



Correlations to the North Carolina Standard Course of Study *Grades 6,7,8* *PRO3001, PRO3002, PRO3003* *Physical Science, Life Science, Earth Science*

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6th Grade

North Carolina Science Standard	Corresponding Propello Unit(s)
<p>PS.6.1 Understand the structure, states, and physical properties of matter.</p> <p>PS.6.1.1 Use models to illustrate that matter is made of atoms and elements, and are distinguished from each other by the types of atoms that compose them.</p>	<p style="text-align: center;">Matter</p>
<p>PS.6.1 Understand the structure, states, and physical properties of matter.</p> <p>PS.6.1.2 Use models to explain the relationship between changes in thermal energy in a substance and the motion of its particles (including phase changes).</p>	<p style="text-align: center;">Matter and Energy Energy Transfer</p>
<p>PS.6.1 Understand the structure, states, and physical properties of matter.</p> <p>PS.6.1.3 Carry out investigations to compare the physical properties of pure substances that are independent of the amount of matter present including density, melting point, boiling point and solubility to properties that are dependent on the amount of matter present to include volume, mass and weight.</p>	<p style="text-align: center;">Matter</p>
<p>PS.6.2 Understand characteristics of thermal and electrical energy transfer and interactions of matter and energy.</p> <p>PS.6.2.1 Use models to compare the directional transfer of heat energy of matter through convection, radiation, and conduction.</p>	<p style="text-align: center;">Energy Transfer</p>
<p>PS.6.2 Understand characteristics of thermal and electrical energy transfer and interactions of matter and energy.</p> <p>PS.6.2.2 Use models to explain how the transfer of heat and resulting change of temperature impacts the behavior of matter to include expansion, and contraction.</p>	<p style="text-align: center;">Energy Transfer</p>
<p>PS.6.2 Understand characteristics of thermal and electrical energy transfer and interactions of matter and energy.</p> <p>PS.6.2.3 Carry out investigations to compare the transfer of thermal energy in insulated and non-insulated materials (examples could include insulated box, solar cooker, or styrofoam cup)</p>	<p style="text-align: center;">Energy Transfer</p>
<p>PS.6.2 Understand characteristics of thermal and electrical energy transfer and interactions of matter and energy.</p> <p>PS.6.2.4 Engage in argument from evidence to classify materials as conductors and insulators of energy (both thermal and electrical).</p>	<p style="text-align: center;">Energy Transfer</p>

<p>PS.6.2 Understand characteristics of thermal and electrical energy transfer and interactions of matter and energy.</p> <p>PS.6.2.5 Carry out investigations to explain the transfer of electrical energy in electrical circuits, to include how a circuit requires a complete loop through which an electrical current can pass.</p>	Energy Transfer
<p>PS.6.3 Understand the properties of waves and the wavelike property of energy in seismic, electromagnetic (including visible light), and sound waves.</p> <p>PS.6.3.1 Use models of a simple wave to explain wave properties in seismic, light, and sound waves that include: waves having a repeating pattern with a specific amplitude, frequency, and wavelength, and the amplitude of a wave is related to the energy of the wave.</p>	Waves
<p>PS.6.3 Understand the properties of waves and the wavelike property of energy in seismic, electromagnetic (including visible light), and sound waves.</p> <p>PS.6.3.2 Carry out investigations to conclude the relationship between the electromagnetic spectrum (including visible light) and sight.</p>	Waves
<p>LS.6.1 Understand the structures, processes, and behaviors of plants that enable them to survive and reproduce.</p> <p>LS.6.1.1 Use models to explain how the processes of photosynthesis, respiration, and transpiration work together to meet the needs of plants.</p>	Matter and Energy in Organisms
<p>LS.6.1 Understand the structures, processes, and behaviors of plants that enable them to survive and reproduce</p> <p>LS.6.1.2 Construct an explanation to compare how vascular and nonvascular plants obtain, transport, and use nutrients and water necessary for survival.</p>	Matter and Energy in Organisms
<p>LS.6.1 Understand the structures, processes, and behaviors of plants that enable them to survive and reproduce</p> <p>LS.6.1.3 Use models to summarize structural adaptations, processes, and responses that flowering plants use for defense, survival and reproduction.</p>	Matter and Energy in Organisms

