UNIT: **Building a Relationship with Earth** TIME FRAME: **1 to 2 weeks** TEACHER: **Jenny Conklin-Frank, E1B Coordinator Exemplar**

Unit Summary and Rationale: *(Outlines the components of the unit and the reasoning for their inclusion)*

The focus of this learning experience is to provide students with an opportunity to investigates various relationships and factors that influence the environment. Students will develop a deep understanding of the connectedness between human actions and the environment. Using a variety of texts, hands-on experiments, and the construction of a micro-habitat, students will investigate first-hand the relationships and delicate balance between living and non-living things.

Unit Connection College and Career Ready Descriptions: *Teachers will select at least one of the following lenses to act as the overlay for the unit. These are the descriptors that must be included to ensure the unit is fully aligned to the CCLS and relevant to the college and career ready student.*

☑ Students will demonstrate independence.
☑ Students will value evidence.
☐ Students will critique as well as comprehend.
☑ Students will develop an understanding of other perspectives and cultures.
☑ Students will build strong content knowledge.
☑ Students will respond to the varying demands of audience, task, and discipline.
☑ Students will use technology and digital media strategically and capably.

Unit Standards: *Teachers should list the standards to be addressed within the unit.*

Content

7.1a A **population consists of all individuals of a species** that are found together **at a given place and time**.

7.1c In all environments, **organisms interact with one another** in many ways.

7.1e The environment may contain dangerous levels of substances (**pollutants) that are harmful to organisms**.

7.2a In ecosystems, **balance is the result of interactions** between community members and their environment.

7.2b The **environment may be altered through the activities of organisms**. Alterations are sometimes abrupt.

7.2c **Overpopulation** by any species **impacts the environment** due to the increased use of resources.

7.2d Since the Industrial Revolution, **human activities have resulted in major pollution of air, water, and soil**

NOTE: content-specific vocabulary (Tier 3), scientific language (Tier 2), **essential content**

Reading

KEY IDEAS AND DETAILS

1. Cite specific textual evidence to support analysis of science and technical texts.
2. Determine the central ideas or information of a text; provide an accurate summary of the text distinct from prior knowledge and opinions.
3. Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

CRAFT AND STRUCTURE

4. Determine meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

INTEGRATION OF KNOWLEDGE AND IDEAS

8. Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
9. Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

Writing

1. Write arguments focused on *discipline-specific content*.
   a. Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.
   b. Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.
   c. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.
   d. Establish and maintain a formal style.
   e. Provide a concluding statement or section that follows from and supports the argument presented.

Essential Questions:

Q1: How does the interaction between living and non-living things influence organisms within an environment?

Q2: How have human activities impacted the environment?

Big Ideas:

- populations consist of a variety of organism interacting at a given place and time
- organisms depend on each other in many ways
- environments consist of living and non-living things interacting
- human activity impacts the natural environment, most often in a negative way
- investigating micro-habitats gives scientists a better understanding of the global world (macro-level)

Learning Tasks: *Teachers list the various tasks students will engage in throughout the unit.*

Reading Tasks

TASK #1: *Mother Earth,* Poem by Denise Tansley

In this activity, learners will be introduced to the concept of human impact on the environment using a poem to activate schema and build empathy. Students will

1. conduct a first read independently [Bell work - 5 min]
2. re-**read with purpose using a highlighting strategy (F = fact, O = opinion)** to distinguish between fact and opinion [RI.8]
3. in cooperative learning groups, interpret key words and metaphors in the poem using **read around the text strategies** [RI.4] and determine the central idea of the poem [RI.2]
4. in whole class discussion, **incorporate sentence starters** to illustrate the central idea of the poem using specific evidence from the text [RI.1]

TASK #2: Building Academic Vocabulary

In this activity, learners will be introduced to content-specific vocabulary from the learning experience. Students will

1. in cooperative learning groups, be assigned one term (Tier 3 word) relevant to the concepts to be addressed in the learning experience [RI.4]
2. use the **Frayer Model** to create a poster the describes the meaning of the term using text, visual representation, and examples/non-examples [RI.4]
3. create a **vocabulary journal entry** by circulating around the room using a gallery walk and engaging in discussion [RI.4]

TASK #3: Mini-Experiments

In this activity, learners will reinforce concepts introduced through the first two learning tasks. Working in collaborative inquiry teams, students will be assigned to research a topic and conduct a corresponding 'mini-experiment' to learn more about various types of interactions between living and non-living, and the human impact on the environment. Students will

1. read the research published online at the Global Science Weebly (prepared in advance by teacher, http://www.globalscience.weebly.com) about their topic
2. compare and contrast the weight of the information gained from the informational texts, images, and experiment video using a **graphic organizer** [RI.9]
3. in teacher conference, explain verbally the multistep procedure for carrying out their mini-experiment [RI.3]
4. perform the experiments.

