funded by the US Department of Education
2004-2009**



Concept: Systems

Topic: Global Warming: A Study in Interdependence

By: Doris Kidd, Nancy Hanley

Grade Level: 5

**The North Carolina Department of Public Instruction
Exceptional Children Division
Academically or Intellectually Gifted Program**

The American Association for Gifted Children at Duke University

Big Ideas Manifested

Topic – Global Warming
Text – The Down to Earth Guide to Global Warming
Author – Laurie David and Cambria Gordon

Concepts	Themes
Systems Change Relationships Cycles Patterns	Interdependence Change <ul style="list-style-type: none"> • Change may generate change/adaptations • Symbiotic relationships
Issues or Debates	Problems or Challenges
<ul style="list-style-type: none"> • Global warming- Fact or fiction? • Consumption vs. conservation 	<ul style="list-style-type: none"> • What effect does one’s carbon footprint have on world ecosystems? • What are the effects of global warming on ecosystems? • Future planning relating to disruptions in the ecosystems
Processes	Theories
<ul style="list-style-type: none"> • Scientific Method • Cooperative Learning • Research/Inquiry • Inventive Process 	<ul style="list-style-type: none"> • The Greenhouse Effect is a consequence of global warming.

Paradoxes	Assumptions or Perspectives
<ul style="list-style-type: none"> • Conservation costs more money • Companies that have previously profited from destroying the environment are now profiting from going “green.” 	<ul style="list-style-type: none"> • Our society has chosen consumerism over conservation

Concept: Systems

Topic: Global Warming

Suggested Text Selection(s): The Down to Earth Guide to Global Warming, An Inconvenient Truth, Science Fiction: A Skeptic’s Guide to An Inconvenient Truth by Marlo Lewis Jr.

Look, Listen and Identify:

Intelligent Behaviors

Story Focus: Thinking Flexibly, Questioning and Posing Problems, Thinking and Communicating with Clarity and Precision, Taking Responsible Risks, Creating, Imagining, Innovating, and Thinking interdependently.

Student Activities: Thinking Flexibly, Metacognition, Questioning and Posing Problems, Thinking and Communicating with Clarity and Precision, Cooperative Learning, Imagining, Innovating, Thinking Interpedently and Role Playing.

NC Standards:

Science:

Goal 1: The learner will conduct investigations to build an understanding of the interdependence of plants and animals.

Objectives: 1.1-1.7

Social Studies:

- Goal 1: Explain how people of the United States and other countries of North America adapt to, modify and use their natural environments.
- Goal 3: Examine how changes in the movement of people, goods and ideas have affected ways of living in the United States.
- Goal 6: Relate how certain technological discoveries have changed the course of history and reflect on the broader social and environmental changes that can occur from the discovery of such technologies.
- Goal 6: Predict future trends in technology management that will benefit the greatest number of people.

Math:

Goal 4: Data Analysis and Probability

Objectives: 4.01-4.03

Language Arts: 1.031: Increase vocabulary by reading different types of text, studying how words work, participating in discussions and following the writing process.

2.06: Make choices of reading material to match the purpose for reading.

Local Pacing Guide Timeline:

See One Stop Curriculum Planning Link:

www2.wcpss.net

Departments

Curriculum and instruction

One Stop Resource for Curriculum Planning

Thinking Skills Focus: Pose and Answer Questions, Thinking Flexibly, Analyzing and Evaluating information

Topic Focus: Global Warming

Concept Focus: Systems

Overarching Generalizations:

Science:

- Undisciplined consumption of natural resources may impact the health of an ecosystem.
- The viability of system may depend upon its ability create balance and can define its structure.
- Interdependence may develop within and between systems.

Concept Focus: Change

Overarching Generalizations:

Science:

- Global warming may result from changes within existing systems.
- Global warming may cause changes within existing systems and in future systems.
- Change may generate adaptations.

More Complex Generalizations (Two or more concepts):

- New technologies and scientific breakthroughs may produce positive economic change, and may adversely affect an ecosystem.
- A system's survival may depend upon its ability to cooperate and with other systems and adapt to changes.

Directions for Teachers:

Display sentence strips with the generalizations. Discuss topics and vocabulary words needed to gain a deeper understanding of the conceptual lessons.