<p>LS.6.2 Understand the flow of energy through ecosystems and the responses of populations to the biotic and abiotic factors in their environment.</p> <p>LS.6.2.1 Use models to summarize how energy derived from the sun is used by plants to produce sugars (photosynthesis) and is transferred to consumers and decomposers.</p>	Matter and Energy in Organisms
<p>LS.6.2 Understand the flow of energy through ecosystems and the responses of populations to the biotic and abiotic factors in their environment.</p> <p>LS.6.2.2 Analyze and interpret data to predict how the abiotic factors (such as temperature, water, sunlight, and soil quality) and biotic factors affect the ability of organisms to grow and survive in different biomes (freshwater, marine, temperate forest, rainforest, grassland, desert, taiga, tundra).</p>	Matter and Energy in Organisms
<p>ESS.6.1 Understand the earth/moon/sun system, and the properties, structures and predictable motions of celestial bodies in the Universe.</p> <p>ESS.6.1.1 Use models to explain how the relative motion and relative position of the Sun, Earth and moon affect the seasons, tides, phases of the moon, and eclipses.</p>	The Earth-Sun-Moon System
<p>ESS.6.1 Understand the earth/moon/sun system, and the properties, structures and predictable motions of celestial bodies in the Universe.</p> <p>ESS.6.1.2 Analyze and interpret data to compare the planets in our solar system in terms of: size and gravitational force relative to Earth, surface and atmospheric features, relative distance from the sun, and ability to support life.</p>	The Universe
<p>ESS.6.1 Understand the earth/moon/sun system, and the properties, structures and predictable motions of celestial bodies in the Universe.</p> <p>ESS.6.1.3 Use models to explain how the gravitational forces of the Sun and planets impact the structure of our solar system.</p>	The Universe
<p>ESS.6.1 Understand the earth/moon/sun system, and the properties, structures and predictable motions of celestial bodies in the Universe.</p> <p>ESS.6.1.4 Analyze and interpret data from historical and ongoing space exploration to illustrate the size and scale of the components of our solar system, galaxy, and universe.</p>	The Universe

<p>ESS.6.2 Understand the lithosphere and how interactions of constructive and destructive forces have resulted in changes in the surface of the earth over time.</p> <p>ESS.6.2.1 Use models to summarize the structure of the earth, including the layers, the mantle and core based on the relative position, composition and density.</p>	Earth's Changes
<p>ESS.6.2 Understand the lithosphere and how interactions of constructive and destructive forces have resulted in changes in the surface of the earth over time.</p> <p>ESS.6.2.2 Construct an explanation to illustrate how the movement of lithospheric plates can create geologic landforms and cause major geologic events such as earthquakes and volcanic eruptions.</p>	Earth's Changes
<p>ESS.6.2 Understand the lithosphere and how interactions of constructive and destructive forces have resulted in changes in the surface of the earth over time.</p> <p>ESS.6.2.3 Use models to explain the rock cycle and its relationship to the formation of soil (including how different types of soil come from different types of rocks).</p>	Earth's Changes
<p>ESS.6.3 Understand the reciprocal relationship between the lithosphere and humans.</p> <p>ESS.6.3.1 Engage in argument from evidence to explain that the good health of humans and the environment requires: monitoring of the lithosphere, maintaining soil quality and stewardship.</p>	Solving Environmental Problems
<p>ESS.6.3 Understand the reciprocal relationship between the lithosphere and humans.</p> <p>ESS.6.3.2 Obtain, evaluate, and communicate information to compare the implications of sustainable and unsustainable land use practices (including agriculture and deforestation) and the importance of stewardship.</p>	Solving Environmental Problems

7th Grade

North Carolina Science Standard	Corresponding Propello Content
<p>PS. 7.1 Understand motion, the effects of forces on motion, and the graphical representations of motion.</p> <p>PS.7.1.1 Construct an explanation to summarize the motion of an object by its position, direction of motion, and speed in respect to some other object.</p>	<p>Forces and Motion</p>
<p>PS.7.1 Understand motion, the effects of forces on motion, and the graphical representations of motion.</p> <p>PS.7.1.2 Use models to illustrate the effects of balanced and unbalanced forces acting on an object (including friction, gravity, and magnetism)</p>	<p>Forces and Motion</p>
<p>PS.7.1 Understand motion, the effects of forces on motion, and the graphical representations of motion.</p> <p>PS.7.1.3 Analyze and interpret graphical data to summarize the motion of an object to show a change in position over a period of time.</p>	<p>Forces and Motion</p>
<p>PS.7.1 Understand motion, the effects of forces on motion, and the graphical representations of motion.</p> <p>PS.7.1.4 Analyze and interpret graphical data to summarize the motion of an object to show a change in distance over a period of time for constant speed and variable motion.</p>	<p>Forces and Motion</p>
<p>PS.7.2 Understand forms of energy, energy transfer and transformation, and conservation in mechanical systems.</p> <p>PS.7.2.1 Construct an explanation to summarize how kinetic and potential energy contribute to the mechanical energy of an object</p>	<p>Energy</p>
<p>PS.7.2 Understand forms of energy, energy transfer and transformation, and conservation in mechanical systems.</p> <p>PS.7.2.2 Engage in argument from evidence to explain how energy can be transformed from one form to another, specifically potential energy and kinetic energy (models could include roller coasters, pendulums, or cars on ramps as examples).</p>	<p>Energy</p>
<p>PS.7.2 Understand forms of energy, energy transfer and transformation, and conservation in mechanical systems.</p> <p>PS.7.2.3 Carry out investigations to conclude that energy can be transferred from one system to another when two objects push or pull on each other over a distance (work) in a mechanical system using qualitative data.</p>	<p>Energy</p>

