Introduction Enduring Understandings: Calculate Density & apply its affects to system behavior Calculate % Error Know & apply water's density anomaly	Content Outcomes	Standards-Based Essential Skills Standard 1 Key Idea 1: Using abstraction and symbolic representation to communicate mathematically Standard 6 Key Idea 4: Apply concept of dynamic equilibrium to describe Earth systems Key Idea 5: Identifying patterns of change for making predictions	Strategies to Teach Skills & Concepts Class Notes Reference Table Practice Homework practice Lab exercises Calculate D, M, & V with density equation Calculate % Error Measure mass, length, vol, time with appropriate instruments	Resources Labs	I-1A Graphing I-1 Observation & Measurement I-2 Density
Assessments: Formative: Intro Homework	Literacy Stds	Reading Standards R.1Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. R.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. R.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. And others as applicable.	Writing Standards W.2 Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. W.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. W.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. W.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences. W.7 Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation	Video, ppt	
Summative: Intro Exam	Vocabulary	Tier 2: Observation Inference Classification Measurement Calculate	Tier 3: Model Atmosphere Geosphere Hydrosphere Biosphere Mass Percent Error (Percent Deviation) Density Volume Instrument Dynamic Equilibrium	Web	
Time Frame: September (2 Weeks)		Review:	Notes:	Misc	

Unit 1: Measuring the Earth Enduring Understandings: Describe Earth size & shape Use Latitude, Longitude, & Time Apply Mapping skill to landscape analysis	Content Outcomes	Standards-Based Essential Skills	Strategies to Teach Skills & Concepts	Resources	
		Standard 1 Key Idea 3: Critical thinking skills are used in the solution of mathematical problems. Standard 6 Key Idea 2: Use models in analysis, explanation, interpretation, or design. Key Idea 3: Group magnitudes into a series of relative order to see the immense range and the changes in scale of systems. Standard 4 Indicator 1.1c: system of latitude and longitude is based upon Earth's rotation andobservation of the Sun and stars. Indicator 1.1d: Earth rotation provides a basis for our system of local time Indicator 2.1q Topographic maps represent landforms through the use of contour lines. Gradients and profiles can be determined from changes in elevation over a given distance.	Class Notes Reference Table Practice Homework practice Lab exercises Identify Locations using latitude & longitude Analyze various maps for geographic and field properties by applying map skills (contour lines, gradients, profiles, etc)	Labs	1-1 NYS Latitude & Longitude 1-2 Contour Maps 1-3 Intro to GPS
Assessments: Formative: Unit 1 Homework	Literacy Stds	Reading Standards R.1Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. R.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. R.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. And others as applicable.	Writing Standards W.2 Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. W.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. W.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. W.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences. W.7 Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.	Video, ppt	Images of Earth ppt
		Tier 2:	Tier 3:		

Summative: Unit 1 Exam	Vocabulary	Rate of Change Slope Magnitude	Oblate sphere Elevation Altitude Lithosphere Geographic Latitude Longitude Prime Meridian Topography Isoline Gradient Contour line	Web	
Time Frame: September (2 Weeks)		Review:	Notes:	Misc	

Unit 2: Rocks & Minerals Enduring Understandings: Determine mineral formation and properties Name & classificy Rocks by formation process Summarize regional and global natural resource	Content Outcomes	Standards-Based Essential Skills	Strategies to Teach Skills & Concepts	Resources	
		Standard 4 Indicator 3.1a: Minerals have physical properties determined by their chemical composition and crystal structure Indicator 3.1b Minerals are formed inorganically bycrystallization processes by specific environmental conditions. Indicator 3.1c: Rocks are composed of one or more minerals	Class Notes Reference Table Practice Homework practice Lab exercises Investigations: Minerals ID by assessing physical & chemical properties Rock ID & B classify as ig, metam, or sed from color, texture, and structure	Labs	2-1 Mineral ID 2-2 Rock ID
Assessments: Formative: Unit 2 Homework	Literacy Stds	Reading Standards R.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. R.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. R.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. And others as applicable.	Writing Standards W.2 Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. W.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. W.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. W.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences. W.7 Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.	Video, ppt	Rock & mineral hand samples
Summative: Rock & Mineral ID Quiz Unit 2 Exam	Vocabulary	Tier 2: Cleave Fracture Organic	Tier 3: Mineral Streak Luster Rock Igneous Rocks Magma Lava Solidification Vesicular Crystalline Intrusive Extrusive Metamorphic Rocks Foliated Recrystallization Sedimentary Rocks Cementation Compaction Clastic	Web	
Time Frame: October (3 Weeks)		Review:	Notes:	Misc	

