7th Grade
Science Curriculum

Earth Science

Grade 7 Curriculum Description

The grade 7 curriculum comprises topics in Earth Science as outlined in the following pages. Included are suggested labs, demos, literacy and group activities.

It should be understood that the scientific method, lab safety and knowledge of lab equipment must be integrated in the unit where appropriate. We have included experimentation in most units and a research/debate activity in the weather unit, however these standard requirements could be satisfied within any unit the teacher chooses.

The suggested important vocabulary listed in the outline includes words that are not associated with the content in this unit but are necessary for student learning. These words meet the common core literacy standards for building tier 2 and 3 vocabulary. It was assumed the teacher is familiar with the content vocabulary that would need to be taught so we did not include them in the curriculum guide for 7th grade.

Below is an estimate of the approximate time allotment for each unit.

Astronomy Unit – 4 weeks

Weather Unit – 7 weeks

Rocks and Minerals Unit/Weathering and Erosion Unit – 7 weeks

Plate Tectonics, Earthquakes and Volcanoes – 6 weeks

Topographic Maps/Longitude and latitude – 2.5 weeks

Density – 2.5 weeks

Scientific method/student designed experiment and implementation, research paper and debate – 5 weeks

Note: info was extracted from **: http://www.corestandards.org/ELA-Literacy/RST/6-8/#CCSS.ELA-Literacy.RST.6-8.7 & http://www.p12.nysed.gov/ciai/mst/sci/documents/intersci.pdf**

ASTRONOMY

STANDARD 4: The Physical Setting

Key Idea 1:

The Earth and celestial phenomena can be described by principles of relative motion and perspective.

Tier 2 Vocabulary

revolve	**revolution**	**rotation**	**Orbit**	**celestial**	**cyclic**	**horizon**	**Axis**	**spherical.**
predictable	**circular**	**accelerate**						

Tier 3 Vocabulary

orbit	Revolution	Polaris	Galaxy	Solar system
Moon phases	Solar eclipse	Lunar eclipse	Tides	Day
Month	Year	star	23 1/2 ^{o}tilt	Comets
Moons	Asteroids	Asteroid belt	Gravity	Meteor showers
Latitude	Longitude	Coordinate system	Hubble telescope	Space probe
Hadron Particle accelerator	season			

PERFORMANCE INDICATOR 1.1

Explain daily, monthly, and seasonal changes on Earth

Process Skills:

measure the angular elevation of an object, using appropriate instruments

Major Understandings:

1.1a Earth's Sun is an average-sized star. The Sun is more than a million times greater in volume than Earth.

1.1b Other stars are like the Sun but are so far away that they look like points of light. Distances between stars are vast compared to distances within our solar system.

1.1c The sun and the planets that revolve around it are the major bodies in the solar system. Other members include comets, moons, and asteroids. Earth's orbit is nearly circular.

1.1d Gravity is the force that keeps planets in orbit around the sun and the moon in orbit around the earth

1.1e Most objects in the solar system have a regular and predictable motion. These motions explain such phenomenon as a day, a year, phases of the moon, eclipses, tides, meteor showers and comets

1.1f The latitude/longitude coordinate system and our system of time are based on celestial observations. (see process skill for this unit)

1.1g Moons are seen by reflected light. Our moon orbits earth, while the earth orbits the sun. The moons phases as observed from Earth are the result of seeing different portions of the lighted area of the moon's surface. The phases repeat in a cyclic pattern in about one month.

1.1h The apparent motions of the sun, moon, planets, and stars across the sky can be explained by Earth's rotation and revolution. Earth's rotation causes the length of one day to be approximately 24 hours. This rotation also causes the sun and moon to appear to rise along the eastern horizon and to set along the western horizon. Earth's revolution around the sun defines the length of the year as 365 ¼ days.

1.1i The tilt of the Earth's axis of rotation and the revolution of Earth around the sun cause seasons on Earth. The length of daylight varies depending on latitude and season.

1.1j The shape of Earth, the other planets, other stars is nearly spherical.

4.1a The Sun is a major source of energy for Earth in the form of radiation. Other sources of energy include nuclear and geothermal energy.

Labs:

Astrolabe Lab – Height above horizon to locate Polaris.

