Southern Cayuga Central School District – Curriculum Map

Subject: **Regents Earth Science** School Year: 2022 - 2023

Title or Topics w/ NYS Standards	Essential Questions & Vocabulary	Content Skills (Activities to cover Essential Questions)	Major Assessments (Tests, Project, etc.)	Time Frame
Process of Science and Scientific Basics Standards: Standard 1, Standard 2, Standard 6, Standard 7	1. What is science and how has it influenced the world? 2. Why do scientists address sources of error and what is their ultimate goal in regards to Sources of Error? 3. Why can it be said that Math is the universal language of science? Vocab: Quantitative, Qualitative, Sources of Error, Scientific Theory, Hypothesis, Direct Relationship, Indirect Relationship, Matter, Density, Mass, Volume, Force, Arbitrary, Independent Variable, Dependent Variable, Conclusion, Analysis	What is Science? Making Observations Sources of Error Introduction to Visual Representations of Data	Lab: Making Qualitative and Quantitative Observations Quiz: Test	2-3 weeks

2022-2023

Earth Science Overview: Standards:	**Essential Questions & Vocabulary**	**Content Skills (Activities to cover Essential Questions)**	**Major Assessments (Tests, Project, etc.)**	**Time Frame**
ST 1,2, 4 ST 1,4 ST 1,2,4, 7 ST 1,2,4,6, 7 ST 1,4,6, 7 ST 1,2,6, 4	1. What is Earth Science and what is studied? 2. Why is Earth Science important? 3. How can 4. information obtained from Earth Science affect humans? Vocab – Meteorology, Geology, Astronomy, Environment, Weather, Climate, Rock, Mineral, Cosmos, Universe, Planet, Satellite	Observations & Inferences - know differences Scientific Problem Solving - using equipment properly Scientific Measuring & Calculations - Mass, Weight, Length, Area, Volume, Time, Density Density - measure & calculate Graphing Skills - Direct/Inverse Relationships, Cyclic changes Proper use of the Earth Science Reference Tables	Lab: Measuring, Rounding and Errors Lab: Graphing – Hertzsprung Russel Diagram Lab: Graphing – Solar Cycles Lab: Graphing – Properties of planets Labs: Types of Graphs Quiz: Overview of ES and Graphing	1-2 weeks

Models and Dimensions of the Earth:	**Essential Questions & Vocabulary**	**Content Skills (Activities to cover Essential Questions)**	**Major Assessments (Tests, Project, etc.)**	**Time Frame**
ST 1,4,7 ST 1,2,4, 6 ST 1,2,4, 6 ST 1,2,4, 6 ST 1,2,4, 6	How do we represent and display information about the Earth? How do you Vocab – Latitude, Longitude, Oblate Spheroid, Altitude, Isoline Isotherm, Contour Line Topography, Contour Map, Elevation, Slope, Gradient	Eratosthenes Method for Circumference Latitude & Longitude Time Zones Field Maps, Isolines, Contour Lines Topographic Maps, Gradients, Profiles	Quiz: Overview of ES and Graphing Lab: Meteorology (Observing the atmosphere) Lab: Astronomy (Observing the moon and stars) Lab: Geology (Grouping Rocks)	1-2 weeks

Geology: Standards:	**Essential Questions & Vocabulary**	**Content Skills (Activities to cover Essential Questions)**	**Major Assessments (Tests, Project, etc.)**	**Time Frame**
Standard 4, PI 1.1, PI 1.2, PI 2.1, PI 2.2, PI 3.1 ST 1,2,4, 6 Performance Indicators: 3.1a-c	1. What is geology? 2. What are different maps and how are maps used. (longitude and latitude) 3. Introduction to Matter and phases of matter. 4. What are rocks and minerals, what are their categories, and how can they be differentiated? 5. What is geologic time and how can we measure the age of different 6. materials? 7. How can we determine the relative age of different geologic features? Vocab - Rock, Mineral, Phases of Matter, Radioactive decay,	Properties of Minerals Mineral Identification Tests Sedimentary Rocks - classification, origin, use of reference tables Metamorphic Rocks - classification, origin, use of reference tables Igneous Rocks - classification, origin, use of reference tables Use of rocks by humans Rock Cycle Earth's Resources Plate Tectonics Unit Patterns of Crustal Activity Earth's Lithospheric Plates Earthquakes & Volcanoes Theory of Plate Tectonics Evidence for Plate Tectonics Theory Earth's Layers Reading seismograms - Using Reference Tables to find epicenter distances, p- and s-wave travel times, origin times	Lab: Mapping the Room Lab Lab: Identifying rocks and Minerals Lab: Identifying relative age Lab: Tectonics Lab – evidence for Pangaea Test: Rocks and Minerals Quizzes: Rocks and Minerals + Identification of each Test: Geology Specifics Test Geologic Time Test: Geologic Features and Weathering/Erosion Quizzes: Weathering and Erosion	10-14 weeks

	relative age, absolute age, inclusion, Moh's hardness scale, Half-life, latitude, longitude, geologic time, period, epoch, era, fossil,	Mountain formation		

	tectonics, weathering, erosion, deposition, contour, cleavage, crystal, banding, igneous, metamorphic, sedimentary	Tectonic hot spots Sea-floor spreading Types of plate boundaries Geologic hazards Landscapes of New York State		

