

Name: _____

Due Date January 7th

Unit 1: Earth's Spheres Project

“Everything is connected to everything else”

Introduction:

Earth is often referred to as a *system*; a complex whole that is produced by various interacting parts. These parts, which you have learned as *spheres*, interact in very dynamic ways to produce everyday life as well as natural disasters. In this project, you will demonstrate your understanding of each sphere and how Earth represents a system. You will also identify which type of scientist studies each of the spheres as well as a technology used within that particular field. You can choose however you want to complete this task. Be creative! To help you get started, I will assign you a particular interaction (“system”) that occurs between at least 2 of Earth’s spheres. You will do additional research on this assigned interaction, and then give an oral presentation on it.

<i>The spheres that will be included in your project are:</i>		
Atmosphere	Geosphere	Hydrosphere
Biosphere	Lithosphere	

<i>The fields of science that will be included in your project are:</i>		
Meteorology	Hydrology	Environmental Science
Geology	Oceanography	

Assignment:

1. You will create a project that illustrates the 5 spheres and at least 4 interactions between them. a. One of the interactions will be assigned to you. _____
2. You will label each sphere.
3. You will clearly and accurately describe each system.
4. You will correctly identify the energy that produces each of system.
5. You will create a table that indicates the sphere, the field of science that studies the sphere, a piece of technology (equipment) used to study the sphere, and a brief description of the technology. For maximum credit, you will pick one of the pieces of technology and explain **how** it works. What is the mechanism that drives it? How does it make a measurement?
6. You will then deliver an oral presentation only on your assigned system.
7. You will cite all resources (books, websites, where you got all information and pictures) in MLA format

Spheres Project Outline

This is only to help you organize all of your information!

System: 1. a combination of parts forming a complex whole, 2. a regularly interacting or interdependent group of items forming a unified whole, 3. a group of interacting bodies under the influence of related forces.

What are the 5 spheres? Describe each sphere.

1. _____
2. _____
3. _____
4. _____
5. _____

Think about how you will illustrate each of these spheres. Make sure you cite all sources if you choose to use the internet!!

What is your assigned system (interaction)? _____
Describe this system in detail.

Which spheres are interacting to produce this system? _____
How is the system produced by these spheres?

What type of energy produces this system? _____

Which type of scientists would study this system?

Identify a piece of equipment (a technology) these scientists would use to study or monitor this system.
Describe this equipment.

Research this specific system as this is what you will be giving your oral presentation on!!

Identify at least 3 more systems that occur between Earth's spheres. *(This is does not need to be related to your assigned interaction!!) These can be as simple as every day experiences or as big as a natural disaster.*

1. _____

Which spheres are interacting to produce this system? _____

How is the system produced by these spheres?

What type of energy produces this system? _____

2. _____

Which spheres are interacting to produce this system? _____

How is the system produced by these spheres?

What type of energy produces this system? _____

3. _____

Which spheres are interacting to produce this system? _____

How is the system produced by these spheres?

4. You will also re-create the chart below. You will identify the appropriate field of science that studies each sphere, a piece of technology used to study the sphere, and a brief description of the technology. You will also describe how one of the pieces of technology works. You will need to do some research to complete this portion. *Make sure you cite your resources in MLA format.*

Sphere	Field of science associated with this sphere	Technology used to study this sphere	Brief description of the technology	Explain how the technology works (pick 1)
Geosphere				
Atmosphere				
Biosphere				
Hydrosphere				
Lithosphere				

Type of Energy	Description
Solar energy	Energy that is produced directly from the Sun
Geothermal energy	Energy produced in Earth's interior; due to the high temperature of the core and mantle.
Wind energy	The movement of wind can carry objects, weather and erode rocks in the desert, move sediment
Hydropower	Energy derived from free-falling water
Tidal power	Energy that is produced by the tides coming in and out.
Chemical energy	Energy that is stored in the bonds of molecules.
Mechanical energy	Energy stored in objects by the application of force.
Kinetic energy	Energy of moving particles
Thermal energy	given off by all living things, emitted by rocks that have absorbed sunlight

*****Example:** The chemicals in the atmosphere interact with the chemicals in specific types of rocks (geosphere). This process is known as chemical weathering and is driven by chemical energy.

You cannot use this example as one of your systems!!!

