

Ecology of Fear Unit Template *

Prepared by: Roy Bartnick School/Location: Chisholm Elementary School/ Enid, Oklahoma

Subject: Science Grade: 5-6 Unit Title: Sharks...a Critical Part of the Coral Reef

Time Needed: 5 class periods or one week

Unit Summary:
Sharks have a notorious reputation due to movies, news and social media. This lesson allows students to explore and understand the critical role that sharks play in maintaining the balance in a coral reef ecosystem.

Stage 1 Desired Results

<p>ESTABLISHED GOALS:</p> <p>G1: Students will be able to participate in an open discussion and give examples of facts and fiction in media about sharks.</p> <p>G2: Students will be able to define how sharks are part of the coral reef food web</p> <p>G3: Students will hypothesise what would happen to the coral reef ecosystem if sharks became extinct.</p> <p>G4: Students research and determine key causes for the decline in shark populations.</p> <p>G5: Students will create a project that will provide their data and research that will explain to the public facts about sharks and how sharks are important to the Earth's ecology.</p> <p>Next Generation Science Standards (NGS)</p> <p>5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment.</p> <p>LS2.A: Interdependent Relationships in Ecosystems</p> <p>LS2.B: Cycles of Matter and Energy Transfer in Ecosystems</p> <p>LS1.C: Organization for Matter and Energy Flow in Organisms</p> <p>MS-LS2-2. Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.</p> <p>MS-LS2-5. Evaluate competing design solutions for maintaining biodiversity and ecosystem services.</p> <p>LS2.A: Interdependent Relationships in Ecosystems</p> <p>LS2.C: Ecosystem Dynamics, Functioning, and Resilience</p> <p>LS4.D: Biodiversity and Humans</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2" style="text-align: center; background-color: #e0e0e0;"><i>Transfer</i></th> </tr> <tr> <td colspan="2" style="padding: 5px;"> <p><i>Students will be able to independently use their learning to...(real world purpose)</i></p> <p>T1: Recognize that sharks have been misrepresented by the media and that they are a critical part of the ocean's ecology.</p> <p>T2: Recognize that human interactions with sharks have caused a decline in shark populations causing secondary and tertiary effects on Earth's ecosystems.</p> <p>T3: Students will be able to apply current mathematical and science skills to understanding a real-world issue. Using current and historical data, students will gather and graph changing shark populations and attacks.</p> <p>T4: Communicate with science teams and experts.</p> </td> </tr> <tr> <th colspan="2" style="text-align: center; background-color: #e0e0e0;"><i>Meaning</i></th> </tr> <tr> <td style="width: 50%; padding: 5px; vertical-align: top;"> <p>UNDERSTANDINGS</p> <p><i>Students will understand that...</i></p> <p>U1: ... Sharks are a critical part of the coral reef ecosystem.</p> <p>U2: ...Human interaction has an effect on shark populations</p> <p>U3: ... They rely on the ocean ecosystem for survival even if they do not live by it</p> <p>U4:... Media creates a false concept of sharks and their behavior</p> </td> <td style="width: 50%; padding: 5px; vertical-align: top;"> <p>ESSENTIAL QUESTIONS</p> <p>Q1: Why are sharks critical to coral reef survival?</p> <p>Q2: How are human interactions affecting shark populations?