Name

Exploration 1: Surface Processes

February 21

- surface processes: processes that happen at at or near the earth's surface in the geosphere
- Examples of how the geosphere / rock formations are impacted by other spheres.
  - biosphere: plant life grows into cracks in rocks surface
  - hydrosphere: waves erode rock formations
  - atmosphere: wind erodes rock formation
- weathering: breakdown of rock into smaller pieces
- erosion: movement and transport of materials
- deposition: dropping of materials due to freezing and thawing of ice.

El Niño/La Niña is a system, what are the components of the system?

ocean water, temperature, wind

Which sphere of earth systems does El Niño apply to?

Biosphere, hydrosphere

Name

Exploration 2 Change in System September 4

model: simplified representations to understand how earth's systems have changed over time.

- fossil record helps to determine the climate and ecosystem of an area a long time ago.
- ice core samples trap air from thousands of years ago. These ice core samples show what atmosphere was like.

Name

Exploration 2: Evidence of change September 6

Fossil Record

Ice core sampling

How can gathering data and analyzing patterns help us explain phenomena and predict future conditions?

Communism is very bad

Name

1.2 Earth's Systems September 9

- Record observations of ways in which scientists use models to understand Earth.
- What are some ways to separate earth into subsystems?
  - geosphere: all the rock biosphere: all living things
  - atmosphere: all air around Earth
- What are the boundaries of those systems? How do they interact?
  - geosphere boundary is/are rocks
  - atmosphere boundary is all air particles.
  - ~~What are examples of interactions between the~~

hydrosphere and other subsystems?

- water cycle - water evaporates to form clouds, the clouds produce precipitation which provides water to biosphere.
- How do human activities impact Earth's subsystems?
  - dumping waste into local streams damages the biosphere and hydrosphere.

- air pollution from industrial manufacturing plants alters the atmosphere
- Farming with pesticides impacts the geosphere and hydrosphere due to runoff waste.

Biosphere, hydrosphere, geosphere, atmosphere

Compare the four main systems and summarize how they are related in terms of the matter and energy they are composed of.

Name

Earth Systems Exploration 2 September 16

- Based on the graph, what do you think happened to the size of the ozone hole between 1995 and 2000? The chart indicates that the hole in the ozone might increase from 1995 to 2000 due to the upward trend in the data during the early 90's.

- How do CFCs released into the atmosphere affect the amount of UV-B radiation?

- Why is it more important to protect your skin now than in the 1950's.
  - use data to support answer

- What are the four major Earth systems?
The geosphere, biosphere, atmosphere, and hydrosphere are the 4 major Earth systems. The atmosphere and the biosphere interact by the cute animals breathing in oxygen from the atmosphere. The atmosphere and the hydrosphere interact during the process of evaporation, when the water is converted into gaseous water vapor.

1) Can you tell which way the river is flowing based on the topographic map?
The river

2) Can you tell why the lake was formed based on topographical map?
The river flows into the lake due to lower elevation

3) What other information is needed to tell why the river & lake formed?
We need to know where water source of the river comes from, & how much water is generated from that source.

Name

Earth's Energy

September 25

Why do you think that volcanic erruptions might have a cooling effect on Earth's surface?

- radiation: the emission and propagation of energy in the form of electromagnetic waves also moving subatomic particles
- conduction: transfer of heat through the collisions of the atoms or molecules of a substance.
- convection: the movement of matter caused by differences in density

Name

Exploration 2: Earths External Energy October 4

- Draw a model that shows the temporary increase in Earth's Albedo (ability to reflect sunlight) during a volcanic eruption.

Name

Exploration 3: Distribution... October 7

- Explain why seasons are the most extreme at the poles?

- The amount of radiation emitted to space from the polar regions is greater than the amount of radiation that they recieve from the sun. How is this possible? The pole regions have a lot of ice and snow which reflects radiation from the sun. This contrasts with the equator which absorbs more radiation than it reflects due to the amount of plant life.

- How did the sulfur dioxide from Mt. Pinatubo

Name

October 9

Exploration 4: Earths Internal Energy

Do Now

Define albedo, how does it impact external energy from the sun?

Albedo measures how reflective a material is. Ice has high albedo so it reflects radiation from the sun.

Which two earth systems redistribute energy? How do these mechanisms work?

The hydrosphere and the atmosphere redistribute energy around the globe. The oceans absorb radiation from the sun, particularly at the equator, forming ocean currents. These currents move warmer water towards the poles therefore moving cooler water from the poles towards the equator where that water is warmed again. This process repeats itself all of the time.

accretion: gradual increase in size due to external addition

- Do you think that collisional heating can occur today? Why or why not.

Collisional heat can still occur today via asteroid/comet collision with the earths surface.

- as earth aquired more surface from collisions, its gravitational pull increased. This increase in gravitational pull caused more collisions

Name

Exploration 1 Introducing Minerals October 14

crystal: a solid that has a regular or repeating pattern at the atomic level

element: a substance that cannot be broken down into smaller components by chemical means.

mineral: a natural, inorganic solid that has characteristic chemical composition, an orderly internal structure, and a characteristic set of physical properties

compound: atoms of two or more elements chemically bonded together

- Why are most elements only found in compounds?

