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| **PLANNING** | | | | | | |
| Teacher | Subject | | | | | Unit |
| Mrs. Speaks-Walker | Science | | | | | Unit 2: Atmospheric Changes and Implications |
| Topic | Standards | | | | | Date |
| Under The Surface Implications | **4-ESS3-2/ MS-ESS3-2/** [RI.4.1](http://www.corestandards.org/ELA-Literacy/RI/4)/ [RH.6-8.7](http://www.corestandards.org/ELA-Literacy/RH/6-8/7/) | | | | |  |
| P4: Design lessons to meet learners’ unique needs | | | | | | |
| *What will students learn? What will students be able to do?* | | | | *How will the objective be measured?*  *What will it look like when it is successfully accomplished?* | | |
| Objective:  NATURAL HAZARDS IMPACTING SOCIETY Understanding natural hazards in the marine environment.   * Students will be able to explain how Earthly phenomena and events present altering effects on land and marine survival and sustainability. * Students will be able to explain how impacts of human investigation can potentially promote safety and adversely impact such natural outcomes. * Students will be able to construct personal arguments involving whether human interactions and investigation can enhance further evolution of organisms impacted by such events or hinder natural evolution. * Students will be able to identify areas which sea floor drilling can present deeper opportunities to gain insight to the complexities and extraordinary ecosystems thriving within such environments. * Students will be able to offer cross-referenced data and knowledge on how the effects of natural hazard events present to the initial ecosystems in contrast to the final interaction after the event is concluded. | | | | Daily Formative Assessment:  Students will be able to complete KWL chart towards offering understanding of components of lesson presented.  Students will be able to respond to open-ended questions in order to present comprehension to content presented.  Students will be able to compose personalized arguments of why seafloor drilling promotes diversity and expansion of organisms, or does this inhibit the healthy promotion of life for organisms. | | |
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| P1: Know Your Students | | | | | | |
| *How have students performed on this standard before? Consider past DFAs and pre-test. What background knowledge will you activate? What interests will you build on?* | | | | | | |
| *How are organisms able to flourish within underwater ecosystems and the environments surrounding these communities.* | | | | | | |
| P2: Set and track goals based on students’ performance levels | | | | P3: Develop standards-based units and long term plans | | |
| *How will you communicate yesterday’s data?*  *How will you track today’s data?* | | | | *For what part of the unit assessment does this lesson prepare students?* | | |
| *Students will be able to explain and describe the biological processes of Earth’s atmosphere and underwater ecosystems.* | | | | *Students will be able to explain the process of major systems and how this process impacts our ocean waters, atmosphere, and Earth’s processes.* | | |
| P5: Use and align resources strategically | | | | P7: Organize classroom space and materials | | |
| *What level is the text you are using?*  *How do your materials align to your objective?* | | | | *How will students be seated? Why?*  *What movement will take place during the lesson?* | | |
| *We are using grade-level text from grade 3 through grade 7 to meet the instructional levels of some students and expose others to their physical grade* | | | | *Students are sectioned into pairs. In the event group assignments are offered, two students can merge desks and chairs with another duo.* | | |
| T2: Present Content Clearly | | | | | | |
| *What are the key points and concepts?* | | | | *What is the academic vocabulary?* | | |
| **We will be able to think of personalized interpretations of natural events not generated by humans and compare multiple solutions to reduce the impacts of natural Earth processes on humans.**  **We will be able to develop personalized concepts based on Earth processes by identifying cause and effect presentations of Earth processes in regards to impact on humans and other organisms.**  **We will be able to analyze, identify, and interpret information presented based on natural hazards which can trigger and potentially cause future catastrophic events.**  **We will be able to offer information towards the development of technologies to mitigate effects of natural effects and events. Influence of Science, Engineering, and Technology on Society and the Natural World**   * **The uses of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. Thus technology use varies from region to region and over time**   We will be able to integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts in efforts to convey key aspects of reading and texts offered. | | | | “Where Wild Microbes Grow: The Search for Life Under the Seafloor”  Unearth Seafloor Conceal  Reveal Anchor Crew  Scuba gear Microbe Wire  Acquire Require Survival  Habitat Electric Marine  Surface Weird Oxygen  Air Longterm Scientific  Determination Collection Sample  Bought Brought Flourish  Molecular Billion Trillion  Isolation Exist Grassland  Desert Petroleum atmosphere  Chemosynthesis food chain cellular  Sediment volcanic lava  Magma biologist nutrient  Water temperature heat  Glacier glacial obstruct  Hydrothermal shallow trench  Identification species archaea  Bacteria food space  Groundwater algae plankton  Mineral metal filament | | |