</p> <p>Q3: How does the media affect people's perceptions of sharks?</p> <p>Q4: What is ocean conservation and environmental stewardship?</p> <p>Q4: How can individuals who do not live by the ocean also help steward the ocean environment?</p> </td> </tr> </table>	<i>Transfer</i>		<p><i>Students will be able to independently use their learning to...(real world purpose)</i></p> <p>T1: Recognize that sharks have been misrepresented by the media and that they are a critical part of the ocean's ecology.</p> <p>T2: Recognize that human interactions with sharks have caused a decline in shark populations causing secondary and tertiary effects on Earth's ecosystems.</p> <p>T3: Students will be able to apply current mathematical and science skills to understanding a real-world issue. Using current and historical data, students will gather and graph changing shark populations and attacks.</p> <p>T4: Communicate with science teams and experts.</p>		<i>Meaning</i>		<p>UNDERSTANDINGS</p> <p><i>Students will understand that...</i></p> <p>U1: ... Sharks are a critical part of the coral reef ecosystem.</p> <p>U2: ...Human interaction has an effect on shark populations</p> <p>U3: ... They rely on the ocean ecosystem for survival even if they do not live by it</p> <p>U4:... Media creates a false concept of sharks and their behavior</p>	<p>ESSENTIAL QUESTIONS</p> <p>Q1: Why are sharks critical to coral reef survival?</p> <p>Q2: How are human interactions affecting shark populations?</p> <p>Q3: How does the media affect people's perceptions of sharks?</p> <p>Q4: What is ocean conservation and environmental stewardship?</p> <p>Q4: How can individuals who do not live by the ocean also help steward the ocean environment?</p>
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<p>GLOBAL COMPETENCIES:</p> <ol style="list-style-type: none"> 1. Investigate the world 2. Weigh different perspectives 3. Communicate idea 4. Take action <p>Resources:</p> <p>Sharks</p> <p>https://globalfinprint.org/tag/fiu/</p> <p>https://globalfinprint.org/</p> <p>http://blog.conservation.org/2013/08/5-things-you-didnt-know-sharks-do-for-you/</p> <p>http://eu.oceana.org/en/importance-sharks</p> <p>https://www.seashepherd.org.au/apex-harmony/overview/shark-importance.html</p> <p>http://www.sharksavers.org/en/education/the-value-of-sharks/sharks-role-in-the-ocean/</p> <p>http://oceana.org/sites/default/files/reports/Predators_as_Prey_FINAL_FINAL_1.pdf</p> <p>Human interaction</p> <p>http://news.fiu.edu/2013/03/100millionsharks/52935</p> <p>http://www.sharks.org/blogs/science-blog/sharks-in-decline</p> <p>http://www.coml.org/discoveries/trends/shark_decline_effects</p>		
	Acquisition	
	<p><i>Students will know... (Content)</i></p> <p>K1: How to select, research, and present a research project on the importance of sharks to the ocean and coral reef.</p> <p>K2: How the ocean and coral reef's health is important to the Earth and areas away from the ocean.</p> <p>K3: How media plays a role in how people understand sharks, ocean ecology, and coral reef health.</p>	<p><i>Students will be able to... (Skills)</i></p> <p>S1: ...Conduct research and take a position on shark's place in the ocean and coral reef ecosystems.</p> <p>S2: Identify fact from fiction in media sources.</p> <p>S3: Use various technology to communicate, research, and present information</p>

