

**Project Bright IDEA 2: Interest Development Early Abilities**

**A Jacob Javits Gifted Education Program  
Funded by the US Department of Education  
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**Concept: Change**

**Topic: Global Warming**

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Grade Level: 6-8**

**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**  
**Publisher/Date – Orchard Books / 2007**

Concepts	Themes
<ul style="list-style-type: none"> <li>• <b>Change</b></li> <li>• <b>Relationships</b></li> <li>• <b>Environment</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Weather</b></li> <li>• <b>Extinction</b></li> <li>• <b>Community and Service</b></li> </ul>
Issues or Debates	Problems or Challenges
<ul style="list-style-type: none"> <li>• <b>Deforestation</b></li> <li>• <b>Desertification</b></li> <li>• <b>Energy</b></li> <li>• <b>Conservation</b></li> <li>• <b>Green House Gases</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>How can one person make a difference?</b></li> <li>• <b>How can we reduce the impact of global warming?</b></li> </ul>
Processes	Theories
<ul style="list-style-type: none"> <li>• <b>Pre-assessment</b></li> <li>• <b>Scientific Background</b></li> <li>• <b>Scientific Investigation</b></li> <li>• <b>Problem Solving</b></li> <li>• <b>Decision Making</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Global Warming is manifested by the greenhouse effect, CO<sub>2</sub>, temperature, reduction of carbon sponges, weather, and over consumption</b></li> <li>• <b>Global Warming is affecting plant and animal biomes across the earth at an alarming rate.</b></li> </ul>
Paradoxes	Assumptions or Perspectives
<ul style="list-style-type: none"> <li>• <b>Global Warming is the natural process, and the earth is not excessively heating.</b></li> <li>• <b>We are still coming out of the last ice age and the earth is still in fact cooling.</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Ninety-nine percent of the scientists in the global community today agree with the theories behind global warming.</b></li> <li>• <b>Scientists are using super computers and technology more now than ever before to confirm their hypothesis.</b></li> </ul>

# Concept: Change Topic: Global Warming

Suggested Text Selection(s): *The Down-to-Earth Guide to Global Warming*

## Look, Listen and Identify:

### Intelligent Behaviors

Story Focus – Theory of global warming broken down into four parts; **questioning and problem solving** are embedded throughout the four parts; with **metacognition** for always wondering how does this affect me; ending with creating **innovative solutions** through community and service learning.

**Student Activities** – vocabulary, content background, questioning and problem solving, metacognition, imagining and innovating, thinking responsibly for the greater good, communicating.

## NC Standards:

### Language Arts:

**Competency Goal 2: The learner will explore and analyze information from a variety of sources.**

#### Objectives

**2.01-** Explore informational materials that are read, heard, and/or viewed by:

- Monitoring comprehension for understanding of what is read, heard and/or viewed
- Studying the characteristics of informational works.
- Restating the summarizing information
- Determining the importance and accuracy of information
- Making connections between works, self and related topics / information.
- Comparing and/or contrasting information.
- Generating questions

**2.02-** Use multiple sources of print and non-print information in designing and developing informational materials (such as brochures, newsletter, and infomercials) through:

- Exploring a variety of sources from which information may be attained (e.g., books, Internet, electronic databases, CD-ROM).
- Distinguishing between primary and secondary sources.
- Analyzing the effects of the presentation and/or the accuracy of information.

**Competency Goal 4: The learner will use critical thinking skills and create criteria to evaluate print and non-print materials.**

#### Objectives

**4:01-** Determine the purpose of the author or creator by:

- Monitoring comprehension for understanding of what is read, heard and/or viewed.
- Exploring any bias, apparent or hidden messages, emotional factors, and/or propaganda techniques.
- Identifying and exploring the underlying assumptions of the author/creator.
- Analyzing the effects of author's craft on the reader/viewer/listener.

**4:02** – Analyze the communication and develop (with teacher assistance) and apply appropriate criteria to evaluate the quality of the communication by:

- Using knowledge of language structure and literary or media techniques.
- Drawing conclusions based on evidence, reasons, or relevant information.

- Considering the implications, consequences, or impact of those conclusions.
- 4:03** – Recognize and develop a stance of critic by:
- Considering alternative points of view or reasons.
  - Remaining fair-minded and open to other interpretations.
  - Constructing a critical response/review of a work/topic.

## **Mathematics:**

**Competency Goal 5: The learner will demonstrate an understanding of simple algebraic expressions.**

### **Objectives**

**5.01** – Simplify algebraic expressions and verify their results using the basic properties of rational numbers

- Identity
- Commutative
- Associative
- Distributive
- Order of operations

**5.02-** Use and evaluate algebraic expressions.

**5.03-** Solve simple(one – and two-step) equations or inequalities

## **Science:**

**Competency Goal 4:The learner will investigate the cycling of matter.**

### **Objectives**

**4:01-** Describe the flow of energy and matter in natural systems:

- Energy flows through ecosystems in one direction, from the sun through producers to consumers to decomposers.
- Matter is transferred from one organism to another and between organisms and their environments.
- Water, nitrogen, carbon dioxide, and oxygen are substances cycled between the living and non-living environments.