Oral Presentation Requirements: (Extra Credit)

- Each student will be assigned one specific interaction, which will be presented to the class. You must research the assigned interaction in detail.
- When you give your oral presentation, you must present your final sphere's project which has an image of the assigned interaction.
- Your oral presentation will only be focused on the interaction that was assigned to you. You must present information on the topic which includes:
 - an image of the assigned system
 - general information about the topic
 - the field of science that studies the topic
 - a description of how this is an interaction between spheres
 - the energy driving the interaction
 - a piece of technology used to study and/or monitor the topic
 - a description of the technology.

Review: Earth's Spheres Project
Grading Rubric

	4 - Exceeds the Standard (25 points)	3 - Meets the Standard (23 points)	2 - Partially Meets the Standard (20 points)	1- Does not meet the standard (17 points)
Illustration of Spheres	All spheres are: Properly illustrated and labeled	4 of the 5 spheres are Properly illustrated and labeled	3 of the 5 spheres are Properly illustrated and labeled	1 or 2 spheres are Properly illustrated and labeled
Interaction of Spheres	Student properly: <ul style="list-style-type: none"> • Illustrates 4 or more interactions between spheres • Describes each Interaction • Identifies the energy associated with each interaction 	Student properly: <ul style="list-style-type: none"> • Illustrates 3 or more interactions between spheres • Describes each Interaction • Identifies the energy associated with each interaction 	Student properly: <ul style="list-style-type: none"> • Illustrates 2 or more interactions between spheres • Describes each Interaction • Identifies the energy associated with each interaction 	Student properly: <ul style="list-style-type: none"> • Illustrates 1 or more interactions between spheres • Describes each Interaction • Identifies the energy associated with each interaction
Technology	Student does all of “meets the standard” PLUS Chooses 1 technology and explains how it works.	Student correctly: <ul style="list-style-type: none"> • Identifies the field of science associated with each sphere • Identifies a technology used in each field • Describes what the Technology observes/ measures 	Student correctly: <ul style="list-style-type: none"> • Identifies the field of science associated with 4 Spheres • Identifies a technology used in each field • Describes what the Technology observes/ measures 	Student correctly: <ul style="list-style-type: none"> • Identifies the field of science associated with 3 Spheres • Identifies a technology used in each field • Describes what the Technology observes/ measures
Quality of Work	Student does all of “meets the standard” PLUS <ul style="list-style-type: none"> ○ Project is visually appealing ○ Advanced research restricted to .edu and .gov 	Work is neat and organized Spelling is correct Descriptions are Grammatically correct 3 to 4 resources listed	Work is neat and organized Spelling is correct Descriptions are Grammatically correct 1 to 2 resources listed	Work is neat and organized Spelling is correct Descriptions are Grammatically correct No resources listed

Self-assessment: Did you strive for a 4, 3, 2, or 1? (Circle the appropriate number.) **Visual** _____/100

Earth's Spheres Project
Spheres Presentation Hints

If you are having difficulties identifying a piece of technology the scientists would use to study a particular sphere, try searching the internet for the answers to the following questions.

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. “How are earthquakes measured?” 2. “How is the seafloor measured?” 3. “How is the atmosphere measured?” 4. “How are glaciers measured?” 5. “How is water pollution measured?” 6. “How are auroras measured?” 7. “How are volcanoes measured?” 8. “How is the ozone hole measured?” 9. “How is wind speed measured?” | <ol style="list-style-type: none"> 10. “Weather technology” 11. “How is the ocean surface temperature measured?” 12. “How is sound used to map the ocean floor?” 13. “How is air quality measured?” 14. “Animal tracking technology” 15. “How is global sea level tracked?” 16. ”How is ice sheet elevation measured?” 17. “tsunami tracking technology” |
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Links for Research

Atmosphere	Geosphere	Biosphere	Hydrosphere	Lithosphere
National Hurricane Center Tracking Hurricanes	Volcanoes Geological Survey Volcano technology	Forest Fires	Flooding	Mining Fracking
Tornado Climatology	Earthquake Technology Seismographs	Droughts	El Nino	Invasive Species
National Severe Storms Tsunami	Mudslides/Landslides	Habitat Destruction Deforestation Overfishing	Tropical storms	Sustainable Farming Industrial Agriculture
Pollution and Air Pollution	Sand Dune Erosion	Freshwater Ecosystems		Drilling