Seasons demo with projector globe

Phases of the Moon demo with projector and black globe

Explaining how scientists determined the sun is at the center of our solar system using planet retrograde demo.

Seasons, months, years demo

The tilt of the Earth at 23.5 degrees causing seasonal variations in length of day - demo

Expanded Process Skills:

STANDARD 1—Analysis, Inquiry, and Design

M1.1b identify relationships among variables including: direct, indirect, cyclic, constant; identify non-related material

Seasons demo with projector globe
Phases of the Moon demo with projector and black globe.

M2.1 Use inductive reasoning to construct, evaluate, and validate conjectures and arguments, recognizing that patterns and relationships

Explaining how scientists determined the sun is at the center of our solar system using planet retrograde demo.

M2.1b quantify patterns and trends

Seasons, months, years demo

M3.1 Apply mathematical knowledge to solve real-world problems and problems that arise from the investigation of mathematical ideas, using representations such as pictures, charts, and tables.

The tilt of the Earth at 23.5 degrees causing seasonal variations in length of day - demo

CCLS- Literacy

CCSS.ELA-LITERACY.RST.6-8.2

Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions

CCSS.ELA-LITERACY.RST.6-8.6

Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.

Read Articles about the History of Astronomers and their discoveries; Gallileo, Copernicus, Newton,Kepler

News Articles about current data from space probes , space station , rover etc.

WEATHER (including Weathering and Erosion)

STANDARD 4: The Physical Setting

Key Idea 2:

Many of the phenomena that we observe on Earth involve interactions among components of air, water, and land

Tier 2 Vocabulary

stratified	properties	lithosphere	hydrosphere	altitude	prevailing	stationary	Primarily
Density	thermal	gradual	stratified	Distinct	properties	pressure	Radiation
circulates	continuous	interact	Heat exchange	predicable	collisions	contract	Transferred
absorbed	released						

Tier 3 Vocabulary

Atmosphere	Troposphere	Stratosphere	Mesosphere	Thermosphere
Exosphere	Aurora borealis/australis	Ozone	Nitrogen	Oxygen
Global warming	Green house effect	Heat vs. temperature	Convection	Conduction
Radiation	Climate vs. weather	Fronts: cold, warm, occluded, stationary	Coriolis effect	Global winds vs local winds
Westerlies	Trade winds	Doldrums	Polar easterlies/westerleis	Horse latitudes
Latitude	Longitude	Hydrosphere	Currents vs. wind	Ocean currents
Temperature gradient	Condensation	Transpiration	Water cycle	Precipitation
hail formation	Evaporation	Phase changes	Exothermic	Endothermic
Humidity	Wind chill	air pressure	Barometric pressure	Isobar/line maps
Anemometer	Pyschrometer	Wind vane	Dew point	Saturation
Hurricane	Tornadoes	Thunderstorm	Cumulus	Cirrus clouds
Stratus clouds	Relative humidity			

Performance Indicator 2.1
Explain how the atmosphere (air), hydrosphere (water), and lithosphere (land) interact, evolve, and change.

Process Skills:

Safely and accurately use a thermometer.

Use appropriate units for measured or calculated values.

Recognize and analyze patterns and trends.

Sequence events.

Identify cause and effect relationships.

Use indicators and interpret results.

Generate and interpret topographic and weather field maps.

Predict the characteristics of an air mass based on the origin of the air mass.

Measure weather variables such as wind speed and direction, relative humidity, barometric pressure, etc.

Given the latitude and longitude of a location, indicate its position on a map and determine the latitude and longitude of a given location on a map

Major Understandings:

2.1a Nearly all the atmosphere is confined to a thin shell surrounding Earth. The atmosphere is a mixture of gases, including nitrogen and oxygen with small amounts of water vapor, carbon dioxide, and other trace gases. The atmosphere is stratified into layers, each having distinct properties. Nearly all weather occurs in the lowest layer of the atmosphere.

2.1b As altitude increases, air pressure decreases.

2.1c The rock at Earth's surface forms a nearly continuous shell around Earth called the lithosphere.

2.1d The majority of the lithosphere is covered by a relatively thin layer of water called the hydrosphere.

Weathering and Erosion:

2.1g The dynamic processes that wear away EarthÕs surface include weathering and erosion.