**4:02-** Evaluate the significant role of decomposers.

**4:03** – Examine evidence that green plants make food.

- Photosynthesis is a process carried on by green plants and other organisms containing chlorophyll.
- During photosynthesis, light energy is converted into stored energy which the plant, in turn, uses to carry out its life processes.

**4:04** – Evaluate the significance of photosynthesis to other organisms:

- The major source of atmospheric oxygen is photosynthesis.
- Carbon dioxide is removed from the atmosphere and oxygen is released during photosynthesis.
- Green plants are the producers of food that us used directly or indirectly by consumers.

**Competency Goal 6: The learner will conduct investigations and examine models and devices to build an understanding of the characteristics of energy transfer and/or transformation.**

**Objectives**

**6:07** – Analyze the Law of Conservation of Energy:

- Conclude that energy cannot be created or destroyed, but only changed from one form into another.
- Conclude that the amount of energy stays the same, although within the process some energy is always converted to heat.
- Some systems transform energy with less loss of heat than others.

**Competency Goal 7: The learner will conduct investigations and use technologies and information systems to build an understanding of population dynamics.**

**Objectives**

**7:02** – Investigate factors that determine the growth and survival of organisms including:

- Light.
- Temperature range.
- Mineral availability.
- Soil/rock type.
- Water.
- Energy.

**7:03**- Explain how changes in habitat may affect organisms

**7:04**- Evaluate data related to human population growth, along with problems and solutions:

- Waste disposal.
- Food Supplies.
- Resource availability
- Transportation.
- Socio-economic patterns.

**7:05**- Examine evidence that overpopulation by any species impacts the environment.

**7:06** – Investigate processes which, operating overlong periods of time, have resulted in the diversity of plant and animal life present today:

- Natural selection.
- Adaptation.

**Social Studies:**

**Competency Goal 1: The learner will use the five themes of geography and geographic tools to answer geographic questions and analyze geographic concepts.**

**Objectives**

**1:01** – Create maps, charts, databases, and models as tools to illustrate information about different people, places and regions in South America and Europe.

**1:02** – Generate, interpret, and manipulate information from tools such as maps, globes, charts, graphs, databases, and models to pose and answer questions about space and place, environment and

society, and spatial dynamics and connections.

**1:03-** Use tools such as maps, globes, graphs, charts, databases, models, and artifacts to compare data on different countries of South America and Europe and to identify patterns as well as similarities and differences among them.

**Competency Goal 2: The learner will assess the relationship between physical environment and cultural characteristics of selected societies and regions of South America and Europe.**

**Objectives**

**2:01** – Identify key physical characteristics such as landforms, water forms, and climate, and evaluate their influence on the development of cultures in selected South American and European regions.

**2:02-** Describe factors that influence changes in distribution patterns of population, resources, and climate in selected regions of South America and Europe and evaluate their impact on the environment.

**2:03** –Examine factors such as climate change, location of resources, and environmental challenges that influence human migration and assess their significance in the development of selected cultures in South America and Europe.

**Competency Goal 3: The learner will analyze the impact of interactions between humans and their physical environments in South America and Europe.**

**Objectives**

**3:01-** Identify ways in which people of selected areas in South America and Europe Have used, altered, and adapted to their environments in order to meet their needs, and evaluate the impact of their actions on development of cultures and regions.

**3:02-** Describe the environmental impact of regional activities such as deforestation, urbanization, and industrialization and evaluate their significance to the global community.

**3:03** – Examine the development and use of tools and technologies and assess their influence on the human ability to use, modify, or adapt to their environment.

**3:04-**Describe how physical processes such as erosions, earthquakes, and volcanoes have resulted in physical patterns on the earth's surface and analyze their effects on human activities.

**Competency Goal 4: The learner will identify significant patterns in the movement of people, goods and ideas over time and place in South America and Europe.**

**Objectives**

**4:01-** Describe the patterns of and motives for the migrations of people, and evaluate their impact on the political, economic, and social development of selected societies and regions.

**4:02** – Identify the main commodities of trade over time in selected areas of South America and Europe, and evaluate their significance for economic, political and social development of cultures and regions.

**4:03** – Examine key ethical ideas and values deriving from religious, artistic, political, economic, and educational traditions, as well as their diffusion over time, and assess their influence on the development of selected societies and regions in South America and Europe.

**Local Pacing Guide Timeline: Semester long enrichment interdisciplinary study**

**Thinking Skills Focus: Critically thinking skills under the umbrella topic of global warming.**

**Topic Focus: Global Warming**

**Concept Focus: Change**

**Overarching Generalizations:**

- Change can be positive or negative.
- Change can be evolutionary or revolutionary.
- Change is necessary for growth.
- Never underestimate the power of one person for positive change.

**More Complex Generalizations (Two or more concepts):**

- Change can be intentional or unintentional.
- Change that humans make create a domino effect.

**Directions for Teachers:**

Pre-assess students in order to show their growth.

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

Use vocabulary activities to teach text vocabulary prior to reading.

Use task rotation at the end of Part 1.