Unit 3: Weathering, Erosion, & Deposition		Standards-Based Essential Skills	Strategies to Teach Skills & Concepts	Resources	
Enduring Understandings: Describe mechanical & physical weathering Compare & contrast affects of erosion & deposition by running water, wind, gravity	Content Outcomes	Standard 4 Indicator 2.1s: Weathering is the physical and chemical breakdown of rocks at or near Earth's surface. Soils are the result of weathering and biological activity over long periods of time. Indicator 2.1t: Natural agents of erosion, generally driven by gravity, remove, transport, and deposit weathered rock particles. Indicator 2.1u: The natural agents of erosion include: Streams (running water), Wind Erosion, Mass Movement Indicator 2.12.1v Patterns of deposition result from a loss of energy within the transporting system and are influenced by the size, shape, and density of the transported particles. Indicator 2.12.1 2.1w Sediments of inorganic and organic origin often accumulate in depositional environments.	Class Notes Reference Table Practice Homework practice Lab exercises Investigations: Sandstone abrasion Chem weathering & prtcl size Erosion & dep by wind & gravity	Labs	3-1 Erosion by Water 3-2 Chemical Weathering 3-3 Settling Rates 3-4 Sediment Analysis
Assessments: Formative: Unit 3 Homework	Literacy Stds	Reading Standards R.1Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. R.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. R.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. And others as applicable.	Writing Standards W.2 Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. W.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. W.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. W.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences. W.7 Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.	Video, ppt	Video: Mysteries Underground
Summative: Unit 3 Exam	Vocabulary	Tier 2: Soil Basin Horizontal Vertical Graded Dynamic Equilibrium	Tier 3: Transported soil Residual soil Erosion Deposition Watershed Drainage basin Glacier Saltation Sediment Stream bed Graded bedding Horizontal sorting Discharge	Web	
Time Frame: November (3 weeks)		Review:	Notes:	Misc	

Unit 4: Glaciers, Coasts, Landscapes Enduring Understandings: Analyze erosion/deposition patterns of glaciers Identify NYS, NH, Global evidence of past galciation Differentiate between stages of landscape devel due to erosion, etc Identify NYS, NH, Global landscape regions	Content Outcomes	Standards-Based Essential Skills	Strategies to Teach Skills & Concepts	Resources	
		Standard 4 Indicator 2.1s: Weathering is the physical and chemical breakdown of rocks at or near Earth's surface. Soils are the result of weathering and biological activity over long periods of time. Indicator 2.1t: Natural agents of erosion, generally driven by gravity, remove, transport, and deposit weathered rock particles. Indicator 2.1u: The natural agents of erosion include: Streams (running water), Wind Erosion, Mass Movement Indicator 2.12.1v Patterns of deposition result from a loss of energy within the transporting system and are influenced by the size, shape, and density of the transported particles. Indicator 2.12.1 2.1w Sediments of inorganic and organic origin often accumulate in depositional environments.	Class Notes Reference Table Practice Homework practice Lab exercises Investigations: Sandstone abrasion Chem weathering & prtcl size Erosion & dep by wind & gravity	Labs	
Assessments: Formative: Unit 4 Homework Summative: Unit 4 Exam	Literacy Stds	Reading Standards R.1Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. R.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. And others as applicable.	¨Writing Standards W.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. W.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. W.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences	Video, ppt	Glaciers ppt Landscape Regions ppt Video: Glaciers – Ice on the Move
	Vocabulary	Tier 2: Abrasion Horizontal Structure Transport Region Elevation Undistorted Relief Valley	Tier 3: Glacier Striation Cirque Hanging valley Glacial till Glacial erratic Moraine Beach Longshore Transport Mountain Highland Plateau lowland	Web	
Time Frame: Nov-Dec (2 weeks)		Review:	Notes:	Misc	

