Randolph County School System 6-8 Curriculum Pacing

1st Quarter Check-in 1: Physical Science	2nd Quarter Check-in 2: Earth Science	3rd Quarter Check-in 3: Life Science	4th Quarter
Intro/Getting to know students/Scientific Method/Lab Safety (1 Week) **8.P.1 Chemistry (8 Weeks)** (8.P.1.1, 8.P.1.2, 8.P.1.3, and 8.P.1.4)	**8.P.2 Energy Resources (1 Week)** (8.P.2.1 and 8.P.2.2) **8.E.1 Hydrosphere (6 Weeks)** (8.E.1.1, 8.E.1.2, 8.E.1.3, and 8.E.1.4) **8.E.2 Geologic Time/Fossils (first 2 of 4 Weeks)** (8.E.2.1 and 8.E.2.2)	**8.E.2 Geologic Time/Fossils (last 2 of 4 Weeks)** (8.E.2.1 and 8.E.2.2) **8.L.4 History of Earth/Change Over Time (3 Weeks)** (8.L.4.1 and 8.L.4.2) **8.L.1 Microbiology (2 Weeks)** (8.L.1.1 and 8.L.1.2) **8.L.3 Ecology/Populations (first 2 of 3 Weeks)** (8.L.3.1, 8.L.3.2, and 8.L.3.3)	**8.L.3 Ecology/Populations (last 1 of 3 Weeks)** (8.L.3.1, 8.L.3.2, and 8.L.3.3) **8.L.5 Molecular Biology (2 Weeks)** (8.L.5.1 and 8.L.5.2) **8.L.2 Biotechnology (1 Week)** (8.L.2.1) ***Review and Testing (Last 5 Weeks)***

Updated 9/21/2021

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New Standards to be Taught (1 Week – 1st Nine Weeks)

- Scientific Method / Lab Safety Review

Learning Targets/Essential Questions:

- I can form a hypothesis based on prior knowledge of a subject.
- I can apply the scientific method when conducting an experiment.
- I can construct bar and line graphs to represent data.
- I can analyze data collected from an experiment to make conclusions.
- I can identify the independent, dependent, and controlled variables in an experiment.
- I can demonstrate lab safety skills during an experiment.

Key Vocabulary

- Scientific method
- Hypothesis
- Observation
- Inference
- Problem
- Experiment
- Materials
- Data
- Independent variable
- Dependent variable
- Constant
- Control
- Analysis
- Conclusion
- Lab Safety

Key Concepts and Skills

- Scientific method
- Measurement
- Lab tools
- Lab Safety
- Science skills
- Graphing (bar and line graphs)

Resources

- See Randolph County Schools website for resource list

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New Standards to be Taught (1st Nine Weeks)

8.P.1: Understand the properties of matter and changes that occur when matter interacts in an open and closed container. (8 Weeks)

- 8.P.1.1: Classify matter as elements, compounds, or mixtures based on how the atoms are packed together in arrangements
- 8.P.1.2: Explain how the physical properties of elements and their reactivity have been used to produce the current model of the Periodic Table of Elements
- 8.P.1.3: Compare physical changes such as size, shape, and state to chemical changes that are the result of a chemical reaction to include changes in temperature, color, formation of a gas or precipitate
- 8.P.1.4: Explain how the idea of atoms and balanced chemical equations support the law of conservation of mass

Learning Targets/Essential Questions:

- I can explain the importance of atoms.
- I can describe the structure of an atom.
- I can list the three basic particles in the atom.
- I can create a model of an atom.
- I can describe the parts of an atom.
- I can compare and contrast protons, neutrons, and electrons.
- I can explain the relationship between atoms, elements, compounds, and mixtures.
- I can model how atoms combine to make compounds.
- I can differentiate between a homogeneous and heterogeneous mixture.
- I can discuss how I come into contact with elements every day.
- I can identify chemical/physical properties and changes.
- I can describe the arrangement and movement of atoms in solids, liquids, and gases.
- I can identify the three states of matter and organize substances based on these properties.
- I can explain the relationship between phase and density.
- I can define density.
- I can calculate the density of an object.
- I can explain how Mendeleev contributed to the periodic table.
- I can identify groups and periods on the periodic table.
- I can use the periodic table to identify characteristics of elements.
- I can differentiate between metals, nonmetals, and metalloids and classify elements based on this differentiation.
- I can use the periodic table to find out the number of electrons, protons, and neutrons in an element's atom.
- I can use the periodic table to determine the number of valence electrons an element has.
- I can identify groups of elements and described how they are classified based on similar properties.