**Suggested Topics for Discussion:**

- Part I – The science of global warming and why it happens
  - A. Teach vocabulary
  - B. Show power point explaining the many contributing factors and global warming
  - C. Read Part I then hold a Socratic seminar
  - D. Then do the first task rotation.
- Part II – Effects of global warming on the weather.
  - A. Using data to prove global warming and its effect on weather
  - B. Research using National Weather Center for supporting data and the internet
  - C. Use the second task rotation along with this part of the book.
  - D. Also student can be taught how to design a survey and collect and report data
- Part III- Global warming's impact on plant and animal life.
  - A. Use the clip from CNN and Tom Brokaw's special about animal adaptation and extinction rates.
- Part IV- The many steps kids, along with parents, teachers, and friends, can take to help reverse this problem.
  - A. Use the six facets of understanding activities which demonstrate student understanding
  - B. Begin Community and Service Project.

**Suggested Vocabulary Words for Discussion:**

Albedo effect

Incandescent

Carbon cycle

Long-wave energy

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

Carbon footprint	Lumen
Carbon sink	Organism
Circumpolar	Permafrost
Clear-cutting	Polar Ice Cap
Equilibrium	Sediment
Fluorescent	Short wave energy
Fossil fuel	Stratification
Global warming	Symbiotic
Green	Water vapor
Greenhouse gas	

### **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: (See Dr. Dan Moirao’s “Cracking the Code” vocabulary lessons)**

- Discuss words and meanings
- Illustrations
- Role-playing of Words
- Vocabulary Whirl
- Synonym Chart

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

- What is a word?
- How does knowledge of words build a foundation? Why is foundation necessary?
- How does vocabulary establish a base line for learning?

### **Facets of Understanding**



<b>Facet 1 – EXPLANATION</b>
<p>Choose one of the following predictions:</p> <ul style="list-style-type: none"> <li>• What do you predict will happen if the global warming trend continues?</li> <li>• What do you predict if the warming trend does not continue?</li> </ul> <p>Justify the prediction by designing a brochure. Use the book as a reference.</p>
<b>Facet 2 – INTERPRETATION</b>
<p>What are the implications for the continuation of global warming? What do you speculate would happen? Design an international organization that would deal strictly with global warming. Through the design, speculate what problems the organization would encounter and resolve. If time allows, how would the organization enforce and monitor their policies. Illustrate a logo and a slogan for your international organization.</p>
<b>Facet 3 – APPLICATION</b>
<p>How can we make changes and adaptations here at school to make us greener? Make a “going green” chart listing and explaining the things we would do and how we could do them here at school. Explain how these things connect to the book. Include page numbers. (Sierra Club has an article on the top ten green school in the U.S.A.)</p>
<b>Facet 4 – PERSPECTIVE</b>
<p>Design your carbon footprint. Compare/contrast your carbon footprint o your parent’s footprint when they were your age, using a Robert Swartz graphic organizer.</p>
<b>Facet 5 – EMPATHY</b>
<p>Imagine you are a tropical rain forest and your resources are not being utilized and you are diminishing, or imagine you are a desert and you can’t stop growing. As a desert you engulf fresh water resource, communities, school and animals who cannot survive. Write a letter or email to a friend to express your feelings and explain what you think the future holds and why. Be specific and refer to the text.</p>
<b>Facet 6 – SELF-KNOWLEDGE</b>
<p>After reading this book, what are five things you and your family feel you can sacrifice that will help reduce the effects of global warming? What are five things you and your family feel you can not sacrifice or get along without? Design a contract for you and our family to sign and a personal pledge that you will personally commit to. Make a template of pledge and contract to share with the class so that others can follow your example.</p>

**Read:**

## Task Rotation Learning Activities

### Grade 6

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

<p style="text-align: center;"><b>Mastery Learner (A)</b> Sensing- Thinking</p> <p>In an encyclopedia style mini-book define five of the eleven subtopics in part 1 of the book, <u><i>The-Down to Earth Guide to Global Warming</i></u>. Be sure to include at least five of the vocabulary words. Which one of the five sub-topics is the #1 contributor to global warming? Explain. List the five subtopics in order of importance, explaining why you listed them in that particular order.</p> <p><b>HOM: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16</b></p> <p style="text-align: center;"><b>V _ L _ S _ M _ B _ P _ I _ N _</b></p>	<p style="text-align: center;"><b>Interpersonal Learner (B)</b> Sensing-Thinking</p> <p>Skit-in-a-bag Students will use information from five or eleven sub-topics along with five vocabulary words from part of the book, <i>The Down-to-Earth Guide to Global Warming</i>, to educate the class and personalize the story of global warming.</p> <p><b>HOM: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16</b></p> <p style="text-align: center;"><b>V _ L _ S _ M _ B _ P _ I _ N _</b></p>
<p style="text-align: center;"><b>Understanding Learner (C)</b> Intuitive-Thinking</p> <p>Students will prioritize a top ten list for the eleven sub-topics. Justify the reasons for this order, with one being the most important. Include five of the vocabulary words.</p> <p><b>HOM: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16</b></p> <p style="text-align: center;"><b>V _ L _ S _ M _ B _ P _ I _ N _</b></p>	<p style="text-align: center;"><b>Self-Expressive Learner (D)</b> Intuitive-Feeling</p> <p>After reading part 1 in the book, design, by writing and illustrating, a metaphor and analogy for each of the eleven sub-topics in part 1 of <u><i>The Down-to-Earth Guide to Global Warming</i></u>. What real life experiences show the concepts of global warming? How do the sub-topics relate to you?</p> <p><b>HOM: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16</b></p> <p style="text-align: center;"><b>V _ L _ S _ M _ B _ P _ I _ N _</b></p>

**Real World Connections With Products:**

- Organize, analyze, evaluate, discuss, identify, describe, explain, examine, problem-solving, decision making.