Unit 5: Energy in Earth Processes Enduring Understandings: Analyze 3 methods of energy transfer Distiuish between heat & temperature Calculate heat gained/lost during temp & phase changes	Content Outcomes	Standards-Based Essential Skills	Strategies to Teach Skills & Concepts	Resources	
		Standard 1 (Math) Key Idea 1: Symbolic representation are used to communicate mathematically - calculate heat gained/lost during phase & temp changes Standard 4 Indicator 2.2b: Transfer of heat energy within atmosphere, hydrosphere, and Earth's surface by radiation, convection, and conduction.	Class Notes Reference Table Practice Homework practice Lab exercises Demos: Conduction, Convection, Radiation Reflection, Refraction, Absorption w/ laser, etc Investigations: Absorption of light by radiation	Labs	5-1 Black & Shiny 5-2 Soil & Water 5-3 Heat Transfer
Assessments: Formative: Unit 5 Homework	Literacy Stds	Reading Standards R.1Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. R.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. R.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. And others as applicable.	Writing Standards W.2 Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. W.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. W.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. W.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences. W.7 Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.	Video, ppt	
Summative: Unit 5 Exam	Vocabulary	Tier 2: 0	Tier 3: Absorption Reflection Scattering Wavelength Conduction Convection Radiation Energy Calorie Kinetic Energy Potential Energy Temperature Heat Specific Heat Latent Heat	Web	
Time Frame: February (2 Weeks)		Review:	Notes:	Misc	Balls to pass Light lab materials

<table>
<tr><td rowspan="2">Unit 6: Weather Variables

<u>Enduring Understandings:</u>
Explain & measure major weather variables
Understand connections between temp, humidity and air pressure
Interpret weather data graphs and correlate them w/ past,present,future weather changes
Explain causes of wind
Describe local & global wind patterns and the effects these have on weather/climate</td><td><u>Content Outcomes</u></td><td>Standard 2 (Information Systems)
Key Idea 1: Use technology to retrieve & process information

Standard 6 (Patterns of Change)
Key Idea 5: Identifying patterns of change to make predictions about future behavior

Standard 4
Indicator 2.1a: Earth has external source of energy
Indicator 2.1b: The transfer of heat energy within the atmosphere results in regions with density differences
Indicator 2.1c: Weather patterns become evident when weather variables are observed
Indicator 2.1d: Weather variables are measured using instruments
Indicator 2.1e: Weather variables are interrelated.
Indicator 2.1f: Temp, dewpoint, cloud formation, and precip are affected by expansion and contraction of air due to vertical movement
Indicator 2.1g: Weather variables can be represented radar and satellite images, weather maps, etc.</td><td>Class Notes
Reference Table Practice
Homework practice
Lab exercises

Demos:
Sling psychrometer

Investigations:
Graphing daily temp & pressure patterns</td><td><u>Labs</u></td><td>6-1 RH & Dew Point</td></tr>
<tr><td><u>Assessments:</u>
Formative:
Unit 6 Homework

Summative:
Unit 6 Exam</td><td><u>Literacy Stds</u></td><td><u>Reading Standards</u>
R.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.
R.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.
R.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. And others as applicable.</td><td><u>Writing Standards</u>
W.2 Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.
W.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
W.9 Draw evidence from literary or informational texts to support analysis, reflection, and research.
W.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences. W.7 Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.</td><td><u>Video, ppt</u></td><td>Current & trend weather station temp, Pressure, hmidity data
Cloud Images ppt</td></tr>
<tr><td></td><td><u>Vocabulary</u></td><td><u>Tier 2:</u>
Center
Region
Zone
Humidity
Cloud</td><td><u>Tier 3:</u>
Weather
Temperature
Air pressure
Relative Humidity
Dew point
Saturation
Coriolis effect
Condensation
Precipitation
HIGH pressure region
LOW pressure region
Convergence zone
Divergence zone</td><td><u>Web</u></td><td>UIUC Weather Data
Unisys Weather
Accuweather</td></tr>
<tr><td><u>Time Frame:</u>
March
(2-3 weeks)</td><td></td><td><u>Review:</u></td><td><u>Notes:</u></td><td><u>Misc</u></td><td>Scio Weather Station</td></tr>
</table>

