

**Teaching Unit: 1. Inside Earth**

**Essential Understandings**

The Earth has changed and continues to change through a variety of different processes.

Plate tectonics accounts for important features of Earth's surface and major geologic events.

Forces inside Earth and at the surface produce a rock cycle that builds, destroys, and changes rocks in the crust.

Heat is transferred by radiation, convection, and conduction.

**Sub Topic: *Plate Tectonics***

**Knowledge and Skills**

Students know the theory of plate tectonics is derived from the fit of the continents; the location of earthquakes, volcanoes, and mid-ocean ridges; and the distribution of fossils, rock types, and ancient climatic zones.

Students know Earth is composed of several layers: a cold, brittle lithosphere; a hot, convecting mantle; and a dense, metallic core.

Students know continental sized plates located in the lithosphere move centimeters per year in response to movements in the mantle.

Students know that earthquakes are sudden motions along breaks in the crust called faults and that volcanoes and fissures are locations where magma reaches the surface.

Students know major geologic events, such as earthquakes, volcanic eruptions, and mountain building, result from plate motions.

Students know the significance of the "Ring of Fire."

Selected Specialized Vocabulary: radiation, convection, conduction, lithosphere, asthenosphere, divergent boundary, convergent boundary, subduction

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Teaching Unit: **2. Inside Earth**

Essential Understandings

The properties of rocks and minerals reflect the processes that formed them.

The earth changes over time.

Rocks can be differentiated (igneous, sedimentary, or metamorphic) by referring to their properties and methods of formation (the rock cycle)

Rocks are made of minerals.

Sub Topic: **Rocks and Minerals**

Knowledge and Skills

Students know the earth is in a state of continual change.

Students know the characteristics of a mineral.

Students know the three types of rock: igneous, sedimentary, and metamorphic.

Students know how the three types of rock are formed.

Students know some changes in the earth are due to slow processes, such as erosion, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.

Students know sedimentary rock contains fossils providing evidence of changing life.

Vocabulary:

mineral, gemstone

inorganic

streak

luster

crystal

Mohs hardness scale

alloy

ore

igneous, sedimentary, metamorphic

foliated

extrusive

intrusive

porphyritic

erosion

deposition

cementation

compaction

atoll

rock cycle

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Teaching Unit: **3. Earth Science**

Essential Understandings

Many phenomena on Earth's surface are affected by the transfer of energy through conduction, convection, and radiation.

Heat moves in a predictable flow from warmer objects to cooler objects until all the objects are at the same temperature.

Energy transforms from one type to another, it is not created or destroyed.

Energy sources can be categorized as renewable or non renewable.

Sub Topic: **Energy sources**

Knowledge and Skills

Students know energy can be carried from one place to another by heat flow or by waves, including water, light and sound waves, or by moving objects.

Students know that when fuel is consumed, most of the energy released becomes heat energy.

Students know heat flows in solids by conduction (which involves no flow of matter) and in fluids by conduction and by convection (which involves flow of matter).

Students know heat energy is also transferred between objects by radiation (radiation can travel through space).

Students know solar energy reaches Earth through radiation, mostly in form of visible light.

Students know heat from Earth's interior reaches the surface primarily through convection.

Students know convection currents distribute heat in the atmosphere and oceans.

Students know the differences between renewable and nonrenewable energy sources and they are able to categorize each.

Vocabulary: radiation, nuclear fission, nuclear fusion, petrochemicals, fossil fuels, hydrocarbons, petroleum, refinery, hydroelectric, geothermal,

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Teaching Unit: **4. Electricity & Magnetism**

Essential Understandings

Static and current electricity have unique characteristics.

Electricity is a form of energy in which electrons flow.

Electricity is beneficial when used safely.

Electric charges cannot be created or destroyed but only transferred from one object to another.

Electricity is a convenient energy form.

Sub Topic: **Static and Current Electricity**

Knowledge and Skills

Students know every magnet has two poles.

Students know unlike magnetic poles attract, like magnetic poles repel.

Students know Earth has a north magnetic pole and a south magnetic pole.

Students know Earth's magnetic poles are not at exactly the same location as geographic poles.

Students know electric motors and generators use electromagnets to convert one form of energy into another.

Students know conductors carry electrical charges.

Students know insulators block electrical charges.

Students know a magnetic field will always exist around a current-carrying wire.

Students know electricity is a form of energy in which electrons flow.

Students know electricity can be converted into many other forms of energy.

Selected vocabulary: magnetic field, magnetic domain, magnetic declination, atoms, protons, electrons, neutrons, nucleus, conductor, insulator, resistor, electromagnet, solenoid, magnetism

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Teaching Unit: **5. Weather**

Essential Understandings

The tilt of the Earth causes the different seasons.

The study of weather patterns will help us to accurately forecast the weather.

Sub Topic: **Forecasting**

Knowledge and Skills

Students know weather observations help to predict the weather.

Students know to look for weather patterns in collected data to make predictions.

Students know winds are caused by differences in air pressure, (the result of the unequal heating of Earth and its atmosphere).

Students know the layers of the atmosphere are classified by their characteristic temperatures.

Students know the Earth's tilt causes seasons.

Selected vocabulary: atmosphere, troposphere, stratosphere, mesosphere, thermosphere, ionosphere, exosphere, aurora borealis, ozone, precipitation, radiation, conduction, convection, anemometer, psychrometer, thermometer, barometer

Teaching Unit: **6. Earth Science**

Essential Understandings

Soils are formed through Earth's natural, changing processes.

Soils differ from one region to another.

Five factors influence soils that develop.

Sub Topic: **Soil Studies**

Knowledge and Skills

Students will be able to explain how soils are formed - using these terms: parent material, climate, organic matter, topography, and time.

Students will be able to explain why soils differ from one place to another.

Students will be able to explain what organic matter is and give examples of what might be found in organic matter.