<http://www.southernfriedscience.com/how-severe-are-shark-population-decreases-and-how-do-we-know/>

<http://blog.nature.org/conservancy/2012/08/13/sharks-the-tragedy-of-global-decimation/>

<http://www.pbs.org/emptyoceans/educators/activities/sharks-in-decline.html>

<http://science.sciencemag.org/content/315/5820/1846>

<http://icesjms.oxfordjournals.org/content/57/3/476.short>

[http://www.cell.com/trends/ecology-evolution/abstract/S0169-5347\(08\)00057-8?_returnURL=http%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS0169534708000578%3Fshowall%3Dtrue&cc=y=](http://www.cell.com/trends/ecology-evolution/abstract/S0169-5347(08)00057-8?_returnURL=http%3A%2F%2Flinkinghub.elsevier.com%2Fretrieve%2Fpii%2FS0169534708000578%3Fshowall%3Dtrue&cc=y=)

<http://discoverykids.com/category/sharks/>

Media Portrayal

http://www.sharkproject.org/haiothek/index_e.php?site=angst_4

<http://www.discovery.com/tv-shows/shark-week/>

<http://www.sharksavers.org/en/education/sharks-and-people/shark-attack-media-hype-or-shark-truth/>

<http://marinesciencetoday.com/2012/11/04/sharks-suffer-from-bad-public-image/>

<http://onlinelibrary.wiley.com/doi/10.1111/j.1523-1739.2012.01952.x/abstract>

Stage 2 - Evidence

Assessment	Evaluation Criteria (Learning Target or Student Will Be Able To)
<p>Assessments FOR Learning: (ex: kwl chart, exit ticket, observation, draft, rehearsal)</p> <p>AFL1: Research and analyze shark roles in ecosystem with appropriate texts and websites.</p> <p>AFL2: Create a Venn Diagram that reflects pros and cons of people’s thoughts and concerns about sharks.</p> <p>AFL3: Organize and use evidence from interviews with scientists and other shark experts using Skype and Google Hangouts to support argument.</p> <p>AFL4: Students will share websites used to support or refute climate instability with other students. Students will critique the weaknesses and strengths of discovered.</p>	<ol style="list-style-type: none"> 1. Venn Diagram completion and analysis. 2. Correct research and note taking methodology. 3. Collaboration and genuine feedback techniques. 4. Thoughtful analysis of opposing viewpoints. 5. Demonstrated knowledge in use of technology to find supporting and non-supporting evidence. 6. Active participation in classroom virtual field trips and scientist interviews. 7. Sharing information nodes with others, including those with opposing viewpoints.
<p>Assessment OF Learning: (ex: performance task, project, final paper)</p> <p>AOL1: Students create a poster/ Powerpoint/ or other digital product such as Padlet or Thinglink presentation that reflects their understanding and assessment of sharks’ roles in ocean and coral reef ecosystems.</p> <p>AOL2: Students will host a classroom debate on evidence on sharks’ importance to maintaining a balance in the ocean and coral reef ecosystem and what changes (if any) are needed to address the issue of shark depopulation..</p> <p>AOL3: Students will create and maintain a ThingLink virtual poster to share progress during research.</p>	<ol style="list-style-type: none"> 1. Content addressing arguments for and against shark and ocean preservation with their own view clearly supported. 2. Organized and neat product that can be viewed and understood by others without explanation. 3. Organized and factual debate to support viewpoint. Displays good listening skills and follows accepted debating protocols.

Stage 3 – Learning Plan

All Links for this lesson are included in this Thinglink picture for ease of presentation [Here](#)

Day One: What are sharks? What do you know about them?

Lesson 1- Introduce vocabulary: balanced ecosystem, coral reef, food web, media influence, apex predator, predator, prey, types of sharks. Create a KWL chart about sharks in general. Watch [National Geographic Video](#). (3:46 long) Watch “[How jaws Changed the World.](#)” (2:37 long). Students discuss where sharks are usually located. Let students visit and explore the shark live tracker at [Ocearch.org](#) to see shark movement and hunting patterns. Use collaboration tool such as Padlet, Thinglink or class shared Google Document to collect research data from the Internet. Groups will discuss and document new information gained through research. Exit ticket: Use technology collaboration tool such as class level Padlet (padlet.com), Thinglink (Thinglink.com), class Blog, class shared Google Document, or sticky notes to add a piece of information to class KWL chart. copy notes to personal journal. collect research data from the Internet.

Day Two: What are sharks roles in the coral and ocean ecosystems?

Lesson 2- Students will create a KWL chart about sharks and their roles in the ecosystems. Watch National Geographic’s [Why Oceans Matter](#) (2:40 long) Students will play shark checkers game. <http://tinyurl.com/Shark-Checkers>. (***Must be printed and prepared in advance.***) Teachers will guide students to a modified rule for the second or third rotation of play. This rule should include the lack of sharks and reproduction of all other species to see how the gameplay differs. Students will discuss how the population graphs differ as the lack of predators becomes more profound. Students will review the class Thinglink, Padlet, Blog, or Sticky note KWL board concerning shark depopulation and its effects on the ocean and coral reef ecosystems.. A second discussion concerning what they now understand will lead to a review of the initial KWL chart. Exit Ticket-journal thoughts concerning how the ocean and people may be affected by shark population decline differently and similarly than to themselves.

Day Three: Human interaction with the ocean and and shark population decline

Introduce vocabulary: pollution, overfishing, finning, cultural diets. Students will discuss what human interaction they think occurs with sharks and add it to their KWL charts digital or analog. Watch [The Truth about Sharks by Ocean First](#). (1:59). Students will discuss how these habits affect shark populations and refine KWL charts. Watch [Why Sharks are Critical to our Marine Ecosystem](#) (Note..the video is 35 min long, teachers should view video first to familiarize topic points. Main points of video are Background and Decline of Sharks 3:15-7:10; Ecosystems with and Without Sharks; Watch 7:10-13:00 Human interaction. Group discussion concerning how shark depopulation is occurring and what effects it is having to the ocean and themselves. Discuss how it may also affect others. Exit Ticket: add at least two items of knowledge to class padlet, thinglink, blog or sticky note board. Reflect in their personal journal on what they can do to help sharks.

Day Four: What can you do to help save sharks?