****Reading/Writing Strategies explicitly taught or reinforced**

Writing Tasks

TASK #4: Bottle Biology Experiments

In this activity, learners will apply their understanding of concepts and vocabulary related to learning experience's big ideas. Through experimental inquiry and design, students will create microcosms that simulate terrestrial and aquatic ecosystems. Using their knowledge gained in Task #3: Mini-Experiments, students will stress their micro-environments to observe and draw conclusions about the impact of various interactions within an ecosystem. Students will

1. build the Bottle Biology ecosystems according to specifications [RI.3]
2. develop a hypothesis using the ***If-then-because* strategy**, and conduct an experiment, based on the prior knowledge obtained from previous learning tasks, that tests one interaction between a) living-->living, b) living-->non-living, or c) non-living-->non-living [W.1a]
3. publish their experimental findings in their scientific journal using the **Scientific Investigation Write-up** format [W.1c-d]
   a. Introduce claim about the topic (hypothesis based on research) [W.1a]
   b. Materials & Procedures
   c. Data Collection, Tables & Graphs
   d. Data analysis to support claim using logical reasoning and accurate data from text and experimental data collection [W1.b]
   e. Provide a concluding statement or section that follows from and supports the argument presented [W1.e]

Assessments: *List types of assessments that will be used throughout the course of the unit.*

DIAGNOSTIC	FORMATIVE	SUMMATIVE
1. Pre-assessment [10-15 multiple choice questions] 2. Previewing & Questioning a. preview the lesson days before beginning the learning experience by asking questions about students' interests and/or experiences with the topic (i.e. students were asked to collect bottles for the Bottle Biology days before the unit at which time teacher could preview upcoming learning)	1. Anecdotal reading records based on reading comprehension and concept attainment using the following artifacts of learning: a. verbal responses during small/whole group discussions [Task #1] b. Frayer Model poster and reinforcement questioning related to academic vocabulary [Task #2] c. Graphic Organizer [Task #3] 2. Teacher-Student conferences 3. Student reflections on learning	1. Post-assessment [10-15 multiple choice questions] 2. Reading Reflection [Task #1] 3. Scientific Journal a. Vocabulary Journal Entry [Task #2] b. Investigation Write-Up [Task #4]

Text(s) Selections:

- *Mother Earth,* Poem by Denise Tansley [Literature]
- Online resources (text, video, images, diagrams) at Global Science Weebly [Informational]

Mother Earth

Posted by Denise Tansley

NOTES

Will no one stand up for me,

I am all things can't you see.

I give you air to breath, the life that feeds

I nourished you from birth.

Never once have I ask for anything, always a silent friend.

We are as one and one we are when will you ever learn,

to know when you are lonely that you are never alone.

For I walk with you in the shadows, through the dark and dim lit roads,

when the wind is light and the sun is bright, my beauty in you shines through.

How could you forsake and turn away from me when I still see,

my gardens burnt and taken away for the price of luxury.

My children starved and diseased in the name of a gene,

what price would it be to feed, to love and keep clean.

My heart of fire taken like a thief in the night, and you, you took it too,

to feed machines that take you around so fast and they say to the moon.

You will see in time to come the damage that has been done,

as you try and breathe the air once clean, if only you believed you would have won,

to bring out love from hearts of rock, would that be so hard to do.

The seeds that grow I do not create, the leaders and powers that should not dictate,

and so my tears will flow with pain and sorrow, for the friend I had.

When the light that is slowly diminishing from the sadness and anger in you,

we are as one and one we are, and so for me it will too.

NAME: _____ DATE: _____

TASK #1: Reading Reflection

1. Read the poem and underline words that relate to science.

2. In your own words, what do you think this poem is about?

3. Place a star ∗ beside the 2 lines in the poem that best explain what the poem is about (main idea)?

4. A good reader is able to summarize the main idea using text evidence. Based on your answers from Reflection #2 and #3, construct a response that begins with the following sentence starters:

I think that this poem is about

In the line

“_____”

the author describes

In the line

“_____”

the author describes

5. Place 2 star ∗ ∗ beside the line that you feel reflects the earth’s point of view. What do you think the earth is trying to say? What is the issue being addressed in the poem?

