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| PLANNING |
| Teacher | Subject | Unit |
| Mrs. Speaks-Walker | Science | Unit 2: Atmospheric Changes and Implications |
| Topic | Standards | Date |
| Under The Surface ImplicationsUncovering Earth’s Secrets: Science and Adventure on the JOIDES Resolution | **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 respond to open-ended questions to be able to present personalized ideas based on reading: Uncovering Earth’s Secrets: Science and Adventure on the JOIDES ResolutionStudents will be able to respond to reading prompts with personalized ideas and incorporating essential vocabulary.  |
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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 does the human/ mammal body function with internal/ external organs for daily activities?* |
| 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 how unearthing Earth’s seafloor habitats are worth the work presented.*  | *Students will be able to explain the process of how organisms flourish and thrive along seafloor ecosystems.*  |
| 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.   | “Uncovering Earth’s Secrets: Science and Adventure on the JOIDES Resolution” Curious shore boundUnderneath contribution tropicalSubmersible fossil drillpipePipeline descend seafloorMagma drillbit coreFossil instrumental radiationPlate tectonics ocean ridge mantleTsunami Mauna Loa basaltAsteroid paleontologist climate  |
| 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?* |
| ENGAGEThe ocean exerts a major influence on weather and climate byabsorbing energy from then sun, releasing it over time, and globallyredistributing it through ocean currents. (MS-ESS2-6)We will compare natural processes and phenomenon in comparison to implications of integrated works which can cause adverse effects of Earth’s makeup and presentation. Video #1Watching this video, we will briefly discuss should we even explore the ocean floor through drilling and other digging mechanisms?<https://www.youtube.com/watch?v=0nydKlpZdIU> Video #2Is it all Science?<https://www.youtube.com/watch?v=0Ftrq5qmUn0>Video #3It is all connected. What does this make you think about?<https://youtu.be/cduYq_C9pdQ>So many ideas to grasp from what is going on. Is it worth it, to you?<https://www.youtube.com/watch?v=c2q9uZZeWfI>  |
| 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 Venn Diagram, learners will begin to brainstorm what they know already about the ocean floor and life and what is aspects of natural progression. They will also take notes of how they believe manmade interference of these processes can alter, hinder, or remove such elements and organisms.  How do we believe the curiosity of humans can impede on life of known and unknown organisms within the oceans? What implications can this present on organisms, plants, and core Earth’s events which naturally take place? Earthquakes, tsunamis, landslides, mudslides, along with other events humans may not yet be exposed to. Interactions with technology can affect and alter the presentation of our marine life. Investigating the methods of employing technology and manmade items to dig and drill along the seaflooring, not man made digging sites. What could this mean?What are potential benefits of exploring oceans and ocean floors utilizing technology in lieu of human actions? ----- |
| 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 are benefits of using machines to dig along the ocean floor and not human endeavors?How can the drilling using machines naturally alter the ecosystems along seafloors?What are the technologies used and where do they employ these items? | When the processes to drill along the ocean floor takes place, how can this interact with elements under the water’s surface?How can these actions disrupt ecosystems in place over decades and centuries old?What are benefits of doing this?Thinking of an ecosystem above and below water, which are more important to life on Earth? Does one take priority over the other?Do you believe these drilling efforts can present, cause, or interfere with natural Earth events such as earthquakes, mudslides, or even cracks within the Earth’s outer mantle/ crust? |
| 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<https://bcps.discoveryeducation.com/learn/player/84d5ee09-b7fe-4257-8eee-0b2d1b82eca1>Deep Sea Drilling Project (MS-ESS2-6)In comparison to <https://www.youtube.com/watch?v=RLHMT097QzY>JOIDES Resolution, sailing for the Antarctic coast of Wilkes Land between January and March 2010. Our mission: exploring the climate history of Antarctica.Which of the two videos can you relate to most? Explain why these efforts are essential to scientific development and evolution or should these projects be halted in fear of interference towards natural processes within the oceans and life along the seafloors. Reading the pages of the book, learners will identify aspects of oceanic life being impacted from the endeavors to investigate and seek understanding of ecosystems below the water’s surface and ocean floor.  How can underwater volcanic eruptions cause adverse effects to the explorations of these scientists? When investigating core samples, what are some precautions and safety concerns which must be practiced at all times?If one comes across a new organism or species while investigating samples, what would be the best practice to follow?Once researching any new organisms or pieces of items from the ocean floor, should they be returned to the ocean floor or investigated further?While we understand that the inner core of the Earth is significantly deeper that most people can understand, how do you believe digging through the mantle and crust can impact natural Earth’s events such as earthquakes can be impacted? |
| 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?* |
| * As seafloor drilling persists, how can sediment and micro-organisms be interrupted?
* Scenario: while drilling along the seafloor, one of the drilling tools comes in contact with a relic skeleton which has been intact for centuries. Upon the underwater camera capturing this evidence, it is learned that part of the bone structure was compromised and separated from the remnants. What should happen after this? How can this concern advance? Should the advancement of the drilling resume? Explain.