Introduce vocabulary: conservation, preservation, Watch [Sharkwater](#) video (2:15) and [Sharkwater 2](#) (1:59) Have students discuss ways that they can help save sharks. Create brainstorming board on Padlet, Thinglink, or sticky note board. Visit [savingsharks.com](#), [Sharktrust.org](#), [Bite-back.com](#), and [FIU Shark BAY Ecosystem](#) and the thinglink at <https://www.thinglink.com/scene/869747559722123265> for some ideas. Have students research ideas on their own and prepare to present to the class. Add new ideas to class Padlet, Thinglink or sticky note board. Students begin to brainstorm possible presentation projects. Exit Ticket..reflect in personal journals what they have learned, what they have discovered that previous understanding about sharks have been incorrect, what they can do to help sharks..

Day Five: Work on and complete final projects

Students work in small groups to prepare and finalize digital or analog presentations of why sharks are critically important to the ocean and reef ecosystems, why sharks are endangered and what can be done to help protect them. Insure that students address what they can do to help in this matter. Students will present and have them saved by video, Thinglink, Padlet, powerpoint, or poster board for assessment.

Assessment Rubric: located [here](#)

Day Six (if desired). Students finish presentations. Students can also craft a paper shark following directions [here](#), [here](#) to have an additional multimedia arts tie in to the lesson.



The following sites are included on the provided starting point Thinglink provided at : <https://www.thinglink.com/scene/869747559722123265>

1. **Ted Talk: Simon Berrow:** [How do you save a shark you know nothing about?](#)
2. **Ted Talk: Jeremy Jackson:** [How we wrecked the ocean.](#) (5:00-7:00)
3. Watch Discovery Channel's [Why sharks are important to Reefs](#) (1:04)
4. [Shark Conservation and Awareness Video](#) (3:42)
5. UCTV Andy Nosal- Scripps Oceanography [Shark Conservation: Safeguarding our Future](#) Human interaction 11:14-19:59, Bad rep (20:30-30:00), shark movies 24:12- 26:11-- Great for teacher to preview
6. **BEST connection!** to Balance Forward Thinking video [The Future of Sharks](#) (4:14)
7. Snapping shark craft <https://www.highlightskids.com/crafts/snapping-shark>
8. PDF <http://www.sharksider.com/wp-content/uploads/2015/01/the-top-50-coolest-sharks-in-the-world-free-ebook.pdf>
9. Literary context tie in fiction book excerpt [Shark Wars](#)

*adapted from *Understanding by Design Model*

UBD Lesson Template

Lesson Title: KWL - Sharks...a Critical Part of the Coral Reef Subject: Science,Math Prepared by: Roy Bartnick

Materials Needed:

- Internet connection
- Skype capabilities (camera, computer, microphone)
- iPads or student computers
- Poster Boards
- Markers, Pens, Scissors, Glue
- Notebooks for personal journals
- Post it Notes
- Powerpoint/Google Slides
- Thinglink and PADlet membership

Global Competency:

1. Investigate the world
2. Weigh different perspectives
3. Communicate idea
4. Take action

Where is the lesson going?
(Learning Target or SWBAT)

Students will be able to describe how sharks are critical to the coral reef and ocean ecosystems and how shark population decline affects more than just the oceans.

Hook:

Watch [National Geographic Video](#). and [How Jaws Changed the World](#) video trailers. **Show provided Thinglink for student exploration [Here](#)**

Equip:

After viewing the videos, the teacher will show students the website [Ocearch.org](#) to show where sharks are currently being tracked on the world map. The teacher will point out latitudes and longitudes for shark locations to reinforce map skills. Students will work with a partner to create initial personal journals for note taking and reflection.

Rethink and revise:

Tailored Differentiation:

- Additional assistance for ELL students will be provided by peers, teacher assistants and Google Translate.
- Inclusion of SPED teachers in project will assure aligned assistance is given outside of classroom as well as within the classroom for students with special needs.
- Students will work collaboratively within mixed ability groups.

Students will revise ideas and thoughts in personal journal after each lesson, peer interaction, and personal reflection. If digital journals such as Padlet, Thinglink or blogs are used, students can continue adding new information outside of class.

Evaluate:

The teacher will provide a rubric for the final project at the initial onset of the lesson. Located [here](#)

Notes:

Lesson dates may vary as scheduling for various Skype locations availability will still have to be solidified. This would include reordering skype session(s) if needed.

Organization:

- Thinglink/ Padlet, and class web page will be set up for student interaction
- Shark tracker locations map activity will be copied and prepared
- Videos will be queued and ready to go.
- Technology will be pre checked prior to each lesson to include website functionality
- iPds and computer labs will be scheduled as needed in advance to ensure availability