Suggested Topics for Discussion:

Project Bright IDEA Javits Research funded by US Department of Education
North Carolina Department of Education and The American Association for Gifted Children,
Duke University

Systems, Ecosystems, Growth and Change: Adaptation, Global Warming, Interdependence

Suggested Vocabulary Words for Discussions

- Names of various world ecosystems
- Adaptation/change
- Consumerism
- Conservation
- Carbon footprint
- Ecosystem
- Equilibrium; Balance within nature
- Extinction
- Fossil fuel
- Global Warming
- Green; Green Revolution
- Greenhouse gas
- Interdependence
- Natural Resources
- Organism
- System
- Symbiotic

See Building Academic Vocabulary- AG Resource.....

A Six-Step Process for Teaching Academic Vocabulary Terms:

1. Provide a description, explanation or example of the new vocabulary term.
2. Ask students to restate the description, explanation or example in their own words using complete sentences.
3. Ask students to construct a picture, symbol or graphic representing the term or phrase.
4. Engage the students periodically in activities that help them add to their knowledge of the terms in a booklet that they have created (Keep it simple.)
5. Periodically ask students to discuss the terms with one another (**Think** of your favorite vocabulary words from the unit; **pair** with a vocabulary buddy, **share** by discussing the vocabulary terms with your vocabulary buddy.) Teacher should model process each time before students do the Think, Pair, Share with Vocabulary Buddy.
6. Construct games to periodically involve students and allow them to play with the terms.

Robert Marzano

Vocabulary Extension:

Building Academic vocabulary...

Select a generalization(s) and essential questions. Introduce one or more of the following topics:

- A. What is the nature of interdependence within world ecosystems?**
- B. What effect does one's carbon footprint have on world ecosystems?**
- C. How can mankind plan for future challenges within the ecosystem/How can mankind live in harmony with nature?**

Six Facets of Understanding

- **Based on generalizations. Our essential questions come from these facets of learning.**

New technologies and scientific breakthroughs may produce positive economic change, and may adversely affect an ecosystem.

A system's survival may depend upon its ability to cooperate and with other systems and adapt to changes

Facet 1 – EXPLANATION
What is the nature of interdependence within world ecosystems? What is a system? How might a classroom represent a system? If we look at a classroom as part of a larger system, explain how disruptions within this sub-system would affect a school. Identify some problems or challenges that could affect the larger system.
Facet 2 - INTERPRETATION
What is the nature of interdependence within world ecosystems? In the book, <u>The Down to Earth Guide to Global Warming</u> , the authors use visual images to dramatize the effects of a change within an ecosystem and the effects of those changes. Locate photos to demonstrate the effects of global warming on the earth. Assign a logo to your chosen photograph using figurative language to capture your audience: similes, metaphors, irony, or analogies. Examples; Global warming is like.... Oven: Pizza:: Global Warming: _____ Irony: Clorox Company represents itself as being green.
Facet 3 - APPLICATION
How can mankind plan for future challenges within the ecosystem/How can mankind live in harmony with nature? Write an editorial to your school newspaper supporting or refuting the existence of global warming In preparation to write your article, participate in a class discussion on the concept of global warming. Research the following discussion topics: What is the proof that global warming is real? Which events, natural disasters, changes in temperature and changes in ecosystems represent human contributions to global warming? To which degree might “global warming” result from cyclical patterns in nature? How might current imbalances in world ecosystems be explained? How have the ecosystems shown a breakdown? .
Facet 4 - PERSPECTIVE

**What effect does one's carbon footprint have on world ecosystems?
How can mankind plan for future challenges within the ecosystem/How can mankind live in harmony with nature?**

Prepare a persuasive essay regarding the impacts of global warming to present to a panel of the following corporations:

- Progress Energy
- Smithfield Packing
- RJ Reynolds
- Pepsi
- Warehouse Paper Company
- Microsoft
- Walmart

In your essay, be sure to anticipate the various companies' perspectives and their corresponding responses, particularly in terms of economic growth and development. Outline ways change would directly benefit the companies and their respective shareholders.