**Real World Applications:**

- Developer, construction worker, park ranger, lobbyist, scientist, politician, artist, environmental activist, teach, environmental lawyer

**Real World Terms:**

- Global, International, carbon, environment (See vocabulary list)

**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:**

Change

**Overarching Generalizations:**

- Change can be positive or negative
- Change can be evolutionary or revolutionary
  - Change is necessary for growth
- Planning for positive change can be a lot of hard work

**More Complex Generalizations (Two or more concepts):**

- Change can be local, national or international
- Change can be intentional or unintentional

As a developer or business owner, what intelligent behaviors would you use to justify your actions which would cause the environment harm? For example, draining the wetlands to build a subdivision.

**Essential Question**

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

- What is man's/women's responsibility to the environment? (self-knowledge)
- How would you feel if your carbon footprint was determined by your community? (Empathy/Community & Service)
- How will our carbon footprint define our legacy? (Empathy)

## **Materials Needed for Task Rotation and/or Task Rotation Menu**

- 8 ½ X 11 blank paper (can be colored)
- Markers / colored pencils / crayons- for mini-book
- Bag and eight props for skit-in-a-bag
- Lined notebook paper

## **MetaCognitive Discussion (Essential Questions):**

### **(Whole Group)**

### **Conceptual Perspectives:**

- 1) Is environment change always negative?
- 2) Who benefits or is harmed from global warming?
- 3) How can conservation change global warming?
- 4) Is the Green Revolution truly revolutionary or is it evolutionary?
- 5) Is global warming, “I don’t know” or is it “I don’t care?”
- 6) Can global warming be stopped?
- 7) What would it take to stop global warming?
- 8) Does changing attitudes about global warming change the approach?
- 9) How does attitude affect the outcomes to the problem?

### **Intelligent Behaviors:**

1. As humans, which intelligent behaviors could we adopt to help reduce the impact of global warming?
2. How would you demonstrate these behaviors on a daily basis?
3. What would this look like, feel like, taste like, sound like?
4. Which intelligent behaviors have not been discussed that do contribute to global warming?
5. How can changes in global warming be positive or negative?
6. Can change cause more change? Positive? Negative? Local? Global?
7. In what ways can we demonstrate the following intelligent behaviors?
  - a. Thinking flexibly
  - b. Applying past knowledge to new situations
  - c. Remaining open to continuous learning
  - d. Metacognition
  - e. Questioning and problem posing (Kindling)
  - f. Creating, Imagining, Innovating

**Literary Perspectives:**

1) Green Guide published by National Geographic, inspires all ages to care about our planet.

[WWW.THEGREENGUIDE.COM](http://WWW.THEGREENGUIDE.COM)

2) *Living Green*, a nine-volume series by WorldBook.

**Student/Teacher Reflections**

- **See Appendix for printer ready station directions.**

## Math Task Rotation Learning Activities

### Grade 6

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

<p style="text-align: center;"><b>Mastery Learner (A)</b> <b>Sensing- Thinking</b></p> <p>Students will use the National Weather Center on the Internet, and choose a city or location in the world. Starting in 1925, in increments of five (1925, 1930, 1935, etc.), record the average temperature for your choice of city or location on graph paper. Label X axis with the year, starting in 1925 and ending in 2025. Label The Y axis with degrees, starting with your lowest temperature at the bottom and twenty-five degrees above Your highest temperature on the top. What is the relationship between temperature and time? In your own words, do you agree or disagree with the author’s research on page 19. Name four reasons why you agree or disagree.</p> <p><b>HOM: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16</b></p> <p style="text-align: center;"><b>V _ L _ S _ M _ B _ P _ I _ N _</b></p>	<p style="text-align: center;"><b>Interpersonal Learner (B)</b> <b>Sensing-Thinking</b></p> <p>In pairs of two, develop two surveys. One group will design a survey to measure global warming awareness, and the other group will design a survey to measure preventative actions being taken. The survey should follow proper survey format with at least ten questions. No more than two should be short answer with only a maximum of three choices for the other questions. What is valuable about your survey? What is it you want to know and measure about peoples actions that impact global warming? Then survey the class and tally the results. Design a tally Sheet to do this. Graph results.</p> <p><b>HOM: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16</b></p> <p style="text-align: center;"><b>V _ L _ S _ M _ B _ P _ I _ N _</b></p>
<p style="text-align: center;"><b>Understanding Learner (C)</b> <b>Intuitive-Thinking</b></p> <p>By analyzing the graph on page 13, answer the following questions:</p> <ol style="list-style-type: none"> <li>1. Who is Keeling?</li> <li>2. What is the significance of the data shown on this page?</li> <li>3. Analyze the graph and explain why so many scientists fear Keeling’s theories are in fact correct.</li> </ol> <p>Now imagine it is two y ears after you have graduated From college and the year is 2020. What is the temperature if the global warming pattern remains unchanged? Graph the Keeling Curve and add on another fifteen years. What conclusions did you make from this activity.</p> <p><b>HOM: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16</b></p> <p style="text-align: center;"><b>V _ L _ S _ M _ B _ P _ I _ N _</b></p>	<p style="text-align: center;"><b>Self-Expressive Learner (D)</b> <b>Intuitive-Feeling</b></p> <p>The year is 2020. By creating a weather broadcast, you will hypothesize the weather issues of the day. A script and a five day weather forecast chart are required. What will be the new daily concerns due to the weather? How is average temperature going to be affected? Reference page numbers where you got your information. What will be the guidelines for air quality and determining UV Ray Safety?</p> <p><b>HOM: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16</b></p> <p style="text-align: center;"><b>V _ L _ S _ M _ B _ P _ I _ N _</b></p>

