

Performance Expectation: 5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth’s resources and environment.

Practice: Obtaining, Evaluating, and Communicating Information

- Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to design a problem (5-ESS3-1)

DCI: ESS3.C Human Impacts on Earth Systems

- Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth’s resources and environment. (5-ESS3-1)

Cross-cutting Concept: Systems and System Models

- A system can be described in terms of its components and their interactions

Activities:

Estimated amount of time: 5 lunch periods (about 200 minutes)

Activity 1: KLEWS Chart*: How do humans and the Earth interact? How can we protect the Earth?

Objective: Students will be able to (SWBAT) describe what they know about how humans and Earth interact after discussing with their classmates.

Activity:

- First, I will show students pictures related to climate change (polar ice caps, greenhouse gases being emitted into the air). The students will complete a “See-Think-Wonder” for the pictures, discussing with a partner what they “See” in the pictures, what they “Think” about the pictures and what they “Wonder” about the pictures.
- Second, students will be given a KLEWS chart. On the chart, they will fill out the “K” portion about what they “know” about how humans and the Earth interact and how we can protect the Earth. After having a few minutes to write what they are individually thinking, students will share their ideas with the group.

Rationale: During my student interviews, I noticed that my students understood that there is an interaction between the Earth and humans; however, mostly only negative impacts were noted. In “And Action!” KLEWS charts were used to document student’s original thinking and their progression of learning throughout the unit. This not only will give students a place to keep their thoughts in one place, it will allow me to assess their

* KLEWS stands for: K- What do I know?, L- What am I learning?, E- What evidence do I have?, W-What am I still wondering?, S- What scientific principles/ vocabulary help explain the phenomena?

thinking as the unit continues. This first activity will be to mainly get student's thinking specifically about how humans and the Earth interact and what is being done to protect it. Bybee states in "Scientific and Engineering Practices in K-12 Classrooms" that Practice 8 includes engaging in discussion with peers. It is this discussion that will get students thinking about what we can do to protect the environment.

Activity 2: How do humans and the Earth interact?

Objective: SWBAT conduct research about human impact on the environment by reading various articles from the Time For Kids Earth Day website.

Activity:

- Using iPads, students will research information about how humans impact the environment. The Time for Kids Earth Day website has various articles for the students to look at.
- Students will be separated into 3 groups
 - Group 1: Human Impacts- Land
 - Group 2: Human Impacts- Oceans
 - Group 3: Human Impacts- Air
- The students will be looking to answer the following questions:
 - How are humans impacting the land/oceans/air?
 - How are humans protecting the land/oceans/air?
 - How are people sharing their ideas with others?
- Students will first research individually. Before beginning research, we will have a discussion about research (my students have researched many things so they are accustom to looking at multiple sources to make sure the information is valid.
- Students will be able to work on this collaboratively with their group members by each being responsible for one or two specific articles from this website. Then each student will be responsible for finding one more article from another website by using the search engine <http://www.kidrex.org>. Since there is not much time for research, I am refining the search portion. I typically would not do this, but we have limited time.
- Students will record their findings on their KLEWS chart.

Rationale: Students will add information to the "L" and "E" portions of their KLEW chart (charts will be collected at the end of the unit for assessment). According to "Exploring the Science Framework" when utilizing Practice 8, students must obtain information from various sources. Students and teacher will work together to discuss the validity of the research to determine whether or not we think the information we are finding supports our ideas. This will get my students thinking like scientists, obtaining and evaluating information to answer a question. Students will be researching a specific environment that is being impacted to get more of a deeper understanding of human impact instead of a superficial understanding. Working with groups will also allow students to discuss the information that they have obtained with their peers. They will be able to compare what they have learned to others to gain even more knowledge on their particular topic.

Activity 3: What are different communities doing to protect the environment?

Objective: SWBAT conduct research about what Schroeder Elementary is doing to help protect the environment and combine this information with what other communities are doing as well.

Activity:

- Lunch is split into two portions: lunch and recess. During the lunch portion, students will interview lunch staff, students in the lunchroom and other staff members what our school is doing to protect the environment (students will be given an interview sheet of questions the day before and will be reminded of the activity before they go to lunch).
- The second portion of this activity will have students combining the information they each have found on a piece of chart paper.
- Then, students will look at flyers/websites from various communities about what they are doing to help the environment.
- Students will compare and contrast what we are doing at Schroeder to other communities through discussion of what we have written down on the chart paper.

