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| **Suggested Time Frame** | **Standard** | **Essential Questions/****Learning Targets** | **Key Vocabulary** |
| **9 Weeks**(3 weeks) | **HYDROSPHERE**EEn.2.3.1--Explain how water is an energy agent (current and heat transfer).EEn.2.3.2—Explain how ground water and surface water interact.EEn.2.4.1—Evaluate human influences on freshwater availability.EEn.2.4.2—Evaluate human influences on water quality in North Carolina’s river basins, wetlands, and tidal environments. | The students will understand hydroelectric resources can be used to produce electricity in some areas of the country.* What is an advantage of using hydroelectric resources for power rather than using fossil fuel resources for power?
* What is a disadvantage of using hydroelectric resources for the production of electricity?
 | DensityCurrentsSpecific Heat CapacityWater (hydrologic)CycleThermocline Evaporation InfiltrationSalinityGyresUpwellingDensity current Surface currentSubsidenceEstuaryPermeabilityPorosityGroundwater Surface WaterPotable waterSalt-water intrusionNon-point sourcePoint sourceSedimentationWetlandsWatershedBasinsTributaryWellsFloodAquifersRunoffEutrophication |
| (2 weeks) | **METEOROLOGY**EEn.2.5.1—Summarize the structure and composition of our atmosphere.EEn.2.5.2--Explain the formation of typical air masses and the weather systems that result from air mass interactions.EEn.2.5.3—Explain how cyclonic storms form based on the interaction of air masses.EEn.2.5.4—Predict the weather using available weather maps and data (including surface, upper atmospheric winds, and satellite imagery).EEn.2.5.5—Explain how human activities affect air quality. | The students will understand a weather map shows closely spaced isobar lines over an area.* What do the isobar lines represent?
* What do the closely spaced isobars indicate about the weather in the area?

The students will understand a weather map shows many symbols to indicate various weather patterns.* What type of front does this symbol represent (cold front)?
* What kind of weather is expected at this front?

The students will understand that El Nino has an important influence and consequences on the weather and climate patterns on Earth.* What are the causes and effects of an El Nino?
 | Ozone Troposphere Stratosphere Mesosphere Thermosphere Exosphere Radiation Convection Air mass Coriolis effect Supercell Tornado  Fujita scale Tropical cyclone Saffir-Simpson scale Eye wall Storm surgeTrade winds Prevailing westerlies Polar easterliesJet stream FrontHigh pressure Low pressure Isobar Smog Acid precipitationChlorofluorocarbons (CFC’s) |
| (2 weeks) | EEn.2.6.1—Differentiate between weather and climate.EEn.2.6.2—Explain changes in global climate due to natural processes.EEn.2.6.3—Analyze the impacts that human activities have on global climate change (such as burning hydrocarbons, greenhouse effect, and deforestation).EEn.2.6.4—Attribute changes to Earth’s systems to global climate change (temperature change, changes in pH of ocean, sea level changes, etc.) | * What are the causes of recent changes in Atmospheric composition and how might they affect the climate in the future?
* What impacts have human had on the atmosphere and air quality?
* What are the consequences of climate change?
 | Carbon dioxideWeatherClimateGreenhouse gasesGreenhouse effectIce ageEl NinoGlobal warmingClimate change Heat islandDeforestationFossil fuels Carbon cyclepHAcidBase |
| (1 Week) | **ENVIRONMENTAL STUDIES**EEn.2.7.1— Explain how abiotic and biotic factors interact to create the various biomes in North Carolina.EEn.2.7.2—Explain why biodiversity is important to the biosphere.EEn.2.7.3—Explain how human activities impact the biosphere.EEn.2.8.1—Evaluation alternative energy technologies for use in North Carolina. | Students will understand farmers use of many conventional methods of growing crops.* What is one advantage of using conventional agricultural methods?
* How can conventional agricultural methods impact the economy?

The students will understand that our ecological footprints are important to the future of Earth.* Explain what an ecological footprint is.
* Why would countries such as the U.S. and Germany have a high ecological footprint?

