

Name

Exploration 2: Evidence of Change September 4

Identify the components of El Niño. Which of Earth's systems are impacted by El Niño?

(Biosphere, geosphere, atmosphere, hydrosphere)

- ocean water, winds
- hydrosphere, geosphere, atmosphere, biosphere
- model: simplified representation of how Earth's systems have changed over time.
- Gather evidence that shows at least one way in which the Earth has changed in 4.5 billion years.
 - the fossil record shows how earth systems have changed
 - * cute furry woolly mammoths in Missouri imply that Missouri used to be cold
 - ice core samples trap atmospheric gasses which are analyzed to determine the composition of the atmosphere long ago.

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Exploration 2: Evidence September of change

- How can gathering data and analyzing patterns help us explain phenomena and predict future conditions?
- We can predict the amount of coral bleaching based on trends in water temperature. The warmer the water, the more coral bleaching occurs. Therefore we can predict coral bleaching patterns based on water temperature models.

1.2 Earth Systems September 9

- Record observations about Earth's systems and the ways scientists use models to understand Earth's systems.
- How is Earth divided into systems? How do they interact? What are their boundaries?

geosphere: all of the hard or liquid rock on Earth

- the inside of the earth to the mountains

atmosphere: all of the air and particles surrounding the Earth

- Within 100km of Earth's surface is the boundary

hydrosphere: includes all forms of water on the Earth's surface, underground, or in the air

- How does the hydrosphere interacts with other earth systems

Black Table → gets the caves wet which causes erosion, affects geosphere

green table -> Evaporation of water impacts the humidity of the atmosphere.

- biosphere: all living things on Earth

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Exploration I: Modeling Earth September 11

Compare Earth's four systems. how are they related, what are each of the systems made of?

When rain drops down on the hill it goes to the ocean where it is absorbed by sunlight. The hydrosphere is made up of water and the geosphere is made up of all rock both liquid and solid. The absorption (evaporation) of water into water vapor increases the humidity of the air surrounding the earth. The atmosphere is made up of all the gasses in the atmosphere.

Water vapor condenses into rain which allows for plant growth. This plant growth is part of the biosphere which is composed of all living organisms.

Name

Earth Systems Exploration Q September 16

- Based on the data, what happened to the size of the hole in the Ozone from the mid 1970's to the mid 1990's?

in 1979 the graph has increased, in 1988 it had decreased bad. [The graph is everywhere now.]

Starting In 1979, the hole in the ozone increased in size. This trend continued until 1988 when there was a sharp decrease in the size of the hole in the ozone. The trend of an increase in the size of the hole in the ozone resumed after 1988 through 1994.

- How does the release of CFC's affect the amount of UV-B that reach the Earth's surface?

The release of CFC's reduces the thickness of the ozone layer which causes holes in the ozone to form. This reduction in the ozone increases the amount of UVB that

reaches the earth's surface.

- Why is it more important to protect your skin when outdoors now compared to the 1950s?

The UV lights burn your skin, because the ozone got reduced over the years

The ozone has reduced in size since the 1950's. This reduction allows more UV-B light to reach Earth's surface, therefore causing higher levels of skin damage.

Based on the 3D model

- 1) What is the cause of the difference in the ozone hole between 1979 to 1990?

The CFCs react with O₃ causing a hole to form in the ozone layer.

- 2) What would the 1990 map look like if no CFCs were emitted?

Name _____

Exploration 3: Viewing Earth... September 18

DO NOW

- 2) The Four major Earth systems are the biosphere, geosphere, hydrosphere, and atmosphere. The hydrosphere and the atmosphere interact with each other during the water cycle. Water from the hydrosphere is converted into water vapor by evaporation. The oceans give all of the cute fish a place to live. This is an example of the biosphere interacting with the hydrosphere. The geosphere and the biosphere interact because the rocks of the geosphere provide minerals for plants (biosphere) to grow.

- 1) Can you tell which way the river is flowing based on the map? The map does show that the river flows to the southeast because of the higher elevation of the rocky area. Water must travel from areas of higher elevation to lower elevation due to gravity.

2) Based on the map, can you tell why the lakes formed?

The map shows that there are two lakes but does not show exactly why those lakes exist. We can infer how the lakes might have formed based on the elevation data shown by the topographical map.

3) What other information would be useful for knowing why the rivers and lakes are located where they are?

Precipitation data would be useful to know in order to determine the source of the lake water. Snow pack and rainfall could be the factors that supply the ecosystems with water.

Name

Earth's Energy

September 25

- Why might large volcanic eruptions have a cooling effect of Earth's surface?

| Volcanic eruptions lower the temperature of the earth's surface due to the release of particles into the atmosphere. These particles from the eruption block some of the sunlight from reaching Earth's surface therefore cooling Earth's temperature.

- radiation: the emission and propagation of energy in the form of electromagnetic waves also moving sub atomic particles.

- conduction: the transfer of heat energy through the collisions of atoms or molecules.