**Real World Connections With Products:**

Organize, analyze data, evaluate data, discuss data, identify, describe, explain, examine, problem solving, decision making, design and measure

**Real World Applications:**

Statistician, activist, environmentalist, scientist, teacher, attorney, politician, park ranger, journalist

**Real World Terms:**

Survey, broadcast, National Weather Center, Keeling Curve, guidelines

**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: Change****Overarching Generalizations:**

- Change can be positive or negative
- Change can be evolutionary or revolutionary
- Planning for positive change can be a lot of hard work

**More Complex Generalizations (Two or more concepts):**

- Change can be local, national, or international

**Essential Question(s):**

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

- What is mathematical about global warming?
- Why is mathematics vital in proving the case for global warming?
- How are math and science interwoven? Why does one need the other?

**Materials Needed for Task Rotation and/or Task Rotation Menu**

- Graph paper
- Mural paper – for broadcast
- Two computers

## **MetaCognitive Discussion (Essential Questions):**

### **(Whole Group)**

#### **Conceptual Perspectives:**

1. Is environmental change always negative?
2. Who benefits or is harmed from global warming?
3. How can conservation change global warming?
4. Is the Green Revolution truly revolutionary or is it evolutionary?
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#### **Intelligent Behaviors:**

1. As humans, which intelligent behaviors could we adopt to help reduce the impact of global warming?
2. How would you demonstrate these behaviors on a daily basis?
3. What would this book look like, feel like, taste like, sound like?
4. Which intelligent behaviors have not been discussed that do contribute to global warming?
5. How can changes in global warming be positive or negative?
6. Can change cause more change? Positive? Negative? Local? Global?
7. In what ways can we demonstrate the following intelligent behaviors?
  - a. Thinking flexibly
  - b. Applying past knowledge to new situations
  - c. Remaining open to continuous learning
  - d. Metacognition
  - e. Questioning and problem posing (Kindling)
  - f. Creating, Imagining, Innovating



**Literary Perspective:**

1. Green Guide published by National Geographic, Inspires all ages to care about our planet. [WWW.GREENGUIDE.COM](http://WWW.GREENGUIDE.COM)
2. *Living Green*, nine-volume series published by Worldbook, Inc.

**Student/Teacher Reflections**

**Concept: Change**

**Topic: Global Warming**

**Generalization(s): The scientific theory of the warming of the earth.**

**Essential Question(s): Why are words essential for learning?**

**Directions: Students must choose enough activities from the menu to earn 10 points. Points are earned left to right. All breakfast items are worth one point, lunch items are worth two points and the dinner items are worth three points. Directions for each activity can be found as a Blackline Master in Appendix D. Dig in, Gutten Apetite!!**

### **Task Rotation Menu**

<b>Level</b>	<b>Mastery</b>	<b>Understanding</b>	<b>Self-Expressive</b>	<b>Interpersonal</b>
<b>1</b> <b>Breakfast</b>	<b>WORD SPIDER</b>	<b>WORD BANKS</b>	<b>VISUALIZING VOCABULARY</b>	<b>GROUP THINK</b>
<b>2</b> <b>Lunch</b>	<b>WORD GLOSSARY</b>	<b>CONCEPT MAP</b>	<b>MULTI- SENSORY</b>	<b>VOCABULARY WHIRL</b>
<b>3</b> <b>Dinner</b>	<b>DESIGN CROSSWORD</b>	<b>FIST LIST</b>	<b>ETYMOLOGIES</b>	<b>THREE-TWO- ONE</b>

**Real World Connections With Products:**

Linguist, journalist, public speaking, public relations, writing, editing, broadcasting,

**Real World Applications:**

Vocabulary is skill based and cross-curricular.

**Real World Terms:**

All of the vocabulary included in this unit because this whole unit is non-fiction.

**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:**

- Change

**Overarching Generalizations:**

- Sometimes this relationship is taken for granted

**More Complex Generalizations (Two or more concepts):**

- Environment, Eco-systems and Cycles

**Essential Question:**

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

- Why are words essential for learning?
- Why do we take the things we need to survive for granted?
- Is it harder to maintain relationships than to create new ones? At some point is it essential to maintain them?