Unit 7: Weather Systems Enduring Understandings: Identify atmosphere zones Distinguish air source regions and air masses they generate Deduce weather conditions,fronts,storm systems that form when different air masses meet Construct & analyze weather maps Forecast weather based on analyzed data	Content Outcomes	Standards-Based Essential Skills	Strategies to Teach Skills & Concepts	Resources	
		Standard 2 (Information Systems) Key Idea 1: Use technology to retrieve & process information Standard 4 Indicator 2.1h The concepts of density and heat energy in the atmosphere can explain the behavior of atmospheric moisture, temperature and pressure distributions, jet streams, wind, air masses, frontal boundaries, and the movement of cyclonic systems and otther storms.	Class Notes Reference Table Practice Homework practice Lab exercises Investigations:	Labs	7-1 Isotherms 7-2 Weather Maps
Assessments: Formative: Unit 7 Homework	Literacy Stds	Reading Standards R.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. R.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. R.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. And others as applicable.	Writing Standards W.2 Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. W.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. W.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. W.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences. W.7 Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.	Video, ppt	Video: Cyclone!
Summative: Unit 7 Exam	Vocabulary	Tier 2: Gradient Pressure Condensation Mass Region Mode	Tier 3: Troposphere Air pressure Pressure Gradient Dew Adiabatic cooling Air mass Source Region Warm front Cold front Station model Isobar Isotherm	Web	UIUC Weather Data Unisys Weather Accuweather
Time Frame: April (2-3 Weeks)		Review: Field Maps	Notes:	Misc	Scio Weather Station

Unit 8: Climate & the Water Cycle Enduring Understandings: Evaluate factors controlling water movement & storage in ground Identify factors directing surface drainange Apply principles of density and heat to explain long term effects of weather patterns (climate)	Content Outcomes	Standards-Based Essential Skills	Strategies to Teach Skills & Concepts	Resources	
		Standard 6 Key Idea 4: Equilibrium is a state of stability due to a balance between opposing forces (energy equilibrium) Standard 4 Indicator 2.1a: Earth has external source of energy Indicator 2.1b: Heat transfer in atmosphere results density diff's Indicator 2.1g: Weather variables can be represented radar and satellite images, weather maps, etc. Indicator 2.2a: Insolation heats Earth's surface and atmosphere unequally due to diff's in angle, duration, surface character Indicator 2.2c: Climate is influenced by latitude, nearness to large bodies of water & mtns, normal winds, etc Indicator 2.2d: Climate is affected by natural (e.g. el Niño, volcano) & human influences	Class Notes Reference Table Practice Homework practice Lab exercises Demo: Infiltration & Permeability	Labs	8-1 Permeability & Porosity 8-2 Settling Rates
Assessments: Formative: Unit 8 Homework	Literacy Stds	Reading Standards R.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. R.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. R.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. And others as applicable.	Writing Standards W.2 Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. W.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. W.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. W.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences. W.7 Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.	Video, ppt	Ptcle Sz vs Porosity ppt Video: Nova - Extreme Ice
		Tier 2:	Tier 3:		

Summative: Unit 8 Exam	Vocabulary	Marine Continental Evaporation Transpiration	Insolation Watershed Duration of Insolation Runoff Climate Water table Permeability Infiltration Global Warming Capillarity Marine Climate Continental Climate Evapotranspiration Discharge	Web	UIUC Weather Data Unisys Weather Accuweather
Time Frame: May (2-3 weeks)		Review:	Notes:	Misc	Scio Weather Station