Facet 5 – EMPATHY

**What effect does one's carbon footprint have on world ecosystems?
How can mankind plan for future challenges within the ecosystem/How can mankind live in harmony with nature?**

Pretend that one of the following people or animals has taken a trip to the future and landed in your town: What changes would they see and how would they feel about them? Deliver a monologue from the perspective of one of the characters below:

- Henry David Thoreau
- Native People
- Triceratops
- Jacques Cousteau
- Charles Darwin
- Other

Facet 6 – SELF-KNOWLEDGE

**What effect does one's carbon footprint have on world ecosystems?
How can mankind plan for future challenges within the ecosystem/How can mankind live in harmony with nature?**

Make a movie, create a cartoon or voice thread, or design a piece of artwork that addresses the following questions:

A. What you are doing to lessen your carbon footprint? What steps are you taking? What else could you do? What are you not willing to do and why?

B. Are you taking a stand on global warming? Relate the issue of global warming to your own life. Do you see the issue the same as other people in your family?

C. How are your views of global warming shaped by other forces? What blind spots do you have? How have you changed your view? How do you feel now?

**Read:
Task Rotation Learning Activities**

3-5

All conceptual activities must include discussing and/or relating to the selected generalization(s) through essential questions.

Generalizations:

- Undisciplined consumption of natural resources may impact the health of an ecosystem.
- The viability of system may depend upon its ability create balance and can define its structure.
- Interdependence may develop within and between systems.

- **Guiding Question for task rotation:** What is the nature of interdependence within world ecosystems? Undisciplined consumption of natural resources may impact the health of an ecosystem.
- The viability of system may depend upon its ability create balance and can define its structure.
- Interdependence may develop within and between systems.

Guiding Question for task rotation: What is the nature of interdependence within world ecosystems?

<p style="text-align: center;">Mastery Learner (A) Sensing- Thinking</p>	<p style="text-align: center;">Interpersonal Learner (B) Sensing-Thinking</p>
<p>Identify and describe the various components of an ecosystem:</p> <ul style="list-style-type: none"> • Choose an ecosystem. • List a variety of living and non-living components to your ecosystem. • Design a graphic organizer to show the relationship between plants and animals in your chosen ecosystem. • Identify the functions of organisms within the population of your ecosystem. • Identify problems existing in the ecosystem. <p style="text-align: center;">V _ L _ S _ M _ B _ P _ I _ N _</p>	<p>Personify part of an ecosystem.</p> <ul style="list-style-type: none"> • In groups of three or more, select an ecosystem for further research. • Decide who will take on the roles of which organisms in that ecosystem. • Write and act out a script describing the symbiotic relationships you encounter within your ecosystem. For example, if you are a sloth in the Amazon Rainforest, explain your impact upon plants in the rainforest. How do other organisms affect you? <p style="text-align: center;">V _ L _ S _ M _ B _ P _ I _ N _</p>

<p style="text-align: center;">Understanding Learner (C) Intuitive-Thinking</p>	<p style="text-align: center;">Self-Expressive Learner (D) Intuitive-Feeling</p>
<p>Debate the importance of elements within an ecosystem.</p> <ul style="list-style-type: none"> • As a group, select an ecosystem for further research. • Based upon your research, hypothesize which components might be the most significant for the health and prosperity of that ecosystem. • Independently, choose one of the components of your ecosystem. Prepare to debate upon your component's importance within your chosen ecosystem. How is your component critical to life in your ecosystem? • Evaluate- At the end of your debate, do you still feel that your organism is the most important or have your feelings changed? • As group, re-prioritize the importance of the various components within your ecosystem. • Discuss the challenges associated with this task. <p style="text-align: center;">V _ L _ S _ M _ B _ P _ I _ N _</p>	<p>Creatively represent the concept of interdependence within an ecosystem.</p> <ul style="list-style-type: none"> • Research an ecosystem of your choice. • Create a piece of art, a poem or song to demonstrate your understanding of relationships within a chosen ecosystem. <p>Considerations for your work:</p> <ul style="list-style-type: none"> • Who are the organisms in your ecosystem and how do they affect each other? • What changes might affect your ecosystem? <p style="text-align: center;">V _ L _ S _ M _ B _ P _ I _ N _</p>

Real World Connections With Products:

Real World Applications:

Real World Terms:

Connect all products in the unit to real world applications reflecting the concept, generalizations and topic. The above is an example of how this might be accomplished.