**Materials Needed for Task Rotation and/or Task Rotation Menu**

- Copies of graphic organizers
- Index cards
- Laminated index cards with prompts for vocabulary whirl
- Blank paper
- Markers & crayons

## MetaCognitive Discussion (Essential Questions):

### (Whole Group)

#### Conceptual Perspectives:

- Is environmental change always negative?
- Who benefits or is harmed from global warming?
- How can conservation change global warming?
- Is the Green Revolution truly revolutionary or is it evolutionary?
- Is global warming “I don’t know” or is it “I don’t care?”
- Can global warming be stopped? What would it take?
- Does changing attitudes about global warming change the approach? How does attitude affect the outcomes to the problem?

#### Intelligent Behaviors:

- As humans, which intelligent behaviors could we adopt to help reduce the impact of global warming?
- How would you demonstrate these behaviors on a daily basis?
- What would this book look like, feel like, taste like, sound like?
- Which intelligent behaviors have not been discussed that do contribute to global warming?
- How can changes in global warming be positive or negative?
- Can change cause more change? Positive? Negative? Local? Global?
- In what ways can we demonstrate the following intelligent behaviors?
  - Thinking flexibly
  - Applying past knowledge to new situations
  - Remaining open to continuous learning
  - Metacognition
  - Questioning and problem posing (Kindling)
  - Creating, Imagining, Innovating

#### Literary Perspective:

- Green Guide published by National Geographic, Inspires all ages to care about our planet. [WWW.GREENGUIDE.COM](http://WWW.GREENGUIDE.COM)
- *Living Green*, nine-volume series published by Worldbook, Inc.

**Student/Teacher Reflections:**

**Social Studies Student Reflections and Assessments  
Task Rotation Learning Experience  
Grade 6**

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

**Directions: This is the culminating task rotation which advocates for positive change.**

<p style="text-align: center;"><b>Mastery Learner (A)</b> Sensing- Thinking</p> <p>Define the problem of global warming in a well written summary from the three parts of the book.</p> <p><b>HOM: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16</b></p> <p style="text-align: center;"><b>V _ L _ S _ M _ B _ P _ I _ N _</b></p>	<p style="text-align: center;"><b>Interpersonal Learner (B)</b> Sensing-Thinking</p> <p>Design a class policy on what you would do about global warming.</p> <p><b>HOM: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16</b></p> <p style="text-align: center;"><b>V _ L _ S _ M _ B _ P _ I _ N _</b></p>
<p style="text-align: center;"><b>Understanding Learner (C)</b> Intuitive-Thinking</p> <p>Come up with a least two alternative class policies we can adopt if the original class policy doesn't work. Analyze the similarities and differences between these policies and the original class policy and the original class policy in a one page critique.</p> <p><b>HOM: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16</b></p> <p style="text-align: center;"><b>V _ L _ S _ M _ B _ P _ I _ N _</b></p>	<p style="text-align: center;"><b>Self-Expressive Learner (D)</b> Intuitive-Feeling</p> <p>What if our class policy really works? In what ways can we make a positive change in our community that is connected to global warming? It will be this groups responsibility to take the original class policy and devise steps to make it happen. You will design a plan to answer the question, "How can we creatively make a difference?"</p> <p><b>HOM: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16</b></p> <p style="text-align: center;"><b>V _ L _ S _ M _ B _ P _ I _ N _</b></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 Perspective:**

**Student/Teacher Reflections**



**Science Student Reflections and Assessments  
Task Rotation Learning Experience  
Grade 6**

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

**Directions: Group will choose one lab from the rotations. Students will be responsible for presenting the lab and the lab report to the class.**

<p align="center"><b>Mastery Learner (A)</b> <b>Sensing- Thinking</b></p> <p>Plant Lab: Provided with four young plants (A-D), students will be able to: 1) transplant the plant into a pot; 2) determine the different roles nutrients play in plant growth.</p> <p>The will correlate with page 8 when students put carbon ash in Plant A; For Plant B, students will use used coffee grounds, which correlates with page 93; Plant C will have vinegar, which exemplifies the consequences of acid rain and acidic ocean which correlates with page 59-61; Green or red food coloring will be used in the water for Plant D to demonstrate the absorption of harmful and beneficial nutrients.</p> <p><b>HOM: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16</b> <b>V _ L _ S _ M _ B _ P _ I _ N _</b></p>	<p align="center"><b>Interpersonal Learner (B)</b> <b>Sensing-Thinking</b></p> <p>Butterfly Lab: Provided with a kit, the students will be able to set up a classroom ant farm. Students will also be required to write up a lab report using the Blackline Masters related to this task menu.</p> <p>This activity correlates to page 36-51 in the book. The purpose of designing the classroom ant farm is to observe a living example of desertification.</p> <p><b>HOM: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16</b> <b>V _ L _ S _ M _ B _ P _ I _ N _</b></p>
<p align="center"><b>Understanding Learner (C)</b> <b>Intuitive-Thinking</b></p> <p>Water Cycle Lab: Students will simulate the water cycle answering the question why water changes states and how it is cyclic.</p> <p>Materials: clear plastic tub with lid, lamp with heat generating light bulb, ten cups of ice, and two gallon- ziploc bags of sand,.</p> <p>With the provided handout, students will be able to write out the lab. This activity corresponds with page 63 in the book.</p> <p><b>HOM: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16</b> <b>V _ L _ S _ M _ B _ P _ I _ N _</b></p>	<p align="center"><b>Self-Expressive Learner (D)</b> <b>Intuitive-Feeling</b></p> <p>Ant Farm Lab: Provided with a kit, the students will be able to set up a classroom ant farm. Students will also be required to write up a lab report using the Blackline Masters related to this task menu.</p> <p>This activity correlates to page 36-51 in the book. The purpose of designing the classroom ant farm is to observe a living example of desertification.</p> <p><b>HOM: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16</b> <b>V _ L _ S _ M _ B _ P _ I _ N _</b></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:**