| **CLASSROOM CULTURE** | | | | | | |
| T7: Implement routines to maximize instructional time | T8: Build a positive, learning-focused classroom culture | | | | T9: Reinforce positive behavior, redirect off-task behavior, and de-escalate challenging behavior | |
| *What routines and/or procedures will you use or teach?*  *How will you foster student leadership of these routines?* | *How will you communicate high expectations?*  *How will you foster student leadership?*  *How will you build relationships?* | | | | *When do you plan on giving directions and narrating behavior?*  *How will you plan for specific behaviors or students?* | |
| Opening:  Students come in, complete, copy HW, complete DoNow/ Warm-up, and begin Vocabulary Review.  More Practice: students will complete additional hands-on engagement and work on on-going projects. | Students will be expected to justify all of their responses and use the sentence starters for accountable talk in a math classroom when responding to their peers. Students will determine the validity of answers instead of relying on the teacher to tell them whether answers are right or wrong. | | | | Directions will be given before each transition, and narration will occur immediately after. | |
| **LESSON INTRODUCTION** | | | | | | |
| T1: Communicate standards-based lesson objectives | | | | | | |
| *How will you communicate the measures for today’s learning? How will you introduce the objective to students?* | | | | | | |
| ENGAGE  The ocean exerts a major influence on weather and climate by absorbing energy from the  sun, releasing it over time, and globally redistributing it through ocean currents. (MS-ESS2-6)    Video #1  Watching this video, we will briefly discuss should we even explore the ocean floor… “Introducing the International Ocean Discovery Program”--- question, should we look down there? <https://www.youtube.com/watch?v=0nydKlpZdIU>    Video #2  Should people dig on the Ocean Floor?  <https://www.youtube.com/watch?v=i9tsdAQBcfM>  Video #3  What is really there?  <https://www.youtube.com/watch?v=x2X6H1llkb0> | | | | | | |
| **INSTRUCTION** | | | | | | |
| T3: Use strategies and tasks to engage all students | | | | | | |
| *What is the purpose for this practice? What materials will you use to ensure a level of rigor aligned to your objective? How will the tasks be scaffolded or differentiated?*  *How will you help students build on foundational skills? How will you support students’ struggling and perseverance? What is the best method for students to practice?* | | | | | | |
| EXPLORE  Using a KWL Chart, have the students brainstorm what they know already  about the ocean floor and life here.  What do we believe floats in the ocean? What lives on the floor of the ocean? How can living things live within the ocean or in the deeper parts of the ocean?  Looking at page 18, students will engage in a discussion, just from the photos, on how these ecosystems have differences and similarities. Which of these ecosystems could go away and not make a difference? (rhetorical question)  How can one community/ ecosystem take priority over another? | | | | | | |
| T4: Use evidence –dependent questioning | | T5: Check for understanding and provide specific, academic feedback | | | | |
| *What questions will you ask that:*   * *move students’ thinking?* * *require evidence and explanation?* | | *What questions will you ask that:*   * *help you assess students’ understanding throughout?* * *give feedback regarding students’ understanding?*   *How will you adjust based on students’ understanding?* | | | | |
| How can people protect the ocean?  What do you think is on the ocean floor?  How can one ecosystem/ community be more important than another within our oceans and global waters? | | When we dig or search for things on the ocean floor, what happens?  Do you believe it is ok to dig along the ocean floor?  Thinking of an ecosystem above and below water, which are more important to life on Earth? Does one take priority over the other? | | | | |
| T2: Present Content Clearly | | | | | | |
| *What are the foundational concepts that you will present? What key points must students internalize? How will you model using academic vocabulary?*  *How will you model your engagement with texts, thinking, and implementation of skills? How will you present this content in multiple ways?* | | | | | | |