Earth Processes Standard 4 PI 1.2 PI 2.1	1. What are Earth Processes? 2. How can evidence left behind by Earth Processes be used to make determinations about the past and the future? 3. What is weathering and erosion – how are they similar and how are they different? 4. How does water velocity affect the size of particles being carried?	Weathering, Erosion, Deposition Mechanical vs Chemical How environment affects weathering and erosion Particle Size and water velocity Soil Mass movement Glaciers Plate Tectonics Volcanoes Earthquakes Groundwater - Factors affecting porosity, permeability, and capillarity - Aquifers, groundwater pollution, artesian wells Coastal Processes/Oceanography Beach erosion/depositional patterns Ocean currents as outlined on reference tables	Lab: Stream Table Lab: Graded bedding and particle size demonstrations Lab: Soil Layers Lab: Porosity and Water () Lab: Infiltration	3-5 weeks

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Meteorology: Standards:	**Essential Questions & Vocabulary**	**Content Skills (Activities to cover Essential Questions)**	**Major Assessments (Tests, Project, etc.)**	**Time Frame**
ES Standard 1: SI: KI 1, KI 3 Standard 4, PI 2.1, PI 2.2, Standard 4, PI 2.2	1. What is weather and climate? 2. What does the presence of different clouds mean for current and future weather? 3. How can we predict the weather with greatest degree of accuracy? Vocab – Weather, Climate, Pressure, Air Mass, Source Region, Cloud Types, Temperature, Humidity, Dew Point, Relative Humidity , Jet Stream, Atmosphere, attitude, elevation, rain shadow, hurricane, tornado, Coriolis Effect,	Methods of heat transfer (conduction, convection, radiation) and factors affecting their rates Dewpoint, humidity, cloud formation Measuring weather variables such as air pressure, temperature, dewpoint, wind speed, humidity, etc. Reading and drawing station models Weather patterns & synoptic weather maps Mapping weather variables (isolines, isotherms, isobars, etc.) Air mass and frontal boundaries (cold fronts, warm fronts, occluded fronts, stationary fronts, continental and maritime air masses, tropical, arctic, and polar air masses) Extreme weather (hurricanes, blizzards, tornadoes, sandstorms) Factors affecting climate (proximity to large bodies of water, mountain ranges, etc.)	Project: Weather observations + Predictions (2 labs) Lab: Coriolis Effect Lab: Density Lab: Specific Heat Lab: Relative Humidity Lab: Weather stations and predicting the future weather Test: Meteorology	4-6 weeks

2022-2023

Astronomy: Standards:	**Essential Questions & Vocabulary**	**Content Skills (Activities to cover Essential Questions)**	**Major Assessments (Tests, Project, etc.)**	**Time Frame**
Standard 1, 2, 6 Standard 4, PI 1.1 Standard 4, PI 1.2 a, b, c Standard 4, PI	1. What is astronomy? 2. Why is astronomy important for us on Earth and to Earth science? 3. Where do we fit in in the universe? 4. How do the cosmos affect the planet Earth? 5. What are stars and what is their life cycle? Vocab - Star, Protostar, Thermonuclear fusion, Nebula, Planetary Nebula, Supernova, Black hole, neutron star, gravity, orbit, revolution, rotation, axial tilt, ellipse, elliptical orbit, period, mass, weight, astronomical units	Celestial coordinate systems (altitude & azimuth) – Gravity & inertia Earth's rotation and its observable effects on apparent celestial motions of the stars, the Moon, the Sun, and planets) The Solar System and its components Kepler's 3 Laws of Planetary Motion Earth's revolution around the Sun and its effects Seasons of the year & their causes Memorize important astronomical calendar dates & data (summer & winter solstices, spring and fall equinoxes) Angle of Insolation and the Sun's path The Moon and its properties Phases of the Moon - Solar, lunar, and annular eclipses Earth's place in the Universe Models of the Universe - Evolution of the Universe (life cycles of stars, electromagnetic radiation, red-shift, doppler effect, blue-shift, bright-line spectra, the Big Bang Theory)	Lab: Orbits and Phet Lab Lab: Ellipses and Orbits Lab: Angle of Insolation Lab: Reasons for the Seasons Project: Solar System presentations Lab: Sunspot Analysis Lab: Dimensions of the Solar System Test: Astronomy	3-5 weeks

Factors in this curriculum, particularly names of labs & order of content, are subject to change.