Student Name:

**Analyzing a Major Global Challenge (Threats to Ocean Health) in Earth and Space Science**

**Graduation Standard 1:**  Asking scientific questions & defining scientific problems in the fields of earth and space science, life science, chemistry, and physics.

* Students will be able to ask scientific questions about the text they read, observed phenomena, and conclusions drawn from models or scientific investigations.

**Research Standard:** Students will conduct research to solve a problem, address a question, or develop a position by gathering materials and evidence from diverse sources.

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| **INDICATOR** | **1** | **2** | **3** | **4** |
| **Ask scientific questions to analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. (Adapted from HS-ETS1-1)** | * I can identify a scientific question about a global challenge.
* I can identify a major global challenge (problem) and its connection to societal needs and wants
* I can list the elements, relationships, and boundaries of the problem as it relates to the system.
* I can explain a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
 | * I can ask scientific questions to clarify my understanding of a global challenge.
* I can explain a major global challenge (problem) and its connection to societal needs and wants.
* I can identify the elements, relationships, and boundaries of the problem as it relates to the system.
* I can describe a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
 | * I can refine scientific questions to make them more useful in obtaining information on a global challenge.
* I can describe a major global challenge (problem) and its connection to societal needs and wants.
* I can explain the elements, relationships, and boundaries of the problem as it relates to the system.

 * I can analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
 | * I can refine a scientific question and create further questions to make additional connections or acquire related information on a global challenge.

 * I can analyze a major global challenge (problem) and its connection to societal needs and wants.

 * I can describe the elements, relationships, and boundaries of the problem as it relates to the system.

 * I can evaluate a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
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| **Students will generate a research question and develop and refine a plan to address this question (RPI-1).** | *
 | * I can use a research question and form a research plan to address the question.
 | * I can construct a research question and develop and refine a plan to address the question.
 | * I can identify a topic, formulate a research question, and develop and refine a plan to address the question.
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| **Students will express their findings orally and/or in writing in order to demonstrate knowledge of the topic (RPI-4).** | *
 | * I can demonstrate understanding of my topic in writing and/or orally by restating facts and drawing conclusions from my research.
 | * I can demonstrate understanding of my topic in writing and/or orally by establishing a hypothesis/thesis and drawing conclusions from my research to support my point of view.
 | * I can demonstrate understanding of my topic in writing or orally by establishing a hypothesis/thesis, connecting my ideas to my research and the work of others, and generating new knowledge appropriate to the audience.
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| **Students will adhere to citation guidelines and respect intellectual property rights (RPI-5).** | *
 | * I can cite sources according to required format with inconsistent results and/or include media that violates copyright guidelines.
 | * I can cite sources and use in-text citations according to required format (e.g. MLA, APA, Chicago) and follow all fair use and copyright guidelines.
 | * I can cite sources according to the required format, vary style when using in-text citations (e.g. paraphrase, summary, direct quote) and follow all fair use and copyright guidelines.
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**PART 1: Asking Questions and Identifying the Problem to be Solved**

* What question(s) did you form to learn more about threats to ocean health?
* How did you revise your question(s) as you were searching to find information?
* What keyword(s) did you use to search for information?

**Directions:**  **You will identify, and then investigate, a particular threat to ocean health by examining scientifically valid sources of information. You will then use this information to develop a specific scientific research question that researchers could use to learn more about your topic as they search for solutions to the challenges facing our oceans. You will use Advanced Google Searches, WHS library database searches, class materials, and videos to conduct research on a specific threat to the health of our Planet’s oceans, and then organize your research using Noodletools. Use this information to answer the following questions, or complete further research if you cannot formulate a response.**

* What broad, general ocean health issue do you want to learn more about?
* Now identify a narrower, specific aspect of this issue that you’d like to examine in depth. What is a particular location where this is an issue, and what is the specific impact on this location that you are concerned about?
* Explain why the ocean problem that you are exploring is a major global challenge.
* Explain how the narrow topic that you will research relates to the overall global challenge of ocean health.

**PART 2: Defining the Boundaries or Components of the System**

**Directions:** Use your Noodletools notes from the research that you conducted to respond to the questions below.

* Define the scale of the problem (local, national, global, etc.)
* Is this problem societal, or environmental? Describe why or how.
* Explain in detail which of Earth’s 4 systems (atmosphere, biosphere, geosphere, hydrosphere) are connected to/impacted by this global challenge.
* How is this ocean problem (major global challenge) connected to human needs?
* How is this ocean problem (major global challenge) connected to human wants?
* List some important qualitative information about this problem (major global challenge)?
* List some important quantitative information/data about this problem (major global challenge)?

**PART 3: Defining the criteria and constraints**

* What could be some major consequences to society and/or the natural world (on both global and local scales) if this problem remains unsolved?
* What are some acceptable solutions or possible solutions to the problem?
* What are some challenges/constraints to these possible solutions?

**PART 4: Conclusion**

* Directions: You should respond to the prompt in 1-2 paragraphs of 5-8 sentences each.
* Prompt:
	+ After completing your research, what are your overall thoughts about the global challenge of ocean health and how it affects the world and humans? What did you learn about the impact it has on humans and/or the impact caused by humans? Have your thoughts or ideas changed? Would you, or do you, have a different question now about ocean health?

**PART 5: Works Cited Page**

Directions: Copy and past your works cited page from NoodleTools below.