| EXPLAIN  <http://app.discoveryeducation.com/player/view/assetGuid/A47C6070-863F-46D8-AE87-06E1D7BACD70>  The ocean exerts a major influence on weather and climate by absorbing energy from the sun, releasing it over time, and  globally redistributing it through ocean currents.  How can this truly affect what happens on the ocean floor?  (MS-ESS2-6)  Generating Questions:  Explain to your students that you would like for them to  focus on the main topic of the virtual field trip: Traveling on the ocean floor, would this be for fun, investigation, or pure curiosity.  We will read the visual interpretative book, Where Wild Microbes Grow: The Search for Life Under the Seafloor. Upon reading pages 3-14, and acknowledging the glossary, we will discuss what the book is explaining about investigating life on and beyond the seafloor. Why do you believe these ecosystems and habitats are able to remain home to so many organisms/ animals and plants?  Why do you believe microbes are needed for life to thrive?  How can scientists, who are not doctors, help us understand life or large and small animals/ organisms (including microbes)?  **Vocabulary Review**  Complete during independent time and work on with homework. See below.  After discussing the video #3 and reading pages 18-21, participants will engage on discussions with the following questions:  How can organisms differ based on how far (deep) traveled in the ocean?  What are the possibilities that sources of heat can affect what organisms live in different areas of the ocean and on the ocean floor?  Why is the presence of underwater volcanoes and thermal (heat vents) important for life to sustain? | | | | | | |
| T4: Use evidence –dependent questioning | | T5: Check for understanding and provide specific, academic feedback | | | | |
| *What questions will you ask that:*   * *move students’ thinking?* * *require evidence and explanation?* | | *What questions will you ask that:*   * *help you assess students’ understanding throughout?* * *give feedback regarding students’ understanding?*   *How will you adjust based on students’ understanding?* | | | | |
| * Explain what makes Earth unique for life to survive, what makes this possible? * What does Earth have that some other planets and celestial (space embodied) places may not? * How can one habitat be different from another? * What is a microbe? Please explain.   How can microbes be totally important for life? | | * How is your habitat special from another organism’s / animal’s habitat? * What makes something a habitat? * What makes a place a livable habitat? * How can a habitat thrive under water? * Explain why/why not people be allowed to conduct research on the ocean floor?   Why is it important to understand the different species of organisms and how they are different? | | | | |
| T3: Use strategies and tasks to engage all students | | | | | | |
| *What is the purpose for this practice? What materials will you use to ensure a level of rigor aligned to your objective? How will the tasks be scaffolded or differentiated?*  *How will you help students build on foundational skills? How will you support students’ struggling and perseverance? What is the best method for students to practice?* | | | | | | |
| ELABORATE/ Evaluate:   1. Explain how these habitats and ecosystems are unique to our planet? 2. Why is it important to understand how so many cells and microbes can thrive in these places? 3. How are microbes important for life to grow in many places? 4. How are they comparing life on the ocean floor to other planets or ecosystems? 5. Explain how a microbe can change the lifestyle of an organism, species, or ecosystem. 6. What careers study implications or evolutions of microbes? 7. How can we study microbes without obstructing their natural habitats or areas of ecosystems? | | | | | | |
| T6: Facilitate student-student interaction and academic talk | | | | | | |
| *What are the structures for students’ collaboration? How will you keep them focused? How will students be grouped or partnered? What will be the topic of discussion, and how is that aligned to your objective? What academic vocabulary will students be held accountable to using?* | | | | | | |
| Do you believe people (scientists included) should investigate and dig in these underwater communities? | | | | | | |
| T4: Use evidence –dependent questioning | | T5: Check for understanding and provide specific, academic feedback | | | | |
| *What questions will you ask that:*   * *move students’ thinking?* * *require evidence and explanation?* | | *What questions will you ask that:*   * *help you assess students’ understanding throughout?* * *give feedback regarding students’ understanding?*   *How will you adjust based on students’ understanding?* | | | | |
| *Should you help or stop people from working on the ocean floor, how would you do this?* | | *Why is it ok or not good to dig along the ocean floor to investigate what is there?* | | | | |
| **LESSON REFLECTION** | | | | | | |
| RA1: Analyze student progress toward goals | | | | | | |
| *How did students perform? How many students mastered the objective? How many did not? What was your strength in practice? What was your problem of practice?* | | | | | | |
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| RA2: Modify instruction in response to data | | | RA3: Assess and refine classroom space and culture | | | |
| *What needs to change tomorrow?*  *What needs to change in the unit?*  *Will you reteach or spiral?*  *What interventions are necessary and for whom?* | | | *How will you adjust or refine your culture?*  *How will you modify your classroom space?* | | | |
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| RA4: Partner with students and families to reflect on students’ progress | | | | | | |
| *How will you communicate learning to parents?*  *How will you share progress tomorrow?*  *How will you assist students with analyzing and responding to data?* | | | | | | |
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Student Matrix Accommodations or Modifications