- I can name the chemical symbol of an element.
- I can recognize elements within a chemical formula of a compound.
- I can identify evidence that chemical change has occurred.
- I can identify chemical formulas for common compounds.
- I can explain how mixtures and compounds are separated.
- I can recognize physical and chemical properties in order to identify substances.
- I can differentiate between physical and chemical properties.
- I can differentiate between physical and chemical changes.
- I can identify ways to change the rate of a chemical reaction.
- I can explain why water is known as the universal solvent.
- I can distinguish between acids and bases using the pH scale.
- I can identify the reactants and products in a chemical equation.
- I can demonstrate the law of conservation of mass through balancing chemical equations.
- I can explain the law of conservation of matter.

Key Vocabulary

8.P.1.1	***8.P.1.2***	***8.P.1.3***	***8.P.1.4***
• Atom • Proton • Electron • Neutron • Element • Compound • Mixture • Homogenous Mixture • Heterogeneous Mixture • Molecule • Pure substance • Density • Solid • Liquid • Gas	• Periodic table • Chemical symbol • Atomic number • Atomic mass • Dmitri Mendeleev • Group • Period • Valence electron • Metals • Nonmetals • Metalloids • Chemical formula • Ductile • Malleable • Insulator • Conductor	• Matter • Physical property • Chemical property • Density • Solubility • Melting point • Boiling point • Acidity • Basicity • Combustibility • Reactivity • States of matter • Chemical change • Physical change • Precipitate • Catalyst • pH Scale	• Law of Conservation of Mass • Chemical reaction • Chemical equation • Coefficient • Subscript • Reactant • Product • Yield

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Key Concepts and Skills	Resources
● Physical properties ● Physical change ● Chemical properties ● Chemical change ● Atoms ● Element ● Compound ● Types of mixtures ● Periodic Table of the Elements ● Law of Conservation of Mass ● Chemical equations ● Chemical reactions ***10 COMMON SUBSTANCES students should recognize:*** water (H_2O), carbon dioxide (CO_2), sucrose ($C_{12}H_{22}O_{11}$), oxygen (O_2), table salt (NaCl), household bleach (NaClO), hydrochloric acid (HCl), ammonia (NH_3), baking soda ($NaHCO_3$), vinegar ($HC_2H_3O_2$, 5% Solution)	● See Randolph County Schools website for resource list

New Standards to be Taught (2nd Nine Weeks)

8.P.2: Explain the environmental implications associated with the various methods of obtaining, managing, and using energy. (1 Week)

- 8.P.2.1: Explain the environmental consequences of the various methods of obtaining, transforming and distributing energy
- 8.P.2.2: Explain the implications of the depletion of renewable and nonrenewable energy resources and the importance of conservation

Learning Targets/Essential Questions:

- I can identify the many forms of energy that we can use in our daily lives.
- I can compare and contrast the different kinds of energy sources and the effects on the environment.
- I can identify ways to use energy from the sun.
- I can discuss the implications of the depletion of renewable and non-renewable resources.
- I can list ways to conserve energy.

- I can give examples of the environmental impacts of using fossil fuels in the future.
- I can justify the importance of the terms reduce, reuse, and recycle.
- I can recognize the effect of population growth on the need for natural resources.

Key Vocabulary

8.P.2.1	***8.P.2.2***
• Energy • Solar energy • Natural resources • Renewable resource • Nonrenewable resource	• Energy conservation • Conservation

Key Concepts and Skills	Resources
• Energy usage • Depletion of resources • Renewable resources • Nonrenewable resources • Fossil Fuel	• See Randolph County Schools website for resource list

New Standards to be Taught (2nd Nine Weeks)

8.E.1: Understand the hydrosphere and the impact of humans on local systems and the effects of the hydrosphere on humans. (6 Weeks)

- 8.E.1.1: Explain the structure of the hydrosphere including
  - Water distribution on earth
  - Local river basins and water availability
- 8.E.1.2: Summarize evidence that Earth's oceans are a reservoir of nutrients, minerals, dissolved gases, and life forms:
  - Estuaries
  - Marine Ecosystems
  - Upwelling