2.1h The process of weathering breaks down rocks to form sediment. Soil consists of sediment, organic material, water, and air.

2.1i Erosion is the transport of sediment. Gravity is the driving force behind erosion. Gravity can act directly or through agents such as moving water, wind, and glaciers.

2.1j Water circulates through the atmosphere, lithosphere, and hydrosphere in what is known as the water cycle

Performance Indicator 2.2

Describe weather and climate changes

Process Skills:

Safely and accurately use a thermometer.

Use appropriate units for measured or calculated values.

Recognize and analyze patterns and trends.

Sequence events.

Identify cause and effect relationships.

Use indicators and interpret results.

Generate and interpret topographic and weather field maps.

Predict the characteristics of an air mass based on the origin of the air mass.

Measure weather variables such as wind speed and direction, relative humidity, barometric pressure, etc.

Given the latitude and longitude of a location, indicate its position on a map and determine the latitude and longitude of a given location on a map

Major Understandings:

2.2i Weather describes the conditions of the atmosphere at a given location for a short period of time.

2.2j Climate is the characteristic weather that prevails from season to season and year to year.

2.2k The uneven heating of Earth's surface is the cause of weather.

2.2l Air masses form when air remains nearly stationary over a large section of Earth's surface and takes on the conditions of temperature and humidity from that location.

Weather conditions at a location are determined primarily by temperature, humidity, and pressure of air masses over that location.

2.2m Most local weather condition changes are caused by movement of air masses.

2.2n The movement of air masses is determined by prevailing winds and upper air currents.

2.2o Fronts are boundaries between air masses. Precipitation is likely to occur at these boundaries.

2.2p High-pressure systems generally bring fair weather. Low-pressure systems usually bring cloudy, unstable conditions. The general movement of highs and lows is from west to east across the United States.

2.2q Hazardous weather conditions include thunderstorms, tornadoes, hurricanes, ice storms, and blizzards. Humans can prepare for and respond to these conditions if given sufficient warning.

2.2r Substances enter the atmosphere naturally and from human activity. Some of these substances include dust from volcanic eruptions and greenhouse gases such as carbon dioxide, methane, and water vapor. These substances can affect weather, climate, and living things.

Key Idea 3:
Matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity.

Performance Indicator 3.1
Observe and describe properties of materials

Process Skills:

Safely and accurately use a thermometer.

Use appropriate units for measured or calculated values.

Recognize and analyze patterns and trends.

Sequence events.

Identify cause and effect relationships.

Use indicators and interpret results.

Generate and interpret topographic and weather field maps.

Predict the characteristics of an air mass based on the origin of the air mass.

Measure weather variables such as wind speed and direction, relative humidity, barometric pressure, etc.

Given the latitude and longitude of a location, indicate its position on a map and determine the latitude and longitude of a given location on a map

Major Understandings:

3.1c The motion of particles helps to explain the phases (states) of matter as well as changes from one phase to another. The phase in which matter exists depends on the attractive forces among its particles.

Key Idea 4:
Energy exists in many forms, and when these forms change energy is conserved.

Performance Indicator 4.1
Describe the sources and identify the transformations of energy observed in everyday life.

Process Skills:

Safely and accurately use a thermometer.

Use appropriate units for measured or calculated values.

Recognize and analyze patterns and trends.

Sequence events.

Identify cause and effect relationships.

Use indicators and interpret results.

Generate and interpret topographic and weather field maps.

Predict the characteristics of an air mass based on the origin of the air mass.

Measure weather variables such as wind speed and direction, relative humidity, barometric pressure, etc.

Given the latitude and longitude of a location, indicate its position on a map and determine the latitude and longitude of a given location on a map

Major Understandings:

4.1a The Sun is a major source of energy for Earth. Other sources of energy include nuclear and geothermal energy.

Performance Indicator 4.2:
Observe and describe heating and cooling events.

Process Skills:

Safely and accurately use a thermometer.

Use appropriate units for measured or calculated values.

Recognize and analyze patterns and trends.

Sequence events.

Identify cause and effect relationships.

Use indicators and interpret results.

Generate and interpret topographic and weather field maps.

Predict the characteristics of an air mass based on the origin of the air mass.