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Student | Scribe | Extended time/ Frequent Break | Graphic Organizer | Highlighter | Personal Space/ Reduced Distractions | Chunking | Crisis Intervention-- Embedded |
| KJ | X | FB | X | X | PS | X | X |
| LL | X | ET/FB |  | X | RD | X | X |
| EM |  | ET | X | X | RD |  | X |
|  |  |  |  |  |  |  |  |
| AB |  | FB |  | X |  |  | X |
|  |  |  |  |  |  |  |  |

Vocabulary Review

Unearth Seafloor Conceal Reveal Anchor Crew

Scuba gear Microbe Wire Acquire Require Survival

Habitat Electric Marine Surface Weird Oxygen

Air Longterm Scientific Determination Collection Sample

Bought Brought Flourish Molecular Billion Trillion

Isolation Exist Grassland Desert Petroleum atmosphere

Chemosynthesis food chain cellular Sediment volcanic lava

Magma biologist nutrient Water temperature heat

Glacier glacial obstruct Hydrothermal shallow trench

Complete the sentences using a working definition of words from the texts.

1. As the explorers seek to travel in the deep trench of the Atlantic Ocean, they must be certain not to obstruct the ecosystem within the shallow area of the bay.
2. As the ship sets its anchor upon the seafloor, the marine life must not be neglected in order to protect the habitat and preserve the foodchain which supplies food to all of the population.
3. The students were in pure amazement when they learned of the hydrothermal vents within the seafloor and how many underwater volcanic mountains are under the surface of the waters.
4. A major concern of ecologists when it comes to ocean sea floor exploration involves efforts not to unearth too much sediment which can contain any precious nutrient which will not be able to be replaced learning of its existence.
5. Studying marine life can reveal quite a bit of information of molecular sized organisms which live in isolation of the land-based world until their existence is brought to the surface of the water and to the world.
6. The primary distinction is lava flows outside of the volcano, while magma is the same liquid which flows within the mountain.
7. While a microbe presents a molecular size, it would only take nearly a few billion to present the size of a toddler.
8. Water can generate electric currents, conceal of micro-organisms floating in the elements, as well as provide hydration and nutrition to underwater grasslands with an assortment of grasses and plants.

Educator can create additional options to suit the needs of learners.

Students can expand personal ideas by responding to the following questions in short essay format:

* Should people dig on the Ocean Floor?
* *Should you help or stop people from working on the ocean floor, how would you do this?*
* How can one ecosystem/ community be more important than another within our oceans and global waters?
* *Why is it ok or not good to dig along the ocean floor to investigate what is there?*
* How can we study microbes without obstructing their natural habitats or areas of ecosystems?
* Explain what makes Earth unique for life to survive, what makes this possible?
* What does Earth have that some other planets and celestial (space embodied) places may not?
* How can one habitat be different from another?
* What is a microbe? Please explain.
* How is your habitat special from another organism’s / animal’s habitat?
* What makes something a habitat?
* What makes a place a livable habitat?
* How can a habitat thrive under water?
* Explain why/why not people be allowed to conduct research on the ocean floor?

KWL Chart—can be used for various projects

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| --- | --- | --- |
| Know | Want to Learn | Learned from Exercise |
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