    - Behavior of gases in the marine environment
    - Value and sustainability of marine resources
    - Deep ocean technology and understandings gained
- 8.E.1.3: Predict the safety and portability of water supplies in North Carolina based on physical and biological factors, including
    - Temperature
    - Dissolved Oxygen
    - pH
    - Nitrates and phosphates
    - Turbidity
    - Bio-indicators
- 8.E.1.4: Conclude that the good health of humans requires:
    - Monitoring of the hydrosphere
    - Water quality standards
    - Methods of water treatment
    - Maintaining safe water quality
    - Stewardship

Learning Targets/Essential Questions:

- I can recognize and explain water's unique properties.
- I can recognize the distribution of water on earth and organize it based on its location and percentage of total water.
- I can summarize why the ocean is salty.
- I can justify reasons for ocean salinity to increase or decrease.
- I can summarize why the ocean is an integral component of the world's climate.
- I can illustrate and explain the stages of the water cycle.
- I can justify that everyone lives in a river basin.
- I can model examples of why water is referred to as the universal solvent.
- I can name examples of water in the three main states of matter.
- I can identify and explain the unique characteristics of estuaries.
- I can explain how an estuary acts as an environmental filter.
- I can explain the importance of estuaries as a marine ecosystem.
- I can illustrate how upwelling occurs in the oceans.
- I can demonstrate understanding of an ocean food web.

- I can differentiate between different types of natural resources provided by the oceans.
- I can explain the effects of winds on the ocean.
- I can discuss why carbon dioxide is one of the most important gases that dissolves in the ocean.
- I can compare and contrast cold seeps and hydrothermal vents.
- I can interpret the physical, chemical, and biological measurements collected from the hydrosphere that indicates poor water quality.
- I can explain how the temperature of water can affect the organisms that can survive there.
- I can discuss the importance of dissolved water on water quality.
- I can explain how turbidity, pH, and temperature relate to water quality.
- I can identify bio-indicators and explain how they relate to water quality.
- I can argue how excess nitrates and phosphates can affect water quality.
- I can recognize harmful contaminants and determine where they originate.
- I can illustrate how human activities can lead to pollution.
- I can propose solutions to pollution.
- I can give examples of water conservation.
- I can illustrate how salt water can be converted to usable fresh water.
- I can argue that water is essential to life.

Key Vocabulary

8.E.1.1	***8.E.1.2***	***8.E.1.3***	***8.E.1.4***
• Hydrosphere • Polarity • Cohesion • Adhesion • Surface tension • Density • Specific Heat • Universal Solvent • Universal Solvent • Hydrothermal vents • Runoff • Infiltration • Permeability • River basin	• Estuaries • Reservoir • Brackish water • Marine ecosystem • Ocean • Ocean zones • Ocean food web • Abyss • Extremophiles • Upwelling • Deep ocean technology • Cold seeps	• Indicator • Water quality indicator • pH • Nitrates • Phosphates • Turbidity • Bio-indicators • Macro-invertebrates • Temperature • Dissolved Oxygen (DO) • Sewage	• Potable water • Pollution • Point source pollution • Non-point source pollution • Contaminants • Water quality • Coagulation • Sedimentation • Stewardship • Water treatment

• Watershed • Saltwater • Freshwater • Salinity • Glacier • Ice caps • Surface water • Groundwater • Aquifer			
Key Concepts and Skills • The water cycle (review) • Properties of water • Water distribution on earth • Marine ecosystems • Water quality • Human Impact on water		Resources • See Randolph County Schools website for resource list	

New Standards to be Taught (2nd and 3rd Nine Weeks)

8.E.2: Understand the history of Earth and its life forms based on evidence of change recorded in fossil records and land forms. (4 Weeks)

- 8.E.2.1: Infer the age of Earth and relative age of rocks and fossils from index fossils and ordering of rock layers (relative dating and radioactive dating).
- 8.E.2.2: Explain the use of fossils, ice cores, composition of sedimentary rocks, faults, and igneous rock formations found in rock layers as evidence of the history of the Earth and its changing life forms.

Learning Targets/Essential Questions:

- I can identify types of fossils based on how they were formed.

- I can explain how fossil evidence supports the geological time scale.
- I can explain how the geological time scale shows the major events and diversity life forms in Earth's history.
- I can identify the four main time eras and the events that characterize them.
- I can differentiate between relative and absolute age.
- I can give examples of absolute and relative dating.
- I can understand how index fossils are used to help determine the age of rocks and rock layers.
- I can interpret the rock cycle.
- I can explain how ice cores are used to determine how Earth's climate has changed over time.