Measure weather variables such as wind speed and direction, relative humidity, barometric pressure, etc.

Given the latitude and longitude of a location, indicate its position on a map and determine the latitude and longitude of a given location on a map

Major Understandings:

4.2a Heat moves in predictable ways, flowing from warmer objects to cooler ones, until both reach the same temperature

4.2b Heat can be transferred through matter by the collisions of atoms and/or molecules (conduction) or through space (radiation). In a liquid or gas, currents will facilitate the transfer of heat (convection).

4.2c During a phase change, heat energy is absorbed or released. Energy is absorbed when a solid changes to a liquid and when a liquid changes to a gas. Energy is released when a gas changes to a liquid and when a liquid changes to a solid.

4.2d Most substances expand when heated and contract when cooled. Water is an exception, expanding when changing to ice.

Labs:

Karen's Cloud in a Bottle
Air Pressure Demo- Egg in a bottle, coke can heated and cooled in an aquarian, cups, bell jar with balloons and marshmallows
Relative Humidity Use Psychrometers
Dew Point Lab
Making Anemometers
Make Barometers
Black Globe Coriolus effect demo
Convection Current demo- food coloring in a beaker of boiling water

Station Model Map Reading
Plotting and isobars
Plotting Hurricance movement

Global Warming Research, Write a paper, debate and "On the Fence" activity.

Multi-Station Lab on severe weather events

Extended Process Skills:

STANDARD 6 Interconnectedness MODELS:

2.2 Use models to study processes that cannot be studied directly (e.g., when the real process is too slow, too fast, or too dangerous for direct observation).

Karen's Cloud in a Bottle
Air Pressure Demo- Egg in a bottle, coke can heated and cooled in an aquarian, cups, bell jar with balloons and marshmallows
Relative Humidity Use Psychrometers
Dew Point Lab
Making Anemometers
Make Barometers
Black Globe Coriolis effect demo
Convection Current demo- food coloring in a beaker of boiling water

STANDARD 6 Interconnectedness Patterns of Change:

Identifying patterns of change is necessary for making predictions about future behavior and conditions.

5.2 Observe patterns of change in trends or cycles and make predictions on what might happen in the future.

Station Model Map Reading
Plotting and isobars
Plotting Hurricane movement

STANDARD 6 Interconnectedness Optimization and Standard 7 Problem Solving Connections

In order to arrive at the best solution that meets criteria within constraints, it is often necessary to make trade-offs.

Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions

Global Warming Research, Write a paper, debate and "On the Fence" activity.

CCLS –Literacy

CCSS.ELA-LITERACY.RST.6-8.1

Cite specific textual evidence to support analysis of science and technical texts.

CCSS.ELA-LITERACY.RST.6-8.2

Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

CCSS.ELA-LITERACY.RST.6-8.8

Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

CCSS.ELA-LITERACY.RST.6-8.9

Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

Global Warming Research, Write a paper, debate and "On the Fence" activity.

Multi-Station Lab on severe weather events

CCSS.ELA-LITERACY.RST.6-8.10

By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

Use Text book to read and answer questions about weather topics.

ROCKS AND MINERALS

STANDARD 4: The Physical Setting

Key Idea 2: **Many of the phenomena that we observe on Earth involve interactions among components of air, water, and land**

Tier 2 Vocabulary

lithosphere	formation	characteristics	physical properties	transformed	dynamic processes	Stratified
Melting	Solidification	Sedimentation	Sediment	Deposition	Compaction	Compression

Tier 3 Vocabulary

mineral	Luster	Hardness	Rock	Acid test
Cleavage	Density	Chemical composition	Stratification	Superposition
Weathering	Erosion	Crystal	Igneous	Metamorphic
Sedimentary	Conglomerate	Fossil	Rock cycle	metamorphism

Performance indicator 2.1

Explain how the atmosphere (air), hydrosphere (water), and lithosphere (land) interact, evolve, and change.

Process Skills:

Using identification tests and a flow chart, identify mineral samples

Use a diagram of the rock cycle to determine geological processes that led to the formation of a specific rock type

Recognize and analyze patterns and trends.

Sequence events.

Identify cause and effect relationships.

Use indicators and interpret results.

Generate and interpret topographic and weather field maps.