<p>PS.7.2 Understand forms of energy, energy transfer and transformation, and conservation in mechanical systems.</p> <p>PS.7.2.4 Carry out investigations to compare the efficiency of simple machines in relation to their advantages for particular purposes (to include inclined planes, pulleys, levers and wheel and axles) using qualitative data.</p>	Energy
<p>LS.7.1 Understand the processes, structures and functions of living organisms that enable them to survive, reproduce and carry out the basic functions of life.</p> <p>LS.7.1.1 Construct an explanation to conclude how the structures of single-celled organisms carry out all of the basic functions of life including: Euglena, Amoeba, Paramecium, Volvox.</p>	Cells
<p>LS.7.1 Understand the processes, structures and functions of living organisms that enable them to survive, reproduce and carry out the basic functions of life.</p> <p>LS.7.1.2 Use models to explain how the relevant structures within cells (including cell membrane, cell wall, nucleus, mitochondria, chloroplasts, and vacuoles) function to support the life of plant, animal, and bacterial cells.</p>	Cells
<p>LS.7.1 Understand the processes, structures and functions of living organisms that enable them to survive, reproduce and carry out the basic functions of life.</p> <p>LS.7.1.3 Use models to explain how the hierarchical organization of multicellular organisms from cells to tissues to organs to systems to organisms functions to support life.</p>	From Cells to Systems
<p>LS.7.1 Understand the processes, structures and functions of living organisms that enable them to survive, reproduce and carry out the basic functions of life.</p> <p>LS.7.1.4 Construct an explanation to summarize how the major systems of the human body interact with each other to support life (including digestion, respiration, reproduction, circulation, excretion, nervous).</p>	From Cells to Systems
<p>LS.7.2 Understand the relationship of the mechanisms of reproduction, patterns of inheritance, and potential variation among offspring.</p> <p>LS.7.2.1 Construct an explanation supported with scientific evidence to summarize the role of genes on chromosomes as inherited cellular structures which contribute to an organism's traits (not to include the structure of DNA)</p>	Inheritance and Variation

<p>LS.7.2 Understand the relationship of the mechanisms of reproduction, patterns of inheritance, and potential variation among offspring.</p> <p>LS.7.2.2 Use models to explain how asexual reproduction results in offspring with identical genetic information while sexual reproduction results in offspring with genetic variation (not to include specific phases of mitosis and meiosis).</p>	<p>Inheritance and Variation Reproduction</p>
<p>LS.7.2 Understand the relationship of the mechanisms of reproduction, patterns of inheritance, and potential variation among offspring.</p> <p>LS.7.2.3 Use models (Punnett squares) to infer and predict patterns of the inheritance of single genetic traits from parent to offspring (including dominant and recessive traits).</p>	<p>Inheritance and Variation</p>
<p>ESS.7.1 Understand the atmosphere and how the cycling of water relates to Earth's weather and climate.</p> <p>ESS.7.1.1 Analyze and interpret data to compare the composition, properties and structure of Earth's atmosphere to include: mixtures of gases and differences in temperature and pressure within layers.</p>	<p>Weather</p>
<p>ESS.7.1 Understand the atmosphere and how the cycling of water relates to Earth's weather and climate.</p> <p>ESS.7.1.2 Use models to explain how the energy of the Sun and Earth's gravity drive the cycling of water, including changes of state, as it moves through multiple pathways in Earth's systems and relates to weather patterns on Earth.</p>	<p>The Water Cycle</p>
<p>ESS.7.1 Understand the atmosphere and how the cycling of water relates to Earth's weather and climate.</p> <p>ESS.7.1.3 Analyze and interpret data to explain the relationship between the movement of air masses, high and low pressure systems, frontal boundaries and weather conditions that may result.</p>	<p>Weather</p>
<p>ESS.7.1 Understand the atmosphere and how the cycling of water relates to Earth's weather and climate.</p> <p>ESS.7.1.4 Use models to predict weather conditions based on observations (including clouds, air masses, fronts), measurements (wind speed and direction, air temperature, humidity and air pressure), weather maps, satellites and radar.</p>	<p>Weather</p>

