**Summative Assessment: WHS Science Graduation Standard #6,**

**Engaging in Argument from Evidence**

**Earth and Space Science, Mr. Lanik**

**Objective:** *Using scientific information on Maine’s bedrock geology, students will develop an evidence-based scientific argument about past tectonic plate motions and the formation of Maine.*

**Performance Indicator Rubric:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **NGSS Indicator** | **HS-ESS1-6  Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.**   * **Evaluate evidence behind currently accepted explanations or solutions to determine the merits of arguments.** | | | |
| **Content** | **1** | **2** | **3** | **4** |
|  | I can list the 3 sources of heat within planet earth. | I can state the 3 sources of heat within planet earth and how that heat manifests into plate movement on earth’s surface. | I can explain the 3 sources of heat within planet earth and how that heat manifests into plate movement on earth’s surface. | I can examine the 3 sources of heat within planet earth and how that heat manifests into plate movement on earth’s surface. |
|  | I can state the evidence that convection within our mantle effects plate movement. | I can show the evidence that convection within our mantle effects plate movement. | I can mathematically and graphically model that convection within our mantle effects plate movement. | I can mathematically and graphically *build a model* showing that convection within our mantle effects plate movement. |
|  | I can list the 3 ways that earth's plates move over time. | I can state the 3 ways that earth's plates move over time. | I can illustrate, as evidence, the 3 ways that earth's plates move over time. | I can give reasons, through evidence, the 3 ways that earth's plates move over time. |
|  | I can list the 3 different plate boundary types. | I can state the 3 different plate boundary types. | I can illustrate the geologic processes found at the 3 different plate boundary types as evidence supporting the modern theory of plate tectonics. | I can *build models* to show the geologic processes found at the 3 different plate boundary types as evidence supporting the modern theory of plate tectonics. |
|  | **GS #6:**  I can *list the evidence* of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks. | **GS #6:**  I can *state the evidence* of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks. | **GS #6:**  I can *evaluate evidence* of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal  rocks. | **GS #6:**  I can *evaluate evidence* of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal  rocks. |

**Assignment:** Your assignment is to demonstrate proficiency in Science Graduation Standard #6, Engaging in Argument from Evidence, by developing an evidence-based argument that either supports, or rejects, a scientific claim about past tectonic plate activity and the formation of the bedrock that lies beneath the State of Maine. In the space below are two scientific claims:

Claim #1: The current geologic landscape of Maine was shaped, in part, by a convergent boundary/subduction zone.

Claim #2: The current geologic landscape of Maine was shaped, in part, by a divergent boundary.

Please select only ONE of these claims, and then create an argument that either **supports** the claim, or **rejects** the claim, using evidence from a) the research that you have done into Maine’s history, and b) the bedrock maps of Maine that you researched and produced.

Use the “Scientific Argument Activity Tutorial” to review what a scientific argument is, and to identify the characteristics of “strong” scientific evidence.

**“What is Argument in Science?** *Everyday, people attempt to convince others to agree with their ideas or opinions. How can you decide which ideas are strong and which are weak? How can you evaluate the ideas or opinions of others so as to make a sound decision? One way to is to evaluate whether an opinion or idea is supported by strong evidence and reasoning. When an opinion is science-based and supported by both scientific evidence and reasoning (known science concepts), it is called a* ***scientific argument****.*”

“**Characteristics of Strong Evidence:**

*1. Includes trends or patterns found in data analysis (Pattern-based)*

*2. Multiple trials/observations are reported and analyzed (Reliable)*

*3. Evidence is scientifically correct and appropriate to the question (Accurate)*

*4. There are enough pieces of appropriate evidence (Sufficient)”*

As you begin the process of gathering evidence in support of your claim, please make use of the notes that we have produced on tectonic plate movements, and the landforms that they produce.

**Your Argument:**

**Scientific Evidence that supports your argument (you need 3 different pieces of evidence), and the reasoning that the evidence supports the argument.**

**Evidence Statement 1:**

*Reasoning for Evidence 1 Supporting the Claim--*

**Evidence Statement 2:**

*Reasoning for Evidence 2 Supporting the Claim--*

**Evidence Statement 3:**

*Reasoning for Evidence 3 Supporting the Claim--*