**Unit #8 Research Project: Energy Concepts Related to Earth**

**Part 1**

In Part 1 of this research project you will work with a partner to create an infographic, video, TikTok, or something else you think would be cool (be sure to get it approved first!) that covers one of the following topics: 1) plate tectonics, 2) the rock cycle, or 3) the “spheres”. *We will need to divide the topics equally, as we will be building from our initial research in the days to follow!*

**The details for each topic are as follows:**

PLATE TECTONICS must include…

* Drawing or model of cross section of the Earth with descriptions of each radial layer
* Definition of density
* Explain the role mantle convection plays in plate tectonics
* Definition and cause of seismic waves, and their role in plate tectonics
* Definition of subduction zones
* ***Explain how energy*** is used/transferred in terms of plate tectonics

ROCK CYCLE must include…

* Drawing or model of the rock cycle with descriptions of each type of rock
* Explanation of mechanisms that drive the rock cycle
  + Erosion, metamorphism, lithification, etc.
* Explanation of relative age and location of rocks
* Compare and contrast convergent and divergent plate boundaries relative to the type, age, and location of crustal rocks
* ***Explain how energy*** is used/transferred in terms of the rock cycle

“THE SPHERES” must include…

* Definition of hydrosphere, geosphere, and atmosphere
* Drawing or model of the geosphere, hydrosphere, and atmosphere *(include additional layers if there are subsections in each of the “spheres”)*
* Explain the role thermal convection plays in forming radial layers
  + Cycling of matter
  + Gravitational movement of denser material
* Definition of magnetic field and cause of Earth’s magnetic field
* ***Explain the flow of energy*** between the hydrosphere, geosphere, and atmosphere

**Extra Tips/Notes:**

Visuals with captions or explanations can be useful.

Be sure to document the sources for your information.

You must include *at least three* reliable sources for your information!

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**Part 2**

In Part 1 of this research project you worked with a partner to create an infographic, video, TikTok, or something else you thought would be cool (that was approved!) that covered one of the following topics: 1) plate tectonics, 2) the rock cycle, or 3) the “spheres”. In Part 2 of this research project you will work with two other partnerships and combine the collective knowledge that you all bring to the table as experts on your respective topics into a single presentation. *We divided the topics equally and will now combine with two other partnerships to make bigger groups. You will have one set of partners representing each of the topics working in a group together for a total of six people.*

**The presentation details are as follows:**

* Create a model/drawing/poster that connects how the energy is used or transferred through all three topics: plate tectonics, the rock cycle, and the “spheres”.
  + Should use arrows, descriptions, etc. to help interpret how energy is used/transferred through each individual part and then through all three
  + Ideally, what was done for Part 1 can be used in Part 2 with some additions or modifications
* Develop one question per topic (three questions total) that you could use to assess the class based on the content you teach.
  + Questions can be handwritten or typed, just be sure they are turned in.
* Be prepared to present your work as a group…
  + 3-5 minutes
  + Each partnership must present on their own topic (can show independent work from Part 1 as a part of the presentation, just be sure to refer to the final product of Part 2 as well).
  + Speaking parts should be evenly distributed among all group members.
  + Be prepared to answer any questions from the class.
  + If time, ask the questions you prepared for the class to assess their understanding!

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| **PROJECT RUBRIC** | | | | | |
|  | **5** | **4** | **3** | **2** | **1** |
| Thoroughness | Each topic addresses all technical information outlined in the prompt using appropriate academic language. | Each topic addresses most technical information outlined in the prompt using appropriate academic language. | Each topic addresses some technical information outlined in the prompt using occasional academic language. | Topics address some technical information outlined in the prompt using minimal academic language. | Technical information outlined in the prompt is largely missing from topics and academic language is not used. |
| Completeness | All three topics are included in the project. Each topic includes three reliable resources, for a total of nine sources. | All three topics are included in the project. Each topic includes at least two reliable sources, for a total of at least six sources. | Two topics are included in the project. Each topic includes three reliable sources, for a total of at least six sources. | Two topics are included in the project. Each topic includes at least two reliable sources, for a total of at least four sources. | One topic is included in the project.  OR  Each topic includes one or less reliable sources. |
| Organization | Project is well organized, thoughtful, flows well (use of symbols to show relationships), and is creative. | Project is mostly well organized, thoughtful, flows (use of symbols to show some relationships) and is creative. | Project is organized, thoughtful, and flows (use of symbols to show some relationships). | Project is not well organized, is not thoughtful, does not flow well, or is not creative. | Project is lacking organization, thoughtfulness, flow, and creativity. |
| **PRESENTATION RUBRIC** | | | | | |
| Timing | Presentation is 3-5 minutes, each pair presents own work, and speaking parts are shared evenly. | Presentation is 3-5 minutes long, each pair presents own work, and speaking parts are shared unevenly. | Presentation is less than 3-5 minutes and each pair presents own work. | Presentation is less than 3-5 minutes, and each pair does not present own work or speaking parts are not shared evenly. | Presentation is less than 3-5 minutes, each pair does not present own work, and speaking parts are not shared evenly. |
| Presence | Presenter always maintains good eye contact, speaks with appropriate register and volume, and uses relevant academic language. | Presenter frequently maintains good eye contact, speaks with appropriate register and volume, and uses academic language. | Presenter occasionally maintains good eye contact, speaks with appropriate register and volume, and uses academic language. | Presenter rarely maintains good eye contact, speaks with appropriate register and volume, and uses some academic language. | Presenter does not maintain good eye contact, speak with appropriate register and volume, and use academic language. |

Score = Total Points x 2