<p>ESS.7.1 Understand the atmosphere and how the cycling of water relates to Earth's weather and climate.</p> <p>ESS.7.1.5 Use models to explain the influence of convection, global winds, and the jet stream on weather and climatic conditions.</p>	Climate
<p>ESS.7.2 Understand the reciprocal relationship between the atmosphere and humans.</p> <p>ESS.7.2.1 Engage in argument from evidence to explain that the good health of humans and environment requires: monitoring of the atmosphere, maintaining air quality and stewardship</p>	Climate
<p>ESS.7.2 Understand the reciprocal relationship between the atmosphere and humans.</p> <p>ESS.7.2.2 Analyze and interpret data to explain how changes in the structure and composition of the atmosphere affects the greenhouse effect and global temperatures.</p>	Climate
<p>ESS.7.2 Understand the reciprocal relationship between the atmosphere and humans.</p> <p>ESS.7.2.3 Obtain, evaluate, and communicate information to explain the impacts on humans and mitigation strategies of potentially hazardous environmental factors (including air quality index, UV index, Heat Index, Wildfires) and storms (hurricanes, blizzards, tornadoes, severe thunderstorms, floods).</p>	Natural Hazards

8th Grade

North Carolina Science Standard	Corresponding Propello Content
<p>PS.8.1 Understand the properties of matter and changes that occur when matter interacts in open and closed systems.</p> <p>PS.8.1.1 Construct an explanation to classify matter as elements, compounds, or mixtures based on how the atoms are arranged in various substances.</p>	Physical and Chemical Changes
<p>PS.8.1 Understand the properties of matter and changes that occur when matter interacts in open and closed systems.</p> <p>PS.8.1.2 Use models to illustrate the structure of atoms in terms of the protons, electrons, and neutrons (using the location, charges and comparative size of these subatomic particles), without consideration of isotopes, ions, and energy levels.</p>	Physical and Chemical Changes
<p>PS.8.1 Understand the properties of matter and changes that occur when matter interacts in open and closed systems.</p> <p>PS.8.1.3 Analyze and interpret data to explain how the physical properties of elements and their reactivity have been used to produce the current model of the Periodic Table of Elements</p>	Physical and Chemical Changes
<p>PS.8.1 Understand the properties of matter and changes that occur when matter interacts in open and closed systems.</p> <p>PS.8.1.4 Construct an explanation to classify changes in matter as physical changes (including changes in size, shape, and state) or chemical changes that are the result of a chemical reaction (including changes in energy, color, formation of a gas or precipitate)</p>	Physical and Chemical Changes
<p>PS.8.1 Understand the properties of matter and changes that occur when matter interacts in open and closed systems.</p> <p>PS.8.1.5 Use models to illustrate how atoms are rearranged during a chemical reaction so that balanced chemical equations support the Law of Conservation of Mass (in both open and closed systems).</p>	Chemical Reactions
<p>LS.8.1 Understand the hazards caused by agents of diseases that affect living organisms.</p> <p>LS.8.1.1 Construct an explanation to compare the basic characteristics of viruses, bacteria, fungi and parasites relating to the spread, treatment and prevention of disease.</p>	Disease Agents