Name

Exploration 2: Properties of Minerals | October 16

- Describe the color, luster, and transparency of three samples from the bowls
  - pyrite: metallic, brownish/gold, low transparency

Name

Exploration 1: Rock and the Rock Cycle October 23

Do Now

How do scientists identify minerals?
(List three properties and tests)

- Cleavage test (how a mineral breaks)
- Scratch test (hardness of mineral)
- Streak test (identifies powder color of mineral)

- sedimentary rock: rock formed by the compaction and cementation of particles.
- sediment: solid particles such as weathered rock or deceased organisms, that are transported and deposited near earths surface.
- Igneous rock: rock that forms when Lava or magma cools
- metamorphic rock: rock that is formed under extreme heat or pressure
- rock cycle: processes in which rock forms, changes from one type to another, or is destroyed.

Name

Exploration 2: Sedimentary Rock October 25

Clastic sedimentary: made from pieces of pre existing rock

chemical sedimentary: minerals dissolved in water form a praipitate

Organic sedimentary: made of orgaic material such as shells

Name

Exploration 3: Igneous Rock October 30

DO NOW

1) Which two elements make up silicate?

Silicon and oxygen

Types of Igneous Rock

- intrusive: rock that formed by magma cooling underground
  - typically have large crystals, coarse grained texture
- extrusive: rock formed when lava cools quickly on the earths surface
  - small crystals, fine grained
- mafic: low in silica but high in iron and/or magnesium
  - Dark in color
- felsic: high in silica but low in iron and magnesium
  - Lighter in color
- mafic and felsic igneous rocks are similar in that they are both made primarily out of silica.
- Mafic and felsic igneous rock are different because they are made of differing amounts of silica, changing the color of the rock types.
- Basalt forms in sills and dikes, which are small empty spaces underneath Earths crust.

I Love this Class

Name

Exploration 4: Metamorphic Rock November 6

DO NOW

1) Which mineral do igneous rock primarily contain?
   silica
2) When molten rock solidifies slowly, it forms igneous rock that contains small/(large) crystals. This generally happens (below)/above ground and the rock is classified as (intrusive)/extrusive igneous rock.

Types of Metamorphic Rock

1) Foliated Metamorphic
   ↳ breaks along flat lines
   Examples:
   Slate
   Gneiss
   Schist
2) Nonfoliated Metamorphic
   ↳ breaks less evenly, has similar texture to igneous rock
   Examples:
   Marble
   Quartzite

- How can geologists tell whether a rock is foliated or not?
  A foliated rock has layers that can be seen.

- Why would metamorphic rock resist weathering better than sedimentary rock?
  - Metamorphic rock is more resistant to weathering because metamorphic rock is formed under high temperature and high pressure. These conditions push the atoms of metamorphic rock closer together which makes them more resistant to weathering.

Name

Exploration 1: Carbon in Earth's Systems November 11

- Carbon that makes up coral reefs comes from which sphere? Which sphere might that carbon go next?
  - Carbon that makes up the coral reefs comes from the atmosphere as carbon dioxide disolves into the ocean water. Carbon that makes up coral reefs belongs to the biosphere.
- The atmosphere and living things store carbon.
- carbon cycle: the movement of carbon between the atmosphere, geosphere, hydrosphere, and biosphere.
- most carbon is stored in the geosphere as carbonate and fossil fuels
- smallest amount of carbon is stored in the biosphere because there is much less mass of living things compared to the geosphere and atmosphere.
- How would the processes and resivoirs of the carbon cycle change over time if photosynthesis stopped?
  - Carbon stores in ocean and air would increase

Name

Exploration 1: Carbon in Earth Systems November 18

- Carbon in the ocean comes From CO_2 in the atmosphere. Carbon is used by coral which is part of the biosphere.
- Photosynthesis Equation

$$6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2$$

- Cellular Respiration

$$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$$

Exploration 2: System Models December 2

- black box model only shows inputs & outputs of a system, NOT how the inputs are converted to outputs.

Black Box Model of Water Cycle

Inputs	Outputs
Evaporation	Precipitation
Water vapor	Rain
	Snow

- positive feedback: Feedback that increases the original change
- negative feedback: decreases the original change

Name

Exploration 3: Other Chemical Cycles December 4

- biochemical cycle: the movement of chemicals through the biosphere and the geosphere.

Name

Unit 3- Natural Resources

January 22

- non renewable resource: a resource that cannot be created within a human lifespan, is used up more quickly than it can be replaced
- renewable resource: a resource that is formed as quickly as it is used up.
- sustainable: a resource that is used in the present that will be available for future generations
- fossil fuels: a nonrenewable energy source formed from the remains of organisms that lived long ago

Name

Exploration I: History of Resource Extration January 24

alloy: homogenous mixture of two or more metals.

- Why do you think people started using rock, native metals, pigments and clay earlier than they started using non native metals and alloys?
- It is easier to extract materials that are closer to where you live rather than transporting materials long distances.
- rare earth elements: certain heavy elements that react with eachother very easily.