Rationale: This portion of the unit will get students out conducting their own research. Students will have to determine what we are doing here at Schroeder to help the environment. Having students conduct the investigation on their own about what Schroeder does for the environment will expose them to another form of obtaining information (“Exploring the Science Framework”). When students return from lunch, I will provide them with examples of what other communities are doing to help protect the environment. As a group, we will compare and contrast what Schroeder does with what other communities do to protect the Earth so we can begin thinking of a new plan. All of their information and notes on the discussion will be put on their KLEWS charts.

Activity 4: Sharing our Ideas Planning (May take a few days)

Objective: SWBAT create a Public Service Announcement for their peers that includes how humans are impacting the Earth and what we can do to protect the Earth.

Activity:

- Watch Humans and the Environment BrainPop Video
- Students will first discuss what they believe we could do at Schroeder to better protect the environment.
- Using a PSA Planning sheet, the students will answer each of the following questions:
 - How are humans impacting the environment? Are humans helping the environment, hurting it, or both?
 - How are other communities protecting the Earth?
 - How are we at Schroeder protecting the Earth?
 - What can we do as a school and as individuals to help protect the Earth?
- After completing the planning sheet, students will begin creating their PSAs for their classmates.

Rationale: In “And Action,” students created skits to demonstrate their knowledge of specific science content. I will have my students create a PSA discussing what they learning about how humans impact the Earth, what Schroder is doing for the environment and what else we can do to help the environment. Using a PSA planning sheet and rubric, students will be assessed on how they discuss how humans impact the Earth and what we can do to protect the Earth here in our own community. Since the PSA includes specific requirements, my students will only be able to discuss certain points.

Activity 5: Sharing our Ideas with our Peers

Objective: SWBAT show their PSA announcement to their Peers

Activity:

- Students will present their PSAs to the class.

Rationale: Now that their research has been conducted, my six students involved in my unit will share their ideas with the class. It is essential for them to communicate their ideas with their peers to demonstrate their understanding. Practice 8 has three parts are equally important. Once students find their information and evaluate it they must share what they have learned with others, like scientists and engineers. The cross-cutting concept that my students are demonstrating is that Earth is a system and humans interact with the Earth system in both positive and negative ways.

1. What do you want student’s to understand about the process of science through these activities?

My main goal is for my students to understand that when learning about science we are not just learning about how the Earth works. It is important for my students to understand that once we learn about the Earth we need to apply what we have learned to real world scenarios. Right now the world is changing. The impact of humans is becoming very clear and I want my students to understand how to obtain information about what is happening to the Earth and use the information that they obtain to come up with plans on how to protect it. I also want my students to understand that a main portion of science relates to the communication of ideas. In order for science to have meaning, the ideas need to be presented to others and solutions to problems need to be created.

2. What have you learned from interviews with your students that help you in planning these lessons?

During my interviews, my students had an understanding that humans are making an impact on the Earth. Most of the impacts discussed were negative impacts. When planning my lessons, I wanted to spend less time on the negative impacts and more on the positive ones that humans are making. I also noticed that my students had a hard time describing how to share their ideas. I would like my students to recognize that more than just books are used to share scientific ideas. By looking at articles, conducting research, and watching videos I hope to help me students begin to understand that the sharing of ideas is a major part of the scientific process.

3. How will you know what they understand from the lessons? What assessments (both embedded/formative and summative) will you use to assess students' understandings?

To know what my students understand from the lessons, I plan on utilizing a variety of assessments. Since I will only be working with six students, it will not be as challenging for me to informally assess each student's progress each day. I will be able to look at their KLEWS charts to see how their progress is coming along throughout the short unit. My main assessment will be their final PSA about human impact on the environment. Students will be given a rubric about what they must include in their PSAs.

References:

- Bell, P.; Bricker, L.; Tzou, C.; Lee, T.; Van Horne, K. (2012) *Exploring the Science Framework*. Science and Children Vol. 50.3 (Nov. 2012): 11-16
- Bybee, R. W. (2011) *Scientific and Engineering Practices in K-12 Classrooms: Understanding a Framework for K-12 Science Education*. Science and Children Vol. 49.4 (Dec. 2011): 10-16
- Haefner, L.; Hershberger, K.; Kur, J. (2013) *And Action! Using science skits to evaluate student's understanding of science concepts*. Science and Children. Vol. 51.3 (Nov. 2013): 56-63