Concept Focus:

Overarching Generalizations:

More Complex Generalizations (Two or more concepts):

Essential Question

(Include concept and intelligent behavior that leads to deeper understanding of the concept through exploration of the generalization)

Materials Needed for Task Rotation and/or Task Rotation Menu

MetaCognitive Discussion (Essential Questions):

(Whole Group)

Conceptual Perspectives:

Intelligent Behaviors:

Literary Perspectives:

Student/Teacher Reflections

Math Task Rotation Learning Activities

5th

All conceptual activities must include discussing and/or relating to the selected generalization(s) through essential questions.

Carbon Footprint

What is a revolution and what is a green revolution?

Using a timeline, show how the green revolution has progressed from the early 1900's to today

<p style="text-align: center;">Mastery Learner (A) Sensing- Thinking 1</p> <p>Identify items or activities that contribute to your global footprint. Rate the activities in order of their greatest impact on the environment and display your data in the form of a graph. Can you find any activities that do not impact your global footprint?.</p> <p>Calculating your carbon footprint: actonco2.direct.gov.uk/</p> <p>Based on gathered data, organize a line graph showing the effects of global warming on weather</p> <p style="text-align: center;">V _ L _ S _ M _ B _ P _ I _ N _</p>	<p style="text-align: center;">Interpersonal Learner (B) Sensing-Thinking 4</p> <p>The ten greenest cars are sitting together at a local car dealership. You and your team are going to write and act out a skit involving the following characters:</p> <ul style="list-style-type: none">• a customer searching for an eco-friendly car• a salesperson knowledgeable about CO2 emissions• cars that can talk about their eco-friendly benefits and amenities. <p>Use the following link to research information for your role which may include: the total CO2 emissions by car, miles per gallon, engine size, passenger seating and amenities.</p> <p>http://cars.uk.msn.com/news/top_ten_article.aspx?cp-documentid=475361</p> <p style="text-align: center;">V _ L _ S _ M _ B _ P _ I _ N _</p>
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<p>Understanding Learner (C) Intuitive-Thinking 2</p> <p>Are CO2 emissions the number one reason for climate change? What other factors affect climate change? Use data to support your findings.</p> <p>V _ L _ S _ M _ B _ P _ I _ N _</p>	<p>Self-Expressive Learner (D) Intuitive-Feeling 3</p> <p>http://www.carbonfootprint.com/calculator.aspx geobytes.com (calculating distance tool)</p> <p>Find two cities in NC that are roughly 200 miles apart. Plan a trip between the two NC cities. Using the website links above, research the carbon emissions of each mode of transportation (car, plane, walk, motorbike).</p> <p>In comparing the carbon emissions for each means of transport, decide on the most eco-friendly method of transportation. Make sure your calculations include return trips.</p> <p>Develop a brochure enticing people to use this method of travel the next time they travel between the two cities.</p> <p>V _ L _ S _ M _ B _ P _ I _ N _</p>
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Concept Focus:

Overarching Generalizations:

More Complex Generalizations (Two or more concepts):

Essential Question(s):

(Include concept and intelligent behavior that leads to deeper understanding of the concept through exploration of the generalization)

Materials Needed for Task Rotation and/or Task Rotation Menu

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MetaCognitive Discussion (Essential Questions):

(Whole Group)

Conceptual Perspectives:

Intelligent Behaviors:

Literary Perspective:

Student/Teacher Reflections

Concept:

Topic:

Generalization(s):

Almost everything we do in life leads to emissions of carbon dioxide. Your carbon footprint is a measure of the impact your activities have on the environment in terms of the amount of gasses emitted. It is measured in units of CO2 and kilograms.

**Increased use of coal, oil and gas (fossil fuels) are leading causes of global warming.
Essential Question(s):**

Deforestation also impacts global warming.