Classify objects according to an established scheme and a student-generated scheme

Use a dichotomous key

Using identification tests and a flow chart, identify mineral samples

Use a diagram of the rock cycle to determine geological processes that led to the formation of a specific rock type

Major Understandings:

2.1a Nearly all the atmosphere is confined to a thin shell surrounding Earth. The atmosphere is a mixture of gases, including nitrogen and oxygen with small amounts of water vapor, carbon dioxide, and other trace gases. The atmosphere is stratified into layers, each having distinct properties. Nearly all weather occurs in the lowest layer of the atmosphere.

2.1b As altitude increases, air pressure decreases.

2.1c The rock at Earth's surface forms a nearly continuous shell around Earth called the lithosphere.

2.1d The majority of the lithosphere is covered by a relatively thin layer of water called the hydrosphere.

2.1e Rocks are composed of minerals. Only a few rock-forming minerals make up most of the rocks of Earth. Minerals are identified on the basis of physical properties such as streak, hardness, and reaction to acid.

2.1f Fossils are usually found in sedimentary rocks. Fossils can be used to study past climates and environments.

2.1g The dynamic processes that wear away Earth's surface include weathering and erosion.

2.1h The process of weathering breaks down rocks to form sediment. Soil consists of sediment, organic material, water, and air.

2.1i Erosion is the transport of sediment. Gravity is the driving force behind erosion. Gravity can act directly or through agents such as moving water, wind, and glaciers.

2.1j Water circulates through the atmosphere, lithosphere, and hydrosphere in what is known as the water cycle.

Performance Indicator 2.2:

Describe volcano and earthquake patterns, the rock cycle, and weather and climate changes.

2.2c Folded, tilted, faulted, and displaced rock layers suggest past crustal movement.

2.2g Rocks are classified according to their method of formation. The three classes of rocks are sedimentary, metamorphic, and igneous. Most rocks show characteristics that give clues to their formation conditions.

2.2h The rock cycle model shows how types of rock or rock material may be transformed from one type of rock to another.

Weathering and Erosion:

2.1g The dynamic processes that wear away Earth's surface include weathering and erosion.

2.1h The process of weathering breaks down rocks to form sediment. Soil consists of sediment, organic material, water, and air.
2.1i Erosion is the transport of sediment. Gravity is the driving force behind erosion. Gravity can act directly or through agents such as moving water, wind, and glaciers.

Labs:

Mineral Testing Lab
Mineral Flow Chart Lab
Rock Lab

Weathering Labs- 3 different rock classifications- Which rock weathers fastest Physically? Chemically?
Use small samples of rocks and water
Use small samples of rocks and HCL

Val's Mineral Intro- 12 minerals and a book.
Karen's Iggy Igneous story.

Expanded Process Skills:

STANDARD 1 Analysis, Inquiry, and Design SCIENTIFIC INQUIRY: Beyond the use of reasoning and consensus, scientific inquiry involves the testing of proposed, explanations involving the use of conventional techniques and procedures and usually, requiring considerable ingenuity(see S2.1- S2.3

S2.1 Use conventional techniques and those of their own design to make further observations and refine their explanations, guided by a need for more information.

Mineral Testing Lab
Mineral Flow Chart Lab
Rock Lab

S2.1a demonstrate appropriate safety techniques
S2.1b conduct an experiment designed by others,
S2.1c design and conduct an experiment to test a hypothesis
S2.1d use appropriate tools and conventional techniques to solve problems about the natural world, including: measuring, observing, describing, classifying, sequencing

Weathering Labs- 3 different rock classifications- Which rock weathers fastest Physically? Chemically?
Use small samples of rocks and water
Use small samples of rocks and HCL

CCLS- Literacy

CCSS.ELA-LITERACY.RST.6-8.10
By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.

CCSS.ELA-LITERACY.RST.6-8.6
Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.

Val's Mineral Intro- 12 minerals and a book.

Karen's Iggy Igneous story.

CCSS.ELA-LITERACY.RST.6-8.3

Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

CCSS.ELA-LITERACY.RST.6-8.7

Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

Mineral Testing Lab
Mineral Flow Chart Lab
Rock Lab
Create a desktop graphic organizer for rock unit.