Key Vocabulary

8.E.2.1	***8.E.2.2***
• Fossil • Mold fossil • Cast fossil • Petrified fossil • Preserved fossil • Carbonized fossil • Trace fossil • Index fossil • Fossil Record • Relative Age • Radiometric dating • Extinction • Geologic Time Scale • Precambrian Era • Paleozoic Era • Mesozoic Era • Cenozoic Era	• Law of Superposition • Sedimentary rock • Igneous rock • Ice Cores • Fault • Rock Cycle • Radiometric dating • Absolute dating
Key Concepts and Skills • Fossils & Fossil Types • Geologic time • Mass Extinction • Rock Cycle	Resources • See Randolph County Schools website for resource list

• Relative Dating • Absolute Dating • Ice Core	

New Standards to be Taught (3rd Nine Weeks)

8.L.4: Understand the evolution of organisms and landforms based on evidences, theories and processes that impact the Earth over time. (3 Weeks)

- 8.L.4.1: Summarize the use of evidence drawn from geology, fossils, and comparative anatomy to form the basis of biological classifications systems and the theory of evolution.
- 8.L.4.2: Explain the relationship between genetic variation and an organism's ability to adapt to its environment.

Learning Targets/Essential Questions:

- I can explain the Theory of Evolution.
- I can explain Plate Tectonics Theory.
- I can explain the Law of Superposition.
- I can apply the law of superposition to determine the relative age of the fossils.
- I can provide examples of natural selection.
- I can explain the adaptations of organisms over time due to changes in their environment.
- I can justify the importance of a biological classification system.
- I can classify organisms.
- I can summarize the importance of the fossil record.
- I can explain why most species that have lived on earth are now extinct.
- I can compare organisms to see if they share common ancestors.
- I can conclude how moving continental plates may have influenced past environments.
- I can explain how the movements of tectonic plates can cause changes in climate and geologic features.

Key Vocabulary	
8.L.4.1	***8.L.4.2***
• Biological Evolution • Theory of Evolution • Geological Evolution • Plate Tectonics Theory	• Genetic variation • Phenotype • Offspring

• Pangaea • Fossil record • Law of Superposition • Biological evolution • Natural Selection • Biological Classification • Charles Darwin • Adaptation • Extinction • Genetic Variation • Mutation • Species • Taxonomy	

New Standards to be Taught (3rd 9 Weeks)

8.L.1: Understand the hazards caused by agents of diseases that affect living organisms (2 Weeks)

- 8.L.1.1: Summarize the basic characteristics of viruses, bacteria, fungi, and parasites relating to the spread, treatment, and prevention of disease
- 8.L.1.2: Explain the difference between epidemic and pandemic as it relates to the spread, treatment, and spread of disease.

Learning Targets/Essential Questions:

- I can explain how viruses, bacteria, fungi, and parasites infect the body and interfere with normal body functions.
- I can discuss how viruses spread in the human body.
- I can describe how bacteria reproduce and mutate.
- I can differentiate between a virus, bacteria, fungi, and Protists.
- I can explain how parasites can cause disease.

- I can explain different types of treatments for diseases caused by viruses, bacteria, and fungi.
- I can compare and contrast an epidemic and a pandemic.
- I can explain how diseases are transmitted and spread.
- I can identify ways to treat disease.
- I can explain methods of preventing diseases.
- I can give examples of diseases caused by specific microbes.

Key Vocabulary

8.L.1.1	***8.L.1.2***
• Microbiology • Microbe • Pathogen • Virus • Host Cell • Vaccine • Parasite • Host cell • Bacteria • Prokaryotic • Antibiotics • Binary Fission • Fungi • Protozoa • Algae • Mutant	• Outbreak • Epidemic • Pandemic • Infectious disease
Key Concepts and Skills • Microbes • Diseases • Epidemics • Pandemics • Treatment of disease • Prevention of disease	Resources • See Randolph County Schools website for resource list

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New Standards to be Taught (3rd and 4th Nine Weeks)

8.L.3: Understand how organisms interact with and respond to the biotic and abiotic components of their environment. (3 Weeks)

- 8.L.3.1: Explain how factors such as food, water, shelter, and space affect populations in an ecosystem.
- 8.L.3.2: Summarize the relationship among producers, consumers, and decomposers including the positive and negative consequences of such interactions including:
  - Coexistence and cooperation
  - Competition (predator/prey)
  - Parasitism
  - Mutualism
- 8.L.3.3: Explain how the flow of energy within food webs is interconnected with the cycling of matter (including water, nitrogen, carbon dioxide, and oxygen).