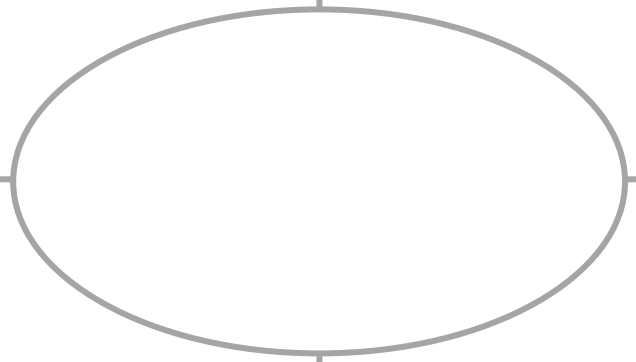
TASK #2: Building Academic Vocabulary

DATE: _____

NAME: _____

DESCRIPTION: Describe the term using your own words.

FACTS: Give at least 3 interesting facts about the term.



SYNONYM: What is it like?

ANTONYM: What is it not like?

TASK #2: Building Academic Vocabulary EXEMPLARS

TASK #3: Sample from Online Informational Text Source (teacher-developed)

visit The Global Science Weebly @ http://www.globalscience.weebly.com

How do the animals in the eco-bottle respond to their environment?

03/14/2011 0 Comments

IMPORTANT VOCABULARY

Crustaceans: a group of atoms (smallest unit)
Arthropod: a substance that produces color
Decomposer: green colored pigments that plants use to make their food
Decay: a process that plants use to make
Ethology: study of animal behavior

WHY IS THIS IMPORTANT?

1. To explore animal behavior.
2. To investigate how animals respond to environmental stimuli.
3. To understand the interconnectedness between animals and their environments.

BACKGROUND INFORMATION

Pill bugs are little bugs that are commonly found in dark, damp places like under logs and in basements. Although many people believe that pill bugs are insects, like ants and crickets. But in fact, pill bugs are crustaceans as are lobsters, shrimp, and crabs. Both insects and crustaceans are classified in a larger group called arthropods. These animals all have skeletons on the outside of their body called exoskeletons. Most crustaceans live in marine habitats, some live in fresh water habitats, and very few live on land.

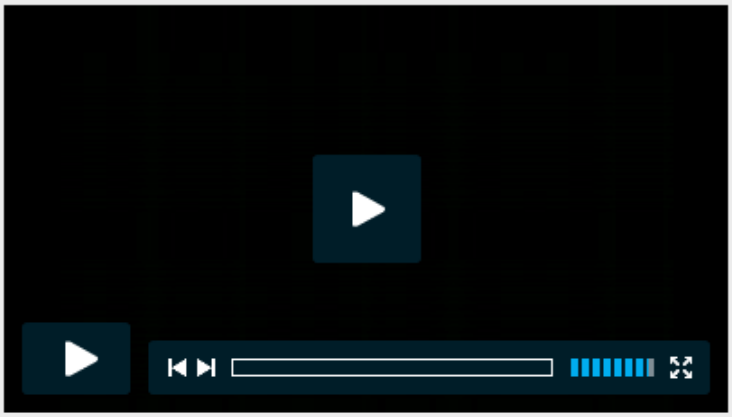
Pill bugs are interesting creatures to observe because they have unique behaviors. Some pill bugs will roll up in tiny little balls when they feel threatened, while others will run away. Pill bugs, also known as sow bugs, wood lice, potato bugs, and roly-pollies, are decomposers and feed off of decaying wood, leaves, and other vegetation.

Ethology is the study of animal behavior. Many behaviors involve movement of the animal within its environment. Favorable conditions are needed for an animal to survive in its environment. Because of this, an animal must search for the environment that fits its lifestyle.

PILL BUG BEHAVIOR EXPERIMENT

MATERIALS:

10 pill bugs
1 chamber (2 petri dishes with a door)
2 pieces of filter paper
tweezers
water & pippette



PROCEDURE:

1. Lay the filter table flat on the table and trace the perimeter of the chamber using a pencil or pen.
2. Cut the filter paper into two discs that will fit at the bottom of each of the chambers.
3. Place 5 pill bugs in a petri dish and allow to adjust to the new setting for a minute
4. Make general observations of their movement and actions for 2-3 minutes. Note things like where/how they move, how they interact with each other, and anything else you may see. Do not poke or push them around. We want to observe "natural" behavior.
5. List your observations in your Scientific Notebook.
6. Remove one of the filter papers and wet it with water using a pippette.
7. With the tweezers, carefully place 5 pill bugs into each side of the choice chamber (10 total).
8. Every minute (30 seconds for first observation) count and record the number of pill bugs in each chamber. Do this for 10 minutes, even if the bugs aren't moving.
9. Make notes of behaviors that you observe during the time intervals.
10. When you are finished, carefully return the pill bugs to their container.

Data

Time (min:sec)	# in Wet	# in Dry	Behavioral observations and other notes
0:00	5	5	
0:30			
1:00			
1:30			
2:00			
2:30			
3:00			
3:30			
4:00			
4:30			
5:00			
5:30			
6:00			