Task Rotation Menu

Level	Mastery	Understanding	Self-Expressive	Interpersonal
1				
2				
3				

Real World Connections With Products:

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Concept Focus:

Overarching Generalizations:

More Complex Generalizations (Two or more concepts):

Essential Question:

(Include concept and intelligent behavior that leads to deeper understanding of the concept through exploration of the generalization)

Materials Needed for Task Rotation and/or Task Rotation Menu

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MetaCognitive Discussion (Essential Questions):

(Whole Group)

Conceptual Perspectives:

Intelligent Behaviors:

Literary Perspective:

Student/Teacher Reflections:

Student Reflections and Assessments
Task Rotation Learning Experience
K-2

All conceptual activities must include discussing and/or relating to the selected generalization(s) through essential questions.

<p>Mastery Learner (A) Sensing- Thinking</p> <p>V _ L _ S _ M _ B _ P _ I _ N _</p>	<p>Interpersonal Learner (B) Sensing-Thinking</p> <p>V _ L _ S _ M _ B _ P _ I _ N _</p>
<p>Understanding Learner (C) Intuitive-Thinking</p> <p>V _ L _ S _ M _ B _ P _ I _ N _</p>	<p>Self-Expressive Learner (D) Intuitive-Feeling</p> <p>V _ L _ S _ M _ B _ P _ I _ N _</p>

Real World Connections With Products:

Real World Applications:

Real World Terms:

Connect all products in the unit to real world applications reflecting the concept, generalizations and topic. The above is an example of how this might be accomplished.

Concept Focus:

Overarching Generalizations:

More Complex Generalizations (Two or more concepts):

Essential Question:

(Include concept and intelligent behavior that leads to deeper understanding of the concept through exploration of the generalization)

Materials Needed for Task Rotation and/or Task Rotation Menu

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MetaCognitive Discussion (Essential Questions):

(Whole Group):

Conceptual Perspectives:

Intelligent Behaviors:

Literary Perspective:

Student/Teacher Reflections

A. What effect does one’s carbon footprint have on world ecosystems?

- Identify and analyze the functions of organisms within an ecosystem
- Discuss role of light, temperature and soil conservation in an ecosystem’s capacity to support life.
- The learner will conduct investigations to build an understanding of the interdependence of plants and animals.

B. What are the effects of global warming on weather?

- The learner will conduct investigations and use appropriate technology to build an understanding of weather and climate
- Explain how people of the United States and other countries of North America adapt to, modify and use their natural environments

C. How can mankind live in harmony with nature?

- Explain and evaluate some ways that humans affect ecosystems; habitat pollution, increased nutrients. Rotation- choose 1 way to explain global warming’s effect on habitat, etc.
- Explain how people of the United States and other countries of North America adapt to, modify and use their natural environments

Student Reflections and Assessments

Task Rotation Learning Experience

3-5

All conceptual activities must include discussing and/or relating to the selected generalization(s) through essential questions.

<p style="text-align: center;">Mastery Learner (A) Sensing- Thinking</p> <ul style="list-style-type: none">• Design a display to show the effects of global warming on an ecosystem.• List and describe four ways to lessen the effects of global warming. Base your decisions on gathered data.	<p style="text-align: center;">Interpersonal Learner (B) Sensing-Thinking</p> <ul style="list-style-type: none">• You have been chosen to make a presentation to members of the Environmental Protection Agency regarding the effects of global warming on ecosystems. Research and prioritize a list of the causes having the greatest effect on your ecosystem’s ability to sustain life.• Convince the panel to make appropriate
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<p style="text-align: center;">V _ L _ S _ M _ B _ P _ I _ N _</p>	<p>policy changes regarding conservation as a result of your presentation.</p> <p style="text-align: center;">V _ L _ S _ M _ B _ P _ I _ N _</p>
<p style="text-align: center;">Understanding Learner (C) Intuitive-Thinking</p> <ul style="list-style-type: none"> • Compare and contrast two ecosystems in terms of the effects of global warming. • Summarize the effects of global warming on the weather within and ecosystem of your choice. • Argue: How can mankind live in harmony with nature? <p style="text-align: center;">V _ L _ S _ M _ B _ P _ I _ N _</p>	<p style="text-align: center;">Self-Expressive Learner (D) Intuitive-Feeling</p> <ul style="list-style-type: none"> • Write a song that articulates current problems in a selected ecosystem caused by global warming. • Brainstorm ways that mankind can live in harmony with nature. Create a work or art that exemplifies the theme of balance and interdependence as related to ecosystems and global warming. <p style="text-align: center;">V _ L _ S _ M _ B _ P _ I _ N _</p>

Real World Connections With Products:

Real World Applications:

Real World Terms:

Connect all products in the unit to real world applications reflecting the concept, generalizations and topic. The above is an example of how this might be accomplished.