Unit 9: Earth in Space Enduring Understandings: Describe apparent and real motions of planets & stars in the sky Describe the Helio & Geocentric models Identify causes & effects of changing sun path through sky throughout year	Content Outcomes	Standards-Based Essential Skills	Strategies to Teach Skills & Concepts	Resources	
		Standard 6 (Pattern of Change) Key Idea 5: Identifying patterns of change is necessary for making predictions - celestial movements, orbits, etc Standard 4 Indicator 1.1a: Most objects in solar system are in regular predictable motion Indicator 1.1b: Eight planets move around Sun in nearly circular orbits. Indicator 1.1c: Earth's latitude & longitude is based on Earth rotation & sun/star observations Indicator 1.1d: 1.1d Earth rotates on an imaginary axis at 15 degrees/hr Indicator 1.1e: Foucault pendulum and Coriolis effect provide evidence of E's rotation. Indicator 1.1f: E's changing position with regard to Sun and moon causes apparent celestial motions, seasons Indicator 1.1g: Seasonal changes in constellation provide evidence of E's revolution. Indicator 1.1h: Sun's apparent path varies with latitude and season. Indicator 1.1i: Gravitational pull of moon and Sun cause daily cycle	Class Notes Reference Table Practice Homework practice Lab exercises	Labs	9-1 Sun & Time 9-2 Solar transit
Assessments: Formative: Unit 9 Homework	Literacy Stds	Reading Standards R.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. R.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. R.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. And others as applicable.	Writing Standards W.2 Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. W.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. W.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. W.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences. W.7 Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.	Video, ppt	0
		Tier 2:	Tier 3:		

Summative: Unit 9 Exam	Vocabulary	Sphere Altitude Horizon Revolution Rotation Duration Vertical Apparent	Star trail Celestial sphere Zenith Duration of Insolation Solstice Equinox Vertical ray Apparent size Apparent solar day Apparent Magnitude	Web	
Time Frame: Jan-Feb (1.5 weeks)		Review:	Notes:	Misc	0

Unit 10: Beyond Earth Enduring Understandings: Explain Kepler's laws of planetary motion,gravity Construct orbits of different eccentricities Identify moon phases & causes Eplain origin & structure of universe Interpret H-R diagram	Content Outcomes	Standards-Based Essential Skills	Strategies to Teach Skills & Concepts	Resources	
		Standard 1 (Math) Key Idea 2: Ded & ind reasoning used to reach mathematical conclusions - gravity/orbit relationships Standard 6 (Pattern of Change) Key Idea 5: Identifying patterns of change is necessary for making predictions - celestial movements, orbits, etc Standard 4 Indicator 1.2a: Universe is vast and estimated to be over 10 billion yr old Indicator 1.2b: Stars form when gravity contracts clouds of molecules until nuclear fusion begins Indicator 1.2c: Solar system formed 5 billion yr ago from a giant cloud of gas and debris. Gravity caused planets to become layered. Indicator 1.2d: Asteroids, comets, and meteors are components of solar system. Indicator 1.2e: E's early atmosphere formed from outgassing of H2O vapor, CO2, N2, and bits of other gases from its interior. Indicator 1.2f: E's oceans formed from precip over millions of yrs.	Class Notes Reference Table Practice Homework practice Lab exercises Construct ellipses on board and paper, measure & calculate eccentricity	Labs	10-1 Elliptical Orbits 10-2 Retrograde Motion of Mars
Assessments: Formative: Unit 10 Homework	Literacy Stds	Reading Standards R.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. R.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. R.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. And others as applicable.	Writing Standards W.2 Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. W.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. W.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. W.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences. W.7 Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.	Video, ppt	Moon Phases Flash Tides Flash
		Tier 2:	Tier 3:		

Summative: Unit 10 Exam	Vocabulary	Terrestrial Revolution Rotation Apparent Major Spectrum Year	Terrestrial planets Apparent Magnitude Eclipse Ellipse Focus Major axis Eccentricity Gravity Luminosity Light-year Galaxy Redshift	Web	
Time Frame: Jan-Feb (1.5 weeks)		Review:	Notes:	Misc	0

