**Earth and Environmental Science Syllabus**

**Piedmont High School**

**Ms. Annette Harris**

The earth and environmental program at Piedmont High School is organized around and carefully aligned with the NC Standard Course of Study for Earth and Environmental Science. The table below shows the NC competencies along with the corresponding units of study in our earth and environmental science curriculum.

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| NC Essential Standards and Clarifying Objectives | Earth/Environmental Instructional Focus | Term**1st Six Weeks** |
| **Introduction, Scientific Method, Safety and Maps**Conduct and evaluate independent scientific investigations. | Unit 1 - Scientific Method, Scientific Inquiry and Laboratory SafetyUnit 2 – Locate Landforms Using Maps | Throughout the course |
| **Geology Unit** 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.2.1.4 Explain the probability of and preparation for geohazards such as landslides, avalanches, earthquakes and volcanoes in a particular area based on available data. | Unit 4 - Processes and Forces of the Lithosphere, Plate Tectonics, Volcanoes and Earthquakes  | 2weeks |
| **Rock Cycle, Weathering/Erosoin, Karst Topography** EEn.2.1.3 Explain how natural actions such as weathering, erosion (wind, water and gravity), and soil formation affect Earth’s surface.EEn2.3.2 Explain how ground water and surface water interact.EEn.2.2.1Explain the consequences of human activities on the lithosphere (such as mining, deforestation, agriculture, overgrazing, urbanization, and land use) past and present. | Unit 4 - The Rock Cycle and Soil Erosion and Deposition Unit 9 - Water ResourcesUnit 3 – Human Impact on the Lithosphere (Elements of this lesson overlap with the Environmental and Ecology Units) | 1 week |
| **Mining, Natural Resources, 3R’s Method of Conservation, Human Impact on the Biosphere and Lithosphere**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).EEn.2.8.4 Evaluate the concept of “reduce, reuse, recycle” in terms of impact on natural resources.EEn.2.8.2 Critique conventional and sustainable agriculture and 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.2.7.3 Explain how human activities impact the biosphere. | Unit 5 – Non-Renewable Energy Resources (overlaps with Energy Unit) | 1.5 weeks |
| **Hydrology Unit** **Oceans (Tides, Currents, wetlands)**EEn.2.6.4 Attribute changes in Earth systems to global climate change (temperature change, changes in pH of ocean, sea level changes, etc.).EEn.2.3.1 Explain how water is an energy agent (currents and heat transfer). 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. | Unit 8 – Oceans and Beaches | 1 week |
| **Freshwater, Groundwater, Surface Runoff, Human Impacts on Hydrology** EEn2.3.2 Explain how ground water and surface water interact.EEn.2.4.1 Evaluate human influences on freshwater availability.EEn.2.8.4 Evaluate the concept of “reduce, reuse, recycle” in terms of impact on natural resourcesEEn.2.4.2 Evaluate human influences on water quality in North Carolina’s river basins, wetlands and tidal environments. | Unit 9 – Water Resources and Water Quality and Water Pollution | 1 week |
| **Meteorology and Climate (5 weeks)** |  | **2nd Six Weeks** |
| **Structure and Composition of the Atmosphere** EEn.2.5.1 Summarize the structure and composition of our atmosphere.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. | Unit10 – The Atmosphere and Weather(Some elements of this unit overlap with Unit 14 - The Sun’s Energy) | 1 week |
| **Air Masses, Fronts, Storms: Hurricanes and Tornadoes, Station Models, Synoptic Weather Maps**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). | Unit 11 - Meteorology | 2 weeks |
| **Global Climate Changes, Air Quality, Human Impact on Climate**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.2.5.5 Explain how human activities affect air quality.EEn.2.7.3 Explain how human activities impact the biosphere.EEn.2.6.4 Attribute changes in Earth systems to global climate change (temperature change, changes in pH of ocean, sea level changes, etc.). | Unit 12– Air Pollution and Global Changes, and Climate | 2 weeks |
| **Environmental/Ecology Unit** |  | 3rd 6 weeks |
| **Alternative Energy Resources**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).EEn.2.8.1 Evaluate alternative energy technologies for use in North Carolina.  | Unit 6 – Renewable Energy Resources | 1 week |
| **Sustainability**EEn.2.8.4 Evaluate the concept of “reduce, reuse, recycle” in terms of impact on natural resources.EEn.2.8.2 Critique conventional and sustainable agriculture and aquaculture practices in terms of their environmental impacts.EEn.2.8.3 Explain the effects of uncontrolled population growth on the Earth’s resources. | Elements of Unit 3; Unit 4; Unit 5; Unit 6; and Unit 9 overlap into this lesson | 1 week |
| **Ecosystems, Biosphere, Human Impact on the Biosphere**EEn.2.7.1 Explain how abiotic and biotic factors interact to create the various biomes in North CarolinaEEn.2.7.2 Explain why biodiversity is important to the biosphere. | Elements of Unit 3; Unit 4; Unit 5; Unit 6; and Unit 9 overlap into this lesson | 3 weeks |
| **Astronomy Unit** |  | 2 weeks |
| **The Sun and Seasons**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. | Unit 14 – Sun’s Energy | 1 week |
| **Earth’s Motion**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. | Unit 13 – Planetary Motion | 1 week |

**Materials and supplies:**

* 1 9x11” spiral bound 100 page notebook ($.97 at Walmart—this notebook is a bit larger than others).
* One 12-pack of colored pencils, pencils, glue sticks
* Consider small pair of scissors, glue sticks, 12 inch ruler, needle compass for drawing circles
* Please, if possible, collect magazines with photos of the outdoors, animals, and ecological and environmental topics

**Methods:**

* To facilitate the organization necessary in teaching and learning this comprehensive curriculum, will need to complete class notes with interspersed summary prompts and review questions, supporting labs / activities / worksheets and problem-based assessments.
* New material is presented using PowerPoint presentations (to incorporate images and graphics) and an internet activities and assignments, improving student comprehension and engagement.
* Students are often required to work in collaborative student groups to analyze data and form conclusions.

**Evaluation:**

* Throughout the course, students are evaluated on their work based on both accuracy and completion.
* Multiple choice / true – false/ short answer tests have the greatest impact on a student’s class average.
* The Earth and Environmental Science summative exam is given upon completion of the course. The summative exam is a state-wide test.

**Contact information:**

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