CCSS.ELA-LITERACY.RST.6-8.9

Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

Read article and show video of Mexican selenite crystal cave and compare with other cave construction articles.

PLATE TECTONICS, EARTHQUAKES, VOLCANOES

STANDARD 4: The Physical Setting

Key Idea 2: Many of the phenomena that we observe on Earth involve interactions among components of air, water, and land

Tier 2 Vocabulary:

vibrational	interior	Earthquake	Volcano	collide
molten	crustal	displaced	Primary	Secondary
sequence				

Tier 3 Vocabulary:

Subduction	Transverse	Convergent	Divergent	Plate tectonics
Tsunami	Seismic waves	Seismology	Pangea	Folded
Faulted	tilted	Epicenter	S and P waves	Richter scale
Fossils	convection	Magma	lava	Cinder Cone Volcano
Composite Volcano	Shield Volcano	Mt. St. Helen	Krakatoa	Super position

Performance Indicator 2.2:
Describe volcano and earthquake patterns, the rock cycle, and weather and climate changes.

Process Skills:

recognize and analyze patterns and trends

plot the location of recent earthquake and volcanic activity on a map and identify patterns of distribution

sequence events

identify cause-and-effect relationships

use indicators and interpret results

Major Understandings:

2.2a The interior of Earth is hot. Heat flow and movement of material within Earth cause sections of Earth's crust to move. This may result in earthquakes, volcanic eruption, and the creation of mountains and ocean basins.

2.2b Analysis of earthquake wave data (vibrational disturbances) leads to the conclusion that there are layers within Earth. These layers in the crust, mantle, outer core, and inner core have distinct properties.

2.2c Folded, tilted, faulted, and displaced rock layers suggest past crustal movement.

2.2d Continents fitting together like puzzle parts and fossil correlations provided initial evidence that continents were once together.

2.2e The Theory of Plate Tectonics explains how the solid lithosphere consists of a series of plates that float on the partially molten section of the mantle. Convection cells within the mantle may be the driving force for the movement of the plates.

2.2f Plates may collide, move apart, or slide past one another. Most volcanic activity and mountain building occur at the boundaries of these plates, often resulting in earthquakes.

Labs:

Plotting earthquakes and volcanoes

Plate Tectonics Continent Fossil Activity

Need lab for Rock Superposition using fossil evidence

Coloring Activity to illustrate metamorphic rock folding.

Rate of Plate Movement Study
Distance of the epicenter using s and p wave calculations.

Expanded Process Skills:

STANDARD 1 Analysis, Inquiry, and Design, SCIENTIFIC INQUIRY:

S3.1a organize results, using appropriate graphs, diagrams, data tables, and other models to show relationships

Plotting earthquakes and volcanoes

STANDARD 6- Interconnectedness: Common Themes PATTERNS OF CHANGE:
Identifying patterns of change is necessary for making predictions about future behavior and conditions.
5.2 Observe patterns of change in trends or cycles and make predictions on what might happen in the future.

STANDARD 6 Interconnectedness: Common Themes MODELS:

2.2 Use models to study processes that cannot be studied directly (e.g., when the real process is too slow, too fast, or too dangerous for direct observation).

Plate Tectonics Continent Fossil Activity

Need lab for Rock Superposition using fossil evidence

Coloring Activity to illustrate metamorphic rock folding.

STANDARD 7 Interdisciplinary Problem Solving CONNECTIONS:
The knowledge and skills of mathematics, science, and technology are used together to make informed decisions and solve problems, especially those relating to issues of science/ technology/society, consumer decision making, design, and inquiry into

phenomena.

1.1 Analyze science/technology/society problems and issues at the local level and plan and carry out a remedial course of action.

Rate of Plate Movement Study
Distance of the epicenter using s and p wave calculations.

CCLS Literacy/Math

Rate of Plate Movement Study
Distance of the epicenter using s and p wave calculations.

CCSS.ELA-LITERACY.RST.6-8.9
Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

Hat Strategy for comparing information about earthquake events, tsunami events, volcano events. Include articles about Mount St. Helens, Indonesian Tsunami, Japanese Tsunami, Yellowstone Mega Volcano etc

TOPOGRAPHIC MAPS & LATITUDE AND LONGITUDE

STANDARD 4: The Physical Setting

(Recommended to teach by connecting to weather unit)

Key Idea 1: The Earth and celestial phenomena can be described by principles of relative motion and perspective.

