

**5E Lesson Plan: Oxybenzone, Climate Change, and Coral Reefs: Adapted from a Lesson by The National Oceanic and Atmospheric Administration**  
<https://portal.nnvl.noaa.gov/arcgis/apps/MapSeries/index.html?appid=138acf1bee62443fae7e8ab10e2e0266>

<b>Teacher:</b> Kim Wilson
<b>Date:</b> 11/25/2018
<b>Subject / grade level:</b> 3 <sup>rd</sup> Grade
<b>Materials:</b> Smart Board, Ipads, Student Worksheets 1-3 from <a href="https://coralreef.noaa.gov/education/coralfacts.html">https://coralreef.noaa.gov/education/coralfacts.html</a>
<b>NC SCOS Essential Standards and Clarifying Objectives:</b> 3-LS1-1 Patterns of change can be used to make predictions ESS3.B A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impact. RI.3.7 Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g. where, when, why, and how key events occur) MP.4 Model with mathematics
<b>Lesson objective(s):</b> Students will look at datasets from the NOAA: Coral Bleaching Maps and Coral Station Data
<b>Differentiation strategies to meet diverse learner needs:</b> The NOAA lesson and dataset exploration is geared toward middle school students. 3 <sup>rd</sup> grade students will be guided through these activities in a whole group as a scaffold.
<b>ENGAGEMENT</b> Students will watch a video on Coral Bleaching <a href="https://www.youtube.com/watch?v=zQEQtRkFMQ&amp;feature=youtu.be">https://www.youtube.com/watch?v=zQEQtRkFMQ&amp;feature=youtu.be</a> and will discuss some ideas about their hypotheses to solutions to the problem of coral bleaching. <i><b>Driving Questions: During this portion of our unit on the warming oceans, we are going to ask: what is causing the coral reefs to bleach? We are going to look at the datasets by the National Oceanic and Atmospheric Administration, and will ask, what solutions can scientists and the public make to solve the problem of coral bleaching?</b></i>
<b>EXPLORATION</b> Guide students through the exploration activities 1-3 from <a href="https://portal.nnvl.noaa.gov/arcgis/apps/MapSeries/index.html?appid=138acf1bee62443fae7e8ab10e2e0266">https://portal.nnvl.noaa.gov/arcgis/apps/MapSeries/index.html?appid=138acf1bee62443fae7e8ab10e2e0266</a>
<b>EXPLANATION</b> <ul style="list-style-type: none"> <li>Students will act as scientists and will monitor the health quality of a coral reef of their using real data worksheets from the NOAA. Students will choose which area to investigate and observe using satellite imagery from Google Underwater Earth: Phoenix Islands, Republic of Kiribati; Pago Pago, American Samoa; Lizard Island, Great Barrier Reef, Australia; Kahului Point, Maui, Hawaii.</li> </ul>
<b>ELABORATION</b> Video on solutions for scientists: <a href="https://oceantoday.noaa.gov/fullmoon-whatcanwedo-coral/welcome.html">https://oceantoday.noaa.gov/fullmoon-whatcanwedo-coral/welcome.html</a> Vocabulary: Coral Bleaching, Polyp, Zooxanthellae, Mutualism, Symbiosis, Degree Heating Weekly Maps Students will take notes on their findings in their science notebooks, and will complete worksheets 1-3 from <a href="https://portal.nnvl.noaa.gov/arcgis/apps/MapSeries/index.html?appid=138acf1bee62443fae7e8ab10e2e0266">https://portal.nnvl.noaa.gov/arcgis/apps/MapSeries/index.html?appid=138acf1bee62443fae7e8ab10e2e0266</a>

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**EVALUATION**

- Students should investigate coral reef locations and temperature ranges throughout the globe by reading a climate map. (worksheet 1)
- Students should analyze temperature data at the Great Barrier Reef and determine the bleach risk based on this 2017 data. (worksheet 2)
- Students should make observations at four given reefs and should determine if they are healthy, at-risk, or bleached. (worksheet 3)