Concept Focus:

Overarching Generalizations:

More Complex Generalizations (Two or more concepts):

Essential Question:

(Include concept and intelligent behavior that leads to deeper understanding of the concept through exploration of the generalization)

Materials Needed for Task Rotation and/or Task Rotation Menu

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-

MetaCognitive Discussion (Essential Questions):

(Whole Group)

Conceptual Perspectives:

Intelligent Behaviors:

Literary Perspective:

Student/Teacher Reflections:

Additional Support Materials:

Favorite Read-Alouds:

Finger Plays, Nursery Rhymes and Songs:

Video Clips:

Paintings & Prints:

APPENDIX

A

Additional Instructional Concept-Based Activities

Brainstorming:

- Imagine you are a polar bear. Discuss what's happening to your habitat due to Global Warming. Write a song about it....
- Construct a model of an ecosystem including organisms...
- Choose a form of music or art to represent the changes in weather,
- Vocabulary activities from the AG book. Look in AG handouts from 2007.
- Photoessay, Moviemaker, Power Point....
- Use podcasting to record a poem about the changes in weather due to global warming.
- Wiki?
- Experiments.... Change in water temperature affect plants? Algae? Coral- Use in conjunction with FOSS fifth grade kit.
- Science inquiry notebook
- Graphing- Best fit line, relationships, analyzing pie graphs
- Percentages
- Timeline

- Collect articles from newspapers, magazines... Create a bulletin board
- Discuss the concept of revolution. What is the “green revolution?” Relate to Beatles song.
- Hire Sponge Bob to come in as a guest speaker to discuss global warming... Rewrite an episode of Sponge Bob relating to global warming..
- Discuss cycles and patterns- math. Refer to p. 25
- Bulletin board- trace footprint. Discuss “carbon footprint.” Over the course of the unit, trim the outline of the print, thereby reducing the carbon footprint.
- Map of world...footprints on world. Draw the ecosystems on the world. Try to remember the continents.... Political and ecological map...Reference pg. 53. Where is extinction occurring? What are the factors?

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<p style="text-align: center;">Mastery Learner (A) Sensing- Thinking</p> <p>Map of world...footprints on world. Research where extinction is occurring. Draw the ecosystems with the footprints on the world. Label the continents, label animals that are extinct or endangered.... Political and ecological map...Reference pg. 53.</p> <p style="text-align: center;">V _ L _ S _ M _ B _ P _ I _ N _</p>	<p style="text-align: center;">Interpersonal Learner (B) Sensing-Thinking</p> <p>With your group design a ride including original music to teach the rest of the class about endangered animals, their location, and global warming.</p> <p style="text-align: center;">V _ L _ S _ M _ B _ P _ I _ N _</p>
<p style="text-align: center;">Understanding Learner (C) Intuitive-Thinking</p> <ul style="list-style-type: none"> • Using the information learned from the mastery rotation, what are the factors/patterns you observed with respect to endangered animals? • Discuss cycles and patterns- math. Refer to p. 25 Use any or all of the following: Graphing- Best fit line, relationships, analyzing pie graphs, percentages. <p>The Earth goes to the doctor’s office. She’s not feeling well. Write a dialog between the Earth and her physician.. Illustrate and label the diagnosis given to the doctor. Problems.... Ex: * What seems to be the problem? * I have a temperature....Discuss “blood pressure, (polluted waters), joint pain...</p>	<p style="text-align: center;">Self-Expressive Learner (D) Intuitive-Feeling</p> <ul style="list-style-type: none"> • You are an endangered animal. Write a letter to your government to convince them to help you in your plight for survival. • You are Spongebob. Write an episode about Spongebob if his habitat was affected by an overabundance of carbon in his environment. <p>Imagine you are a polar bear. Discuss what’s happening to your habitat due to Global Warming. Write a song about it....</p> <p style="text-align: center;">Choice 2</p> <p>Act out a scene from the <u>Wizard of Oz</u>. Reinterpret the role of the Wicked Witch as the</p>