## Teacher Reflections

### Literary Selection

**Date**

**School**

**Grade**

1. What were the strengths of the task rotations and/or other activities?
2. How did the task rotations and/or activities reveal students' Intelligent Behaviors? Please discuss how each Intelligent Behavior manifested it self.
3. What would you change or add the next time you taught this lesson?
4. What opportunities for growth does the resource unit have?
5. What were "ah ha's?" for the students? For teachers?

### **"Additional Comments**

# **APPENDIX**

## **A**

### **Additional Instructional Concept-Based Activities**

# **APPENDIX**

## **D**

### **BLACKLINE MASTERS**

### **FOR TASK ROTATIONS MENUS**

Name \_\_\_\_\_ Date \_\_\_\_\_

### Pre-Assessment Global Warming

EQ – What do we already know about Global Warming and the state of the environment?

Define the following words you already know in your own words.

1. Albedo effect
2. Incandescent
3. Carbon cycle
4. Long-wave energy
5. Carbon footprint
6. Lumen
7. Carbon sink
8. Organism
9. Circumpolar
10. Permafrost
11. Clear-cutting
12. Polar Ice Cap
13. Equilibrium
14. Sediment
15. Fluorescent
16. Short wave energy
17. Fossil fuel
18. Stratification
19. Global warming



20. Symbiotic
21. Water vapor
22. Greenhouse gas

Name \_\_\_\_\_

Date \_\_\_\_\_

CHAPTER 1: Vocabulary – Look these up after finishing pre-test:

1. Global Warming
2. Green House Gases
3. Fossil Fuels
4. Keeling Curve
5. Circumpolar (Keep in mind wind currents directly effect ocean currents)
6. Albedo Effect
7. Permafrost
8. Clear Cutting
9. Carbon Sink
10. Clear Cutting
11. Equilibrium
12. Stratification
13. Carbon footprint
  - Why do you think the first set of rotations focuses on language arts and vocabulary?
  - What do you think the second set of rotations will focus on? Answer: Math
  - What do you think the third set of rotations will focus on? Answer: Science Labs
  - What do you think the last set of rotations will deal with?  
Answer: Humanities and Community Service

**Mastery Learner (A)**  
**Sensing- Thinking**

In an encyclopedia style mini-book define five of the eleven subtopics in part 1 of the book, *The-Down to Earth Guide to Global Warming*. Be sure to include at least five of the vocabulary words.

- Which one of the five sub-topics is the #1 contributor to global warming? Explain.
- List the five subtopics in order of importance, explaining why you listed them in that particular order.

**V \_ L \_ S \_ M \_ B \_ P \_ I \_ N \_**

- See mini book sample to make sure you fold paper properly. Help each other fold your papers.

**Understanding Learner (C)**  
**Intuitive-Thinking**

Students will prioritize a top ten list for the eleven sub-topics. Make sure you justify (explain) the reasons for this order, with one being the most important. Include five of the vocabulary words. One large poster per group, please make sure you write all of your names on your work. This work will be displayed for Winter Festival make sure your work is neat and your best effort.

**V \_ L \_ S \_ M \_ B \_ P \_ I \_ N \_**

**Interpersonal Learner (B)**  
**Sensing-Thinking**

Directions: Skit-in-a-bag

Students will use information from five or eleven sub-topics along with at least five vocabulary words from part of the book, *The Down-to-Earth Guide to Global Warming*, to educate the class and personalize the story of global warming.

- Each student must record their copy of the script their groups designs. This way all students in the group will know who says what when.