Students will understand that to conserve natural resources, people are encouraged to “reduce, reuse, recycle.”* Identify one example of a material that could be reused.
* How could reusing the object provide a lasting impact on the environment?
 | BioticAbioticBiomeBiosphere Biodiversity HabitatPopulationSpeciesSustainableEcosystemInvasive species (non-native/exotic species) |
| (1 Week) | EEn.2.8.2—Critique conventional and sustainable aquaculture practices in terms of their environmental impacts.EEn.2.8.3—Explain the effects of uncontrolled population growth on the Earth’s resources.EEn.2.8.4—Evaluate the concept of “reduce, reuse, recycle” in terms of impact on natural resources. | * What makes a resource sustainable?
* Why is it important to conserve resources?
 | AquacultureSustainable AgricultureConventional AgricultureOverharvestingPopulationCarrying capacityRenewable resourcesRecycleAlternative energyTraditional energyLimiting factorsEcological footprintCarbon footprintCompost |
| (1 Week) | Review/ Benchmark |  |  |
| **9 Weeks**(2 Weeks) | **LITHOSPHERE**EEn.2.1.1—Explain how the rock cycle, plate tectonics, volcanoes, and earthquakes impact the lithosphere.EEn.2.1.2—Predict the locations of volcanoes, earthquakes, and faults based on information contained in a variety of maps.EEn.2.1.3—Explain how natural actions such as weathering, erosion (wind, water and gravity), and soil formation affect Earth’s surface.EEn.2.1.4—Explain the probability of an preparation for geohazards such as landslides, avalanches, earthquakes and volcanoes in a particular area based on available data. | Students will understand that volcanoes are a major geologic feature on Earth.* Describe the particles and gases emitted during a volcanic eruption.
* Describe how a volcano can impact global climate.
 | WeatheringErosion Foliation Bedding Sediment Deposition GeohazardFall zoneBarrier island TopographicSink holeConvectionPlate tectonicsRidge pushSlab pullConvergentDivergent TransformMagmaLavaLaharEpicenterFocus (Focal point)MagnitudePrimary WaveSecondary WaveSurface waveGeologic Time Scale |
| (1 Week) | EEn.2.2.1—Explain the consequences of human activities on the lithosphere (such as mining, deforestation, agriculture, overgrazing, urbanization, and land use) past and present.EEn.2.2.2—Compare the various methods humans use to acquire traditional energy sources (such as peat, coal, oil, natural gas, nuclear fission, and wood). | * How do human activities impact erosional processes and what are the possible consequences of this?
 | UrbanizationHarvestingMiningDeforestationReclamation MitigationAgricultureOvergrazing Land usePeatFossil fuelFissionFusionTraditional energy Alternative energy Natural Resource Jetty |
| (4 Weeks) | **ASTRONOMY**EEn.1.1.1—Explain the Earth’s motion through space, including precession, nutation, the barycenter, and its path about the galaxy.EEn.1.1.2—Explain how the Earth’s rotation and revolution about the Sun affect its shape and is related to seasons and tides.EEn.1.1.3—Explain how the sun produces energy which is transferred to the Earth by radiation.EEn.1.1.4—Explain how incoming solar energy makes life possible on Earth. | Students will understand that celestial objects in space have a gravitational pull on Earth.* Describe how the Moon influences the tides on Earth
* Why does the Moon have a stronger gravitational pull on Earth than the Sun?

Students will understand that radiation from the sun causes the land and water on Earth heat up at different rates.* Explain differential heating of the Earth’s surface (land temperature vs. water temperature)
* Predict how the heating of the surface would change if we received 100% of the Sun’s radiation.
 | UniverseGalaxyRotationRevolution Tilted axis SeasonsBarycenterSolstice Equinox Eclipse Elliptical Perigee ApogeeNeap tide Spring tide Nutation PrecessionSolarLunarKepler’s LawOrbitFissionFusionBig Bang Theory Gravitational pullPhotosynthesisElectromagnetic SpectrumSatellite |
| (1 Week) | **Review/ NC Final Exam** |  |  |