- convection: movement of matter caused by differences in density

Name

Exploration I: Earth's Energy

October 1

Name

Exploration 2: Earth's External Energy October 4

albedo: the measure of the percentage of light that a particular surface will reflect.

- Draw a model of how earth's external energy changes when albedo increases due to a volcanic eruption. How is surface temperature impacted by this increase in albedo?

Name

Exploration 4: Earth's Internal Energy, October 9

DO NOW

Define albedo, how does albedo play a role in earth's level of solar radiation?

Which two earth systems redistribute energy around the earth? How do those systems function?

The hydrosphere and the atmosphere redistribute solar radiation around the planet. Solar radiation warms the ocean water at the equator. This warm ocean water creates a current that flows towards the poles. This current pushes cool ocean water from the poles toward the equator, where that water is warmed by solar radiation. This cycle repeats.

- accretion: gradual increase in size due to addition
- Do you think that collision heating can happen today? Why or why not.
- isotope: one or more elements that have additional neutrons in the nucleus

- How would the earth's mantle and crust be different without radioactive isotopes?

Radioactive isotopes provide thermal energy for the mantle & crust. Without those radioactive isotopes, the mantle would cool.

Name

Exploration I: Introducing Minerals October 14

- crystal: a solid whose atoms are arranged in a repeating pattern
- element: a substance that cannot be broken down into simpler substances by chemical means
- compound: more than one element chemically combined

Name

Exploration 2: Properties of Minerals October 16

- Describe the luster, color, and transparency of three mineral examples from the text.

Quartz has a pink color, glassy luster, and is transparent.

Name

Exploration 1: Rocks and Rock Cycle

October 23

DO NOW

What are three tests that geologists use to determine the identity of a mineral?

The Scratch test, Shape test, and streak test



hardness



pattern
structure



Powder
color

Cleavage

Which of Earth's spheres might be a source of the material for the rock (pg 72)?

Claim: The biosphere was a source of the material for the rock.

Evidence: The rock has fossils of sea shells embedded in the rock sample.

Reasoning: Living things, such as crustaceans, use sea shells for protection. Many seashells together in a small space indicates living things inhabited the area.

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Exploration 2: Sedimentary Rock October 25

Types of Sedimentary Rock

- 1) clastic: made from pre existing rock
- 2) chemical: formed when minerals dissolved in water form a precipitate (solid)
- 3) organic: made from organic material such as sea shells

Name

Exploration 3: Igneous Rock

October 28

DO NOW

- 1) What are three types of sedimentary rocks?

Three types of sedimentary rock are clastic, chemical, and organic.

- extrusive igneous: rock formed when lava on the earth's surface cools quickly. Small to no crystals visible

• Examples

Obsidian

Rhyolite

- intrusive igneous: magma cools underneath the earth's surface. Longer cooling period results in larger, more coarse grained texture.

• Examples

granite

- Compare the composition of mafic and felsic rocks.

• Mafic rocks are lower in silicon dioxide composition ($\approx 50\%$) whereas felsic rock is higher in silicon dioxide ($\approx 70\%$).

- How can geologists use color to determine the composition of fine grained igneous rock?
- Basalt forms in sills and dikes because sills and dikes are pockets of empty space beneath the earth's surface. Magma seeps into these pockets, then cools quickly to form basalt igneous rock.

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Exploration 4: Metamorphic Rock

October 30

Do Now

- How do geologists classify igneous rock?
- foliated metamorphic rock: metamorphic rock that breaks along parallel lines
- nonfoliated metamorphic rock: metamorphic rock that does not break evenly
- what test could we run to determine the identity of an unknown metamorphic rock?
 - we can use the cleavage test to determine the pattern of the internal structure of the rock.

Name _____

Exploration 4: Metamorphic Rock November

Types of Metamorphic Rock

1) Foliated metamorphic

↳ breaks along flat or parallel planes

- Example

Slate

Schist

2) Non Foliated Metamorphic

↳ Break less evenly, have a texture like igneous

- Example

Marble

CHECK FOR

MISSING WORK

Name

Exploration I: Carbon in Earth Systems November 11

- Which sphere does carbon in coral reefs come from?
 - Carbon in the coral reefs originated from the atmosphere. Carbon dioxide molecules dissolved into the oceans.
- carbon cycle: the movement of carbon between the geosphere, atmosphere, biosphere, and hydrosphere
- reservoir: a place where something is stored.
- How would the processes and reservoirs of the carbon cycle change over time if photosynthesis stopped?
 - The plants would no longer absorb carbon dioxide from the atmosphere. This would increase the amount of carbon stored in the atmosphere.

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Exploration 2: System Models December 2

- Black box model: only shows the inputs & outputs of a system, Does NOT show how inputs are converted into outputs.
- Positive Feedback: original change is increased
- negative feedback: original change is decreased

Exploration 1: Earth's Changing Surface

None
Feb 24

- Can rocks 'grow' from small to large pieces? If so, is that a usual process?
 - Rocks can grow from small to large when rocks are broken into smaller pieces + then those smaller pieces are pushed/formed together.
 - Rocks cannot grow from small to large pieces because that does not make sense physically.