

Course of Study for: Earth Science

Prepared October, 2007 by Tami Gaudette, Dave Ritrovato and Jeff Bower.

Prerequisites: Successful completion of Earth Science and Earth Science Laboratory

Scope:

Earth Science is a regent's course designed for students who found success in Biology. The course not only works on basic algebraic concepts in the abstract, it makes the concepts more concrete combining the hands on lab aspect. Key topics include Investigating Earth, Earths matter, Dynamic Earth, Earths changing surface, atmosphere and weather, oceans, space, and Earth history. Emphasis is placed Earth Science the Physical Setting.

Assessment:

Assessment comes in a variety of forms and wherever possible should be used to reflect and enhance the teaching and learning process that occurs in a classroom. Assessment should not be seen as a separate activity, but as an integral part of the teaching and learning process. Alternative assessments apply to any and all assessments that differ from multiple choice, timed, one-shot approaches that characterize most standardized and classroom assessment. Authentic assessments are assessments that engage students in applying knowledge and skills in the same way they are used in the real-world. Performance assessment is a broad term, encompassing many of the characteristics of both authentic and alternative assessments.

As this course of study demonstrates, it is clear that no single type of assessment could provide an accurate measurement of the learning experience. Students should have the best opportunity to demonstrate their understanding of the learning experience. Therefore, it is suggested that a variety of data gathering methods be used such as objective tests, observations, products, solving equations, written reports, performances and a collection of student works.

The **TIME** column offers a suggested time-line so that all topics listed in the **CONTENT/SKILLS** column are feasibly met. It is understood that times will need adjustments as the course develops. The **APPLICATION/PROJECT IDEAS** column offers suggestions and sources for the teacher. This column should be updated periodically to keep current and as new ideas are generated. The **KEY IDEA/PERFORMANCE INDICATOR** column coordinates topics with the NYS standards.

TIME	CONTENT/SKILLS	KEY IDEA/ PERFORM INDICATOR	APPLICATIONS/ PROJECT IDEAS
September	<p>INTRODUCTION</p> <p>Branches of Earth Science</p> <p>Graphing cyclic vs nonocyclic</p> <p>Observation vs inference</p> <p>Density</p> <p>Hurricanes</p> <p>The structure of the Earth</p>	<p>Safety and measurement</p> <p>Demo apple candle eaten</p> <p>Demo sink/ float, fluid layers</p> <p>Solving density probs., % error problems</p> <p>Hurricanes plotting paths</p> <p>A look at the shape and interior of Earth</p>	<p>Safety Lab</p> <p>Measurement Lab</p> <p>Density Lab</p> <p>Follow hurricane progress plotting them.</p>
Sept./Oct.	<p>MAPS</p> <p>Topographic Maps</p> <p>Longitude, Latitude</p> <p>Isolines, scales</p> <p>Profiles</p> <p>Map symbols</p> <p>NY state maps</p> <p>Coordinate systems</p> <p>World Maps</p>	<p>Use topographical maps to determine distances and elevations, safest and most efficient route for rescue purpose.</p> <p>Map isolines in the classroom of the room temperature.</p> <p>Determine the patterns of topography around the school</p> <p>Recognizing time zones</p>	<p>Mapping Mount Capulin Lab</p> <p>Local topographical map identification.</p> <p>Determine the slope of the hallway.</p> <p>Design a 3-d model from a contour map.</p>
October	<p>Time Zones</p>	<p>Discuss early warning system to protect society from natural disasters such as hurricanes</p>	<p>Construct and interpret a profile</p>
November	<p>ATMOSPHERE and WEATHER</p> <p>Structure and origin of the atmosphere</p> <p>Temperature changes moisture in the atmosphere</p> <p>Wind, land and sea breezes, corolis effect, jet stream, prevailing winds.</p> <p>Relative humidity and dew point readings (ESRT)</p> <p>Air masses and fronts</p> <p>Clouds</p> <p>Water cycle</p> <p>Temperature inversions</p> <p>Adiabatic lapse rate</p> <p>Orographic effect</p> <p>Global warming</p> <p>Acid rain pollution</p>	<p>Demo cloud in a bottle</p> <p>Sling psychrometers to determine the dew point and relative humidity.</p> <p>Intellicast.com watch and track storms</p> <p>Using the given data id the interface between the air masses.</p> <p>Predict the weather for the next few days</p> <p>Research extreme weather</p> <p>High low song</p> <p>Heat transfer demo</p>	<p>Absorbtion Radiation Lab</p> <p>Relative humidity and dew point lab- (outside lab)</p> <p>Natural disasters Lab</p> <p>Hawaiian Rainfall Patterns Lab</p>
Nov/Dec.	<p>Heat transfer</p> <p>Insolation</p> <p>Station models</p>	<p>Bike pump with pressure and temp probes in a sealed container</p>	