Tier 2 Vocabulary:

coordinates	**cardinal directions**	**slope**	**gradual**	**steep**	**horizon**	**horizontal**	**vertical**
Longitude	**Latitude**		**Sea level**	**Depth**	**Steep**	**Gradual**	**incline**

Tier 3 Vocabulary:

Contour	**Contour interval**	**Gradient**	**Tropic of cancer**	**Tropic of capricorn**
Elevation vs. distance	**topographic**			

PERFORMANCE INDICATOR 1.1: Explain daily, monthly, and seasonal changes on Earth.
Major Understandings:

Process Skills

Given the latitude and longitude of a location, indicate its position on a map and determine the latitude and longitude of a given location on a map.

Plot the location of recent earthquake and volcanic activity on a map and identify patterns of distribution

Use a magnetic compass to find cardinal directions.

Generate and interpret field maps including topographic and weather maps

Major Understandings:

1.1f The latitude/longitude coordinate system and our system of time are based on celestial observations.

1.1i The length of daylight varies depending on latitude and season

Labs:

Finding the latitude and longitude of world land formations lab.

Use quadrangle topographic maps to answer questions about landforms-lab.

Plotting earthquakes and volcanoes-lab

Building a model of a landform using a potato lab, and the cardboard lab.

Expanded Process Skills:

STANDARD 1—Analysis, Inquiry, and Design

M2.1a Interpolate and extrapolate from data

S2.1d use appropriate tools and conventional techniques to solve problems about the natural world, including: • measuring, observing, describing, classifying, sequencing

Finding the latitude and longitude of world land formations lab.

Use quadrangle topographic maps to answer questions about landforms-lab.

S3.1a organize results, using appropriate graphs, diagrams, data tables, and other models to show relationships

Plotting earthquakes and volcanoes-lab

S3.1b generate and use scales, create legends, and appropriately label axes

Building a model of a landform using a potato lab, & the cardboard lab.

DENSITY

STANDARD 4: The Physical Setting

Key Idea 3: Matter is made up of particles whose properties determine the observable characteristics of matter and its reactivity.

Tier 2 Vocabulary:

Expand	Comparative	dense		

Tier 3 Vocabulary:

X axis	Y axis	Mass	Volume	Displacement method
Triple beam balance	Overflow can	Cubic centimeters	Milliliters	

Performance Indicator 3.1:

Observe and describe properties of materials, such as density, conductivity, and solubility.

Process Skills:

Determine the density of liquids, and regular- and irregular-shaped solids- Use lab work

Determine the volume of a regular- and an irregular-shaped solid, using water displacement- Use Lab work

Major Understandings:

3.1h Density can be described as the amount of matter that is in a given amount of space. If two objects have equal volume, but one has more mass, the one with more mass is denser.

3.1i Buoyancy is determined by comparative densities.

Performance Indicator 4.2:

Observe and describe heating and cooling events.

Process Skills:

Determine the density of liquids, and regular- and irregular-shaped solids- Use lab work

Determine the volume of a regular- and an irregular-shaped solid, using water displacement- Use Lab work

Major Understandings:

4.2d Most substances expand when heated and contract when cooled. Water is an exception, expanding when changing to ice.

Labs:

Work sheets that practice finding single variable values using the density formula.

Use Karen's multi-station lab that shows the relationships between volume and mass of uniform and non-uniform substances.

Density by displacement lab

Density by measurement lab

Expanded Process Skills:

STANDARD 1 Analysis, Inquiry, and Design

M1.1 Extend mathematical notation and symbolism to include variables and algebraic expressions in order to describe and compare quantities and express mathematical relationships.

M1.1b identify relationships among variables including: direct, indirect, cyclic, constant; identify non-related material

M1.1c apply mathematical equations to describe relationships among variables in the natural world

Work sheets that practice finding single variable values using the density formula.

Use Karen's multi-station lab that shows the relationshops between volume and mass of uniform and non-uniform substances.

CCLS Literacy/Math

CCSS.ELA-LITERACY.RST.6-8.6

Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text