<p>LS.8.1 Understand the hazards caused by agents of diseases that affect living organisms.</p> <p>LS.8.1.2 Analyze and interpret data to explain the difference between epidemic and pandemic as it relates to the spread, treatment and prevention of disease</p>	Disease Agents
<p>LS.8.2 Understand how organisms interact with and respond to the biotic and abiotic factors in their environment.</p> <p>LS.8.2.1 Carry out investigations to explain how changing biotic and abiotic factors such as food, water, shelter, and space affect populations in an ecosystem.</p>	Matter and Energy in Ecosystems
<p>LS.8.2 Understand how organisms interact with and respond to the biotic and abiotic factors in their environment.</p> <p>LS.8.2.2 Construct an explanation to summarize the relationships among producers, consumers, and decomposers including the positive and negative consequences of such interactions including: coexistence and cooperation, competition (predator/prey), parasitism, and mutualism</p>	Matter and Energy in Ecosystems
<p>LS.8.2 Understand how organisms interact with and respond to the biotic and abiotic factors in their environment.</p> <p>LS.8.2.3 Construct an explanation to summarize how food provides the energy and the building materials required for the growth and survival of all organisms (to include plants)</p>	Matter and Energy in Ecosystems
<p>LS.8.2 Understand how organisms interact with and respond to the biotic and abiotic factors in their environment.</p> <p>LS.8.2.4 Use models to explain how the flow of energy within food webs is interconnected with the cycling of matter (water and carbon).</p>	Matter and Energy in Ecosystems
<p>LS.8.3 Understand the evolution of organisms over time based on evidence and processes.</p> <p>LS.8.3.1 Analyze and interpret data to infer evolutionary relationships by using evidence drawn from fossils and comparative anatomy.</p>	Evidence of Evolution
<p>LS.8.3 Understand the evolution of organisms over time based on evidence and processes.</p> <p>LS.8.3.2 Use models to explain the process of natural selection, in which genetic variations in a population affect individuals' likelihood of surviving and reproducing in its environment.</p>	Mechanics of Evolution

<p>ESS.8.1 Understand the history of Earth and its life forms based on evidence of change</p> <p>ESS.8.1.1 Analyze and interpret data to conclude the relative age of Earth and relative age of rocks and fossils from index fossils and ordering of rock layers.</p>	<p>Earth's History</p>
<p>ESS.8.1 Understand the history of Earth and its life forms based on evidence of change</p> <p>ESS.8.1.2 Engage in argument from evidence to explain the use of fossils, composition of sedimentary rocks, faults, and igneous rock formations found in rock layers as evidence of the history of the Earth and its life forms.</p>	<p>Earth's History</p>
<p>ESS.8.2 Understand the hydrosphere including freshwater, estuarine, ocean systems.</p> <p>ESS.8.2.1 Use models to explain the structure of the hydrosphere including: water distribution on earth, local river basins, estuaries, and water availability.</p>	<p>The Hydrosphere Ecosystem Dynamics</p>
<p>ESS.8.2 Understand the hydrosphere including freshwater, estuarine, ocean systems.</p> <p>ESS.8.2.2 Use models to explain how temperature and salinity drive major ocean currents and how these currents impact climate, ecosystems, and the distribution of nutrients, minerals, dissolved gases, and life forms.</p>	<p>The Hydrosphere Ecosystem Dynamics</p>
<p>ESS.8.3 Understand the reciprocal relationship between the hydrosphere and humans.</p> <p>ESS.8.3.1 Analyze and interpret data to predict the safety and potability of water supplies in North Carolina based on physical and biological factors, including: temperature, dissolved oxygen, pH, nitrates and phosphates, turbidity, and bio-indicators.</p>	<p>The Hydrosphere Ecosystem Dynamics</p>
<p>ESS.8.3 Understand the reciprocal relationship between the hydrosphere and humans.</p> <p>ESS.8.3.2 Engage in argument from evidence to explain that the good health of humans and the environment requires: monitoring of the hydrosphere, water quality standards, methods of water treatment, maintaining safe water quality, and stewardship.</p>	<p>The Hydrosphere Ecosystem Dynamics</p>

<p>ESS.8.4 Understand the environmental implications associated with the various methods of obtaining, managing, and using energy resources.</p> <p>ESS.8.4.1 Construct an explanation to classify the primary sources of energy as either renewable (Geothermal, Biomass, Solar, Wind, Hydroelectric) or nonrenewable (Coal, Petroleum, Natural Gas, Nuclear).</p>	Human Impacts on Earth's Systems
<p>ESS.8.4 Understand the environmental implications associated with the various methods of obtaining, managing, and using energy resources.</p> <p>ESS.8.4.2 Engage in argument from evidence to explain the environmental consequences of the various methods of obtaining, transforming, and distributing energy.</p>	Human Impacts on Earth's Systems
<p>ESS.8.4 Understand the environmental implications associated with the various methods of obtaining, managing, and using energy resources.</p> <p>ESS.8.4.3 Analyze and interpret data to illustrate the relationship between human activities and global temperatures since industrialization.</p>	Human Impacts on Earth's Systems
<p>ESS.8.4 Understand the environmental implications associated with the various methods of obtaining, managing, and using energy resources.</p> <p>ESS.8.4.4 Obtain, evaluate, and communicate information to compare the long term implications of the use of renewable and nonrenewable energy resources and the importance of stewardship and conservation</p>	Human Impacts on Earth's Systems