Earth Science (8th Grade)

Unit Title: Climate Change and Energy Sources	**Duration:** 5 weeks

Objective: TLW describe the impact of humans on Earth's systems as renewable and nonrenewable resources are utilized and how human impact can lead to climate change. Students will form an opinion on climate change and support it with facts from scientific writings, which will be debated in class.

Standards: *E5.4A, E5.4C, E5.4f, E5.r4h, E5.r4j, E2.2B, E2.4A*

Literacy Activities: Close reading, Teacher/Student Think/Read Aloud, Pair and Share, Debate Summary Essay

Skills:

- Use online search engines to find quality sources of information
- Use close reading to find important facts to support a point of view
- Express opinion during debate with supporting facts

Vocabulary:

Biomass	Hydroelectric	Renewable
Coal	Oil	Solar
Energy	Natural Gas	Turbine
Fossil Fuel	Non-Renewable	Uranium
Geothermal	Nuclear	Wind

Unit Title: The atmosphere and Severe Weather	**Duration:** 4 Weeks

Objective: TLW explain how Earth's system is essentially closed and describe each part of Earth's system. TLW also describe the structure and composition of the atmosphere and explain how the hydrosphere and atmosphere affect weather patterns and how changes in atmospheric conditions can lead to severe weather.

Standards: *E2.1A, E2.1B, E2.1C, E4.3A, E4.3B, E4.3C, E4.3D, E4.3E, E4.3F, E4.3g*

Literacy Activities: Close Reading, Reading Maps, Analyzing Fronts, Weather Forecasting

Skills:

- Reading a weather map
- Forecast weather using fronts and wind patterns
- Describe interactions between the four Earth systems

Vocabulary:

adiabatic Temperature Change	drought	stationary Front
air Density	flood	stratosphere
air Pressure	forecast	thermosphere
altitude	front	tornado
blizzard	hurricane	troposphere
cold Front	mesosphere	thunderstorm
convection	occluded Front	warm Front
dew Point	relative humidity	warning
		watch

Unit Title: Nature of Science and Density	**Duration:** 4 weeks

Objective: TLW understand the nature of science and demonstrate an ability to practice scientific reasoning by applying it to the design, execution, and evaluation of scientific investigations and to generate new questions based on those investigations. This will largely be done through the investigation of density.

Standards: *E1.1A, E1.1B, E1.1C, E1.1D, E1.1E, E1.1f, E1.1g, E1.1h, E1.2A, E1.2C, E1.2D, E1.1i*

Literacy Activities:
- Close Reading
- Pair and Share

Skills:
- Using scientific instruments: Balance, graduated cylinder, ruler, digital scale, meter stick
- Calculate the volume, density and flotation line of a rectangular prism
- Determine whether an object will float or sink in water based on density

Vocabulary:

balance	graduated cylinder	milliliter
density	gram	scale
buoyancy	hypothesis (claim)	theory
centimeter	law	variable
flotation line	metric system	weight

Unit Title: Minerals, Rocks, Weathering and Erosion	**Duration:** 3 weeks

Objective: TLW explain that minerals make up rocks and use the rock cycle to explain weathering, erosion, the formation of sediments, and how rock types can change over time. Identify mineral and rock types.

Standards: *E3.1A, E3.1B, E3.1d, E3.1e*

Literacy Activities:

- Close reading
- Pair and Share
- Writing rock cycle life cycle story

Skills:

- Identify mineral and rock types

Vocabulary:

climate	fracture	nonfoliated
cleavage	hardness	non-silicate
chemical weathering	igneous	plate tectonics
color	intrusive	regional metamorphism
contact Metamorphism	luster	sedimentary
crystal size	mechanical weathering	silicate
erosion	metamorphic	streak
extrusive	metamorphism	weathering
foliation		

Unit Title: Layers of the Earth, Plate Tectonics, Earthquakes, and Volcanoes	**Duration:** 5 weeks

Objective: TLW describe the layers of the Earth, compare the composition and physical characteristics of each layer, describe the lithosphere as being made of mobile tectonic plates, and explain the relationship of plates to earthquakes and volcanoes.

Standards: *E3.2A, E3.2B, E3.2C, E3.2d, E1.2C, E1.2h, E1.2i, E1.2k, E3.3A, E3.3B, E3.3C, E3.4A, E3.4B, E3.4C, E3.4f*

Literacy Activities:

- Close reading
- Earthquake Location Activity
- Pair and Share

Skills:

- Locate earthquake with data from 3 seismic stations
- Locate tectonic plate boundaries based on earthquake location

Vocabulary:

asthenosphere	mid-ocean ridge	richter scale
composition	oceanic crust	ring of fire
continental crust	outer core	sea floor spreading
elastic rebound	plate boundary	secondary wave
fault	primary wave (p-wave)	seismology
magma	plate tectonics	subduction zone

Unit Title: Earth's History	**Duration:** 3 Weeks

Objective: TLW use geologic dating processes (relative age, index fossils, and radioactive dating) to explain how the Earth has changed through time.

Standards: *E5.3B, E5.3C, E5.3D, E5.3e, E5.3f, E5.3g*

Literacy Activities:

- Close Reading
- Pair and Share
- Geologic dating activity

Skills:

- Interpreting charts and graphs
- Determine relative age based on rock layers
- Calculate half-life of given radioactive substance

Vocabulary:

absolute dating carbon-14 cretaceous-tertiary geologic time scale half-life	index fossil law of superposition radioactive decay radioactive element	radiometric dating radioactive isotope superposition unconformity

Unit Title: The Water Cycle and The Fluid Earth	**Duration:** 5 Weeks

Objective: TLW explain how water moves through the atmosphere, hydrosphere, and geosphere and how water resources are important to and impacted by humans as well as explain how the Sun and rotation of the Earth control global atmospheric and oceanic circulation.

Standards: *E4.1A, E4.1B, E4.1C, E4.2A, E4.2B, E4.2c, E4.2d, E4.2e, E4.2f, E4.r2g*

Literacy Activities:

- Close Reading
- Pair and Share
- From Rainwater to Ocean

Skills:

- Identify differences in surface temperature across the globe
- Determine weather differences due to ocean currents

Vocabulary:

aquifer	el niño-southern oscillation	prevailing winds
continental climate	infiltration	recharge
convection current	maritime climate	reservoir
coriolis effect	output	seawater density and salinity
current	permeability	water budget
deep water ocean current	porosity	water table

Unit Title: The Big Bang, Our Solar System, and Stars	**Duration:** 5 Weeks

Objective: TLW explain how the solar system and universe formed and evolved, how celestial bodies impact the Earth, and how stars evolve and generate energy.

Standards: *E1.2i, E1.2k, E5.1b, E5.1A, E5.1c, E5.1d, E5.2A, E5.2B, E5.2C, E5.2D, E5.2e, E5.2f, E5.2g, E5.2h, E5.3A*

Literacy Activities:
- Close Readings
- Pair and Share
- Create Hertzsprung-Russell Diagram

Skills:
- Interpret Hertzsprung-Russell Diagram
- Explain the evolution of our solar system
- Identify various types of stars
- Explain evidence for the Big Bang

Vocabulary:

age of the universe	Hertzsprung-Russell	star age
astronomical unit	life cycle of stars	star brightness
aurora	light year	star evolution
big bang theory	nebula	star temperature
Copernicus	nuclear fusion	star types
cosmic background radiation	solar flare	Sun's radiation
doppler effect	solar system formation	sunspot
helium	solar wind	sunspot cycle
hydrogen	speed of light	