Learning Targets/Essential Questions:

- I can differentiate between abiotic and biotic factors.
- I can identify limiting factors within an ecosystem and discuss the impact they have on the populations of organisms within the ecosystem.
- I can identify the levels of organization of living things.
- I can define population density.
- I can organize and group organisms as producers, consumers, and decomposers in both an ecosystem and a food web/food chain.
- I can illustrate the processes of photosynthesis and describe how energy flows from the sun to producers to consumers and to decomposers.
- I can explain the impact of symbiotic relationships on an ecosystem.
- I can explain the interconnectedness of aquatic and terrestrial food chains.
- I can create a food chain when given the information about the environment.
- I can assess the similarities and differences between a food web and a food chain.
- I can model the flow of energy through an ecosystem using an energy pyramid.

Key Vocabulary		
8.L.3.1	***8.L.3.2***	***8.L.3.3***
• Biodiversity	• Coexistence	• Aquatic Food Chain

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• Abiotic Factor • Biotic Factor • Limiting Factor • Density Dependent Factor • Density Independent Factor • Ecosystem • Community • Population • Species • Population Density	• Symbiotic relationship • Mutualism • Ecological niche • Parasitism • Commensalism • Predation • Predator • Prey • Competition • Food Web	• Producers • Consumers • Omnivore • Carnivore • Decomposer • Terrestrial Food Chain • Nitrogen Cycle • Carbon Cycle • Autotroph • Heterotroph • Energy Pyramid • Number pyramid • Biomass pyramid

Key Concepts and Skills	Resources
• Biotic and Abiotic Factors • Interactions of Organisms • Terrestrial and Aquatic Food Chains and Food Webs • Competition • Symbiosis • Limiting Factors • Energy flow through an ecosystem	• See Randolph County Schools website for resource list

New Standards to be Taught (4th Nine Weeks)

8.L.5: Understand the composition of various substances as it relates to their ability to serve as a source of energy and building materials for growth and repair of organisms. (2 Weeks)

- 8.L.5.1: Summarize how food provides the energy and the molecules required for building materials, growth and survival of all organisms (to include plants)
- 8.L.5.2: Explain the relationship among a healthy diet, exercise, and the general health of the body (emphasis on the relationship between respiration and digestion)

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Learning Targets/Essential Questions:

- I can summarize ways in which food provides energy and necessary nutrients to organisms through cellular respiration.
- I can explain and illustrate the process in which photosynthesis transforms light energy into chemical energy.
- I can describe how glucose is used for building cellular structures.
- I can identify organic compounds and their use for growth and survival.
- I can explain how healthy diets and exercise relate to good health among humans.
- I can describe the relationship between respiration and digestion.
- I can list the factors which affect the overall metabolic rate in the human body.
- I can describe the affect poor lifestyle choices have on long term body health.

Key Vocabulary

8.L.5.1	***8.L.5.2***
• Glucose • Protein • Sugar • Carbohydrate • Lipid • ATP • Cellular Respiration • Photosynthesis	• Respiration • Digestion • Circulation • Metabolism • Basal metabolic rate (BMR) • Calories • Homeostasis
Key Concepts and Skills • Cell Structure (review) • Mitosis/Meiosis • Cellular energy • Photosynthesis • Cellular Respiration • Body health	Resources • See Randolph County Schools website for resource list

New Standards to be Taught (4th Nine Weeks)

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8.L.2: Understand how biotechnology is used to affect living organisms. (1 Week)

- 8.L.2.1: Summarize aspects of biotechnology including:
  - Specific genetic information available
  - Careers
  - Economic benefits to North Carolina
  - Ethical Issues
  - Implications for agriculture

Learning Targets/Essential Questions:

- I can identify economic benefits of biotechnology in North Carolina, which include agriculture, medicine, and the environment.
- I can explore careers in biotechnology.
- I can debate the ethics of Genetic Modification and cloning.

Key Vocabulary

8.L.2.1

- Biotechnology
- Ethical issues
- Gene
- Cloning
- Genetic modification
- Bioremediation

Key Concepts and Skills	Resources
• Careers • NC Economic Benefits • Ethical Issues	• See Randolph County Schools website for resource list

Spiral Review for EOG (4th Nine Weeks)

- **Review all standards for EOG test (5 Weeks)**