TIME	CONTENT/SKILLS	KEY IDEA/ PERFORM INDICATOR	APPLICATIONS/ PROJECT IDEAS
December	<p>CLIMATE and the WATER CYCLE</p> <p>Annual rainfall patterns Factors that affect climate Monsoons Wind belts, Storm Tracks Global winds Ocean currents Inland modification Latitude trends Specific heat Groundwater zones Movement of groundwater Rainfall and streamflow</p>	<p>Choose a foreign location make a travel brochure based on the climate</p> <p>Analyze Soil Core samples Analyze depositional erosional system of a stream Label parts of a stream. Id the maturity of a stream</p>	<p>Choose a place you have never gone to research the climate report it to the class.</p>
January	<p>WEATHERING AND EROSION</p> <p>Types, effects of weathering Wearing down and building up of the land. Permeability Porosity Capillary Soils types and formation and soil profiles Age stages of a stream Parts of a river and velocity Transport of soil Waves, wind, ice, gravity Soil as a resource Mass movement Factors that affect deposition NY and the ice age Coastal Processes Landscapes Drainage patterns</p>	<p>Predict the rate Alka-seltzer demo temp vs time Capillary action tube demo Sorting , unsorting Empty space challenge is it full? Schenectady landslide Avalanches!</p>	<p>Project mass wasting Porosity, Permeability and Capillary Lab Watersheds Rivers system Lab Erosional Depositional Lab. Glaciers Lab Alka Seltzer Lab weathering rate. NY State River Systems Lab</p> <p>Id tool use Oral Test Mineral Lab</p>

February	<p>MINERALS Matter and atoms Composition and structure Identify mineral characteristics Mineral groups</p>	<p>Construct atomic molecular models Mineral Id challenge Reading the ESRT Everyday uses</p>	<p>Rock Lab Oral Quiz Bring in a rock now id it the last week of school.</p>
Feb./March	<p>ROCKS Determine difference between rock – mineral Classification How rocks form Igneous Rocks Sedimentary Rocks Metamorphic Rocks Rock Cycle Economic uses natural resource and renewable</p>	<p>Bake a rock Rock id challenge Reading ESRT Features of each type</p>	<p>Paleomagnetism Activity Sea floor spreading</p>
March	<p>DYNAMIC CRUST PLATE TECTONICS Continental Drift Theory and development Plate boundaries Layers and structure of the earth Landform development Ring of fire Hotspots Passive vs active coast Paleomagnetism, seafloor spreading</p>	<p>Volcano project Mapping volcanos Mapping plates Mapping EQ (correlating all three) Mini lab plate boundaries label the plates Explore trenches vs highest mountains Folding vs faulting demo Plotting eq to id a plate boundary Seafloor spreading paper activity</p>	

TIME	CONTENT/SKILLS	KEY IDEA/ PERFORM INDICATOR	APPLICATIONS/ PROJECT IDEAS
April	<p>VOLCANOES 3 types and locations ring of fire magma vs formation felsic vs mafic eruptions Mt St Helens Eruption Ashfall patterns Climate change Hazards</p> <p>EARTHQUAKE How and where eq occur Measuring EQ 3 waves produced scales for measuring waves and damage Earthquake hazards Earth interior and layers Shadow zones ESRT chart of P and S wave</p>	<p>Ahs fall patterns across the country Observe Mt St Helens ash Volcano cam Imax documentary Hands on pumice, bombs and block, cinders. Volcano movie</p> <p>Plotting EQ Reading a seismogram p-s wave demo slinky travel time calculations rictor vs mercalli history Research recent eq's</p>	<p>Volcano lab Volcano Project</p> <p>EQ lab with internet application History of EQ in the US EQ safety</p>
April/May	<p>EARTH IN SPACE Motions of celestial objects Star paths Constellations Helio-geo-centric models Apparent motions of the sun Seasons Latitude and angle of the sun Daylight hours</p>	<p>Bright and dark line spectrum observing spectrum of the sun and gas tubes through a prism Graph the max and min sun cycles Solar system scale models Calculating the eccentricity Equal area law Foculant pendulum Phases from Earths point of view Use celestial sphere Find the north star and big dipper</p>	<p>Starlight lab Elliptical orbit lab Calculating Eccentricity</p>

<p>May</p>	<p>SPACE BEYOND EARTH Moon phases, eclipses, tides, orbis Astroids meteors and comets The sun, sunspots Galaxies Evolution of the universe Light energy EME analysis Visible light spectrum Doppler effect Solar system ESRT HR diagram p 15 ESRT Life cycles of stars Big bang theory Planets Elliptical orbits Keppler's laws</p> <p>EARTH HISTORY James Hutton Uniforitarianism Law of super position Original horizontality Igneous intrusion Cross cutting relationships Faults and folds Fossils Sequencing Correlating Geologic time scale Evolution of life Extinctions Radioactive dating</p>	<p>Planetarium visit Telescope night Diagram constellations</p> <p>M&M half life activity Geologic Time scale construction Index fossil Id ESRT center fold Cretacious analysys</p>	<p>Lab Rock Correlation</p>
------------	---	---	-----------------------------