Unit 11: Earth's Interior		Standards-Based Essential Skills	Strategies to Teach Skills & Concepts	Resources	
<u>Enduring Understandings:</u> Distinguish types of seismic waves Locate earthquake epicenter & origin time Describe composition and structure of earth's interior Identify evidence for P.T. Locate plate boundaries and distinguish types using equake data	<u>Content Outcomes</u>	Standard 4 Indicator 2.1a: Earth has external source of energy Indicator 2.1b: The transfer of heat energy within E's interior results in regions with density differences Indicator 2.1j: Properties of E's internal structure can be inferred from seismic waves Indicator 2.1k: Outward transfer of E's internal heat drives convection in mantle that moves the lithospheric plates Indicator 2.1l: Lithosphere consists of separate plates that ride on the more fluid asthenosphere creating convergent, divergent, and transform plate boundaries Indicator 2.1m: Many processes of rock cycle are consequences of plate dynamics, including magma, igneous rock formation, contact &regional metamorphism Indicator 2.1n: Mid-ocean ridges/rifts, trenches/subduction zones/island arcs, mountain ranges (folded, faulted, and volcanic), hot spots, and the magnetic and age patterns in surface bedrock are a consequence of forces of plate motion and Indicator 2.1o: Plate motions have resulted in global changes in geography, climate, and patterns of organic evolution. Indicator 2.1p: Landforms are the result of interaction of tectonic forces and processes of weathering, erosion, and deposition.	Class Notes Reference Table Practice Homework practice Lab exercises Investigation: Volcano distribution	<u>Labs</u>	11-1 Epicenters 11-2 Equakes & Subduction 11-3 Equakes & Volcano Distribution 11-4 Where in the World
<u>Assessments:</u> Formative: Unit 11 Homework	<u>Literacy Stds</u>	<u>Reading Standards</u> R.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. R.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. R.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. And others as applicable.	<u>Writing Standards</u> W.2 Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. W.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. W.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. W.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences. W.7 Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.	<u>Video, ppt</u>	Video: Volcano!

Summative: Unit 11 Exam	Vocabulary		Strata Fault Geosyncline Earthquake Seismograph Epicenter Focus Subsidence Isostacy Subduction Boundary Crust Mantle	Web	
Time Frame: December (1.5-2 weeks)		Review:	Notes:	Misc	Seismic Volcano Program

Unit 12: Geologic History Enduring Understandings: Correlate different rock strata Analyze Geologic past based on fossil evidence Calculate geologic age using radiometric dating	Content Outcomes	Standards-Based Essential Skills	Strategies to Teach Skills & Concepts	Resources	
		Standard 6 Key Idea 3: Grouping of magnitudes of time into a series of relative order provides a useful way to deal with immense range and the changes in scale - geologic time scale/geologic column Standard 4 Indicator 1.2h: Evolution of life caused dramatic changes in the composition of E's atmosphere - removal of CO2 & introduction of O2 Indicator 1.2i: Pattern of evolution of life-forms partially preserved in rock record. Indicator 1.2j: Geologic history can be reconstructed by observing sequences of rock types and fossils to correlate bedrock at various locations. Indicator 2.1o: Plate motions have resulted in global changes in geography, climate, and patterns of organic evolution.	Class Notes Reference Table Practice Homework practice Lab exercises Investigation: Correlation	Labs	12-1 Relative Dating
Assessments: Formative: Unit 12 Homework	Literacy Stds	Reading Standards R.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. R.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. R.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics. And others as applicable.	Writing Standards W.2 Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. W.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. W.9 Draw evidence from literary or informational texts to support analysis, reflection, and research. W.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences. W.7 Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.	Video, ppt	Correlation ppt Radioactive Decay ppt

Summative: Unit 11 Exam	Vocabulary	Relative Absolute Horizontal Superposition Index Intrusion Extrusion Uplift	Relative dating Uniformitarianism Original horizontality Principle of superposition Correlation Isotope Half-life Index fossil Geologic column Fault Subsidence	Web	
Time Frame: January (1.5-2 weeks)		Review:	Notes:	Misc	