While drilling along the seafloor, magnetic frequencies increase and ground tremors are recorded. Moments later, the area of drilling begins to witness deeper cracks with violent shakes begin to be recorded. What do you believe has caused such actions? Natural, of natural consequence, or totally triggered by investigative practices.   | When the processes to drill along the ocean floor takes place, how can this interact with elements under the water’s surface?How can these actions disrupt ecosystems in place over decades and centuries old?What are benefits of doing this?Thinking of an ecosystem above and below water, which are more important to life on Earth? Does one take priority over the other?Do you believe these drilling efforts can present, cause, or interfere with natural Earth events such as earthquakes, mudslides, or even cracks within the Earth’s outer mantle/ crust? |
| 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. How can alternate resources and tools be used to minimize impacts on ecosystems and work to minimize interference with natural Earth’s events?

 1. Thinking of an ecosystem above and below water, which are more important to life on Earth? Does one take priority over the other?
2. Do you believe these drilling efforts can present, cause, or interfere with natural Earth events such as earthquakes, mudslides, or even cracks within the Earth’s outer mantle/ crust?
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| 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?How can these efforts impact causations of earthquakes and triggered tsunamis?Thinking of an ecosystem above and below water, which are more important to life on Earth? Does one take priority over the other?Do you believe these drilling efforts can present, cause, or interfere with natural Earth events such as earthquakes, mudslides, or even cracks within the Earth’s outer mantle/ crust? |
| 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? Can this interfere with natural occurrences within the seafloor?* |
| 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 |
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Reading Response/ Discussion/ Open-ended response prompts

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

* How do we believe the curiosity of humans can impede on life of known and unknown organisms within the oceans?
* What implications can this present on organisms, plants, and core Earth’s events which naturally take place? Earthquakes, tsunamis, landslides, mudslides, along with other events humans may not yet be exposed to.
* What are potential benefits of exploring oceans and ocean floors utilizing technology in lieu of human actions?
* How can people protect the ocean?
* What are benefits of using machines to dig along the ocean floor and not human endeavors?
* How can the drilling using machines naturally alter the ecosystems along seafloors?
* What are the technologies used and where do they employ these items?
* When the processes to drill along the ocean floor takes place, how can this interact with elements under the water’s surface?
* How can these actions disrupt ecosystems in place over decades and centuries old?
* What are benefits of doing this?
* Explain why these efforts are essential to scientific development and evolution or should these projects be halted in fear of interference towards natural processes within the oceans and life along the seafloors
* As seafloor drilling persists, how can sediment and micro-organisms be interrupted?
* Scenario: while drilling along the seafloor, one of the drilling tools comes in contact with a relic skeleton which has been intact for centuries. Upon the underwater camera capturing this evidence, it is learned that part of the bone structure was compromised and separated from the remnants. What should happen after this? How can this concern advance? Should the advancement of the drilling resume? Explain.
* While drilling along the seafloor, magnetic frequencies increase and ground tremors are recorded. Moments later, the area of drilling begins to witness deeper cracks with violent shakes begin to be recorded. What do you believe has caused such actions? Natural, of natural consequence, or totally triggered by investigative practices.
* Explain how these habitats and ecosystems are unique to our planet?
* How can alternate resources and tools be used to minimize impacts on ecosystems and work to minimize interference with natural Earth’s events?

* Thinking of an ecosystem above and below water, which are more important to life on Earth? Does one take priority over the other?
* Do you believe these drilling efforts can present, cause, or interfere with natural Earth events such as earthquakes, mudslides, or even cracks within the Earth’s outer mantle/ crust?
* Once researching any new organisms or pieces of items from the ocean floor, should they be returned to the ocean floor or investigated further?
* While we understand that the inner core of the Earth is significantly deeper that most people can understand, how do you believe digging through the mantle and crust can impact natural Earth’s events such as earthquakes can be impacted?
* Can these investigations within underwater ecosystems be connected to potential life on other extra-terrestrial planets and celestial bodies?

KWL Chart—can be used for various projects

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| Know | Want to Learn | Learned from Exercise |
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Venn Diagrams