V \_ L \_ S \_ M \_ B \_ P \_ I \_ N \_

**SAMPLE SCRIPT**

Characters:

(NAMES, ROLES, PURPOSE)

A. \_\_\_\_\_

B. \_\_\_\_\_

C. \_\_\_\_\_

D. \_\_\_\_\_

E. \_\_\_\_\_

F. \_\_\_\_\_

Essential Question for the skit: \_\_\_\_\_

\_\_\_\_\_

**The Script:**

(Name) \_\_\_\_\_ - (States) \_\_\_\_\_

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(Name) \_\_\_\_\_ - (States) \_\_\_\_\_

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(Name) \_\_\_\_\_ - (States) \_\_\_\_\_

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(Name) \_\_\_\_\_ - (States) \_\_\_\_\_

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(Name) \_\_\_\_\_ - (States) \_\_\_\_\_

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(Name) \_\_\_\_\_ - (States) \_\_\_\_\_

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(Name) \_\_\_\_\_ - (States) \_\_\_\_\_

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(Name) \_\_\_\_\_ - (States) \_\_\_\_\_

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(Name) \_\_\_\_\_ - (States) \_\_\_\_\_

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(Name) \_\_\_\_\_ - (States) \_\_\_\_\_

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(Name) \_\_\_\_\_ - (States) \_\_\_\_\_

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**Self-Expressive Learner (D)**  
**Intuitive-Feeling**

After reading part 1 in the book, design, by writing and illustrating, a metaphor and analogy for each of the eleven sub-topics in part 1 of *The Down-to-Earth Guide to Global Warming*.  
What real life experiences show the concepts of global warming? How do the sub-topics relate to you?

**V \_ L \_ S \_ M \_ B \_ P \_ I \_ N \_**

THIS WILL BE COMPLETED IN PAIRS OF TWO ON THE COMPUTER.

**EXAMPLE:**

SUBTOPIC:	ANALOGY/METAPHORE
1.	
2.	
3.	

Steps:

1. Insert table into Word Document. (2 Columns, 11 Rows)
2. Label Table at the Top of the Table
3. Use the text to help you
4. Use [www.dictionary.com](http://www.dictionary.com) to define what an analogy and metaphor are the design your own leave room for you and your partner to draw your illustrations.
5. Print when finished then draw your illustrations.
6. If you do not finish save your work.



Name \_\_\_\_\_ Date \_\_\_\_\_

**Guiding Reading Questions**  
**Chapter/ Part II “Weird, Wacky Weather”**

1. True / False Global warming causes hurricanes.
2. What is the highest category for a hurricane? \_\_\_\_\_
3. What is the connection between global warming and hurricanes? \_\_\_\_\_  
\_\_\_\_\_
4. What does it mean to be flooded? \_\_\_\_\_  
\_\_\_\_\_
5. How does global warming effect rainfall? \_\_\_\_\_  
\_\_\_\_\_
6. Page 37, explain why having more water vapor in the air is a problem? \_\_\_\_\_  
\_\_\_\_\_
7. According to “A Thirsty Planet” what will trigger wars in the future? \_\_\_\_\_
8. Why is it a big deal that more rain than snow is now falling on mountain tops?  
\_\_\_\_\_  
\_\_\_\_\_
9. According to the book, how did Sudan used to receive its rainfall? \_\_\_\_\_
10. Why is Sudan having severe droughts? \_\_\_\_\_
11. Where is Darfur? \_\_\_\_\_
12. Why do you think that maybe Darfur’s genocide could be linked to global warming?  
Explain. \_\_\_\_\_  
\_\_\_\_\_

13. How is global warming effecting heat waves? \_\_\_\_\_

14. Why do you think the authors mention beach erosion? \_\_\_\_\_

15. Explain three ways global warming is effecting National Parks in the United States.

A. \_\_\_\_\_

B. \_\_\_\_\_

C. \_\_\_\_\_

16. What are two ways global warming is effecting our everyday lives? \_\_\_\_\_

\_\_\_\_\_

Define the following terms:

17. Water Vapor

18. Flood

19. Drought

20. Hurricane

Name \_\_\_\_\_ Date \_\_\_\_\_

**Guided Reading Questions**  
**Part III/ Chapter 3**  
**“Extinction Stinks”**

1. Explain the catch 22 created by global warming and how this impacts animals?  
Hint: Read all of page 52 first.

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2. Did you think that there were as many extinction hot spots as there are? \_\_\_\_\_

3. What do they mean by hot spot? \_\_\_\_\_

4. What do you notice about North America and Russia on the map? \_\_\_\_\_

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5. How do the lack of hot spots in these countries effect government policies?

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6. How is global warming impacting the Arctic Food Web? \_\_\_\_\_

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7. What is a bleaching event? (Who is this effecting?) \_\_\_\_\_

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8. What is going on with butterflies? \_\_\_\_\_

9. What is happening to the Red Squirrel? \_\_\_\_\_

10. How many of the worlds amphibians are at risk? \_\_\_\_\_ Why? \_\_\_\_\_

Name \_\_\_\_\_ Date \_\_\_\_\_

## **Lab Report: Applying the Scientific Method**

1. List your groups materials used for your lab experiment: \_\_\_\_\_

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2. What do you have to do for your lab and selected rotation? \_\_\_\_\_

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3. What is the problem you are investigating? \_\_\_\_\_

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4. What do you predict will happen in your lab? \_\_\_\_\_

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5. Test your hypothesis. (What actually happened?) \_\_\_\_\_

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6. Record you data here.

7. Analyze your data. \_\_\_\_\_

8. What conclusions can you draw from participating in this lab? \_\_\_\_\_

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9. How will you present your lab? \_\_\_\_\_

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Creative Ideas? \_\_\_\_\_

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10. Presentation

