



Randolph County School System 6-8 Curriculum Pacing

7th Grade Science At a Glance

| 1st Quarter | 2nd Quarter | 3rd Quarter | 4th Quarter |
|---|---|---|--|
| Intro/Getting to know students/Scientific Method 2 Weeks 7.E.1 Atmosphere – 7 Weeks (7.E.1.1, 7.E.1.2, 7.E.1.3, 7.E.1.4, 7.E.1.5, and 7.E.1.6) | 7.L.1 Living Organisms & Cells – 9 Weeks (7.L.1.1, 7.L.1.2, and 7.L.1.3) (the rest of 7.L.1 will roll over into 3 rd quarter) | 7.L.1 Living Organisms & Cells – 5 Weeks (7.L.1.4 only) 7.L.2 Genetics – 4 Weeks (7.L.2.1, 7.L.2.2, and 7.L.2.3) | 7.P.1 Forces and Motion – 3 Weeks (7.P.1.1, 7.P.1.2, 7.P.1.3, and 7.P.1.4) 7.P.2 Energy – 3 Weeks (7.P.2.1, 7.P.2.2, 7.P.2.3, and 7.P.2.4) Review – 3 Weeks |



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7th Grade Science 1st Quarter Pacing

Intro, Getting to Know Students, & Review of Scientific Method and Measurement (2 Weeks)

Learning Targets/Essential Questions:

- I can design and implement an experiment to test a hypothesis.
- I will be able to measure volume, length, and mass using the metric system.
- I can identify the variables in an experiment
- I can criticize faulty practice in an experiment.
- I can defend the importance of controlling variables in an experiment.
- I can evaluate the importance of various skills in science, such as observing, classifying, measuring and predicting.

Key Vocabulary

Intro

- Hypothesis
- Independent Variable
- Dependent Variable
- Constant
- Control
- Predict
- Conclusion
- Infer
- Observation
- Classify
- Theory
- Law

Key Concepts and Skills

- Scientific method
- Measurement
- Lab tools
- Technology
- Science skills

Resources

- See Randolph County Schools website for resource list



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New Standards to be Taught

7.E. 1: Understand how the cycling of matter (water and gases) in and out of the atmosphere relates to Earth's atmosphere, weather and climate, and the effects of the atmosphere on humans. (7 Weeks)

- 7.E.1.1: Compare the composition, properties, and structure of Earth's atmosphere to include: mixtures of gases and differences in temperature and pressure within layers.
- 7.E.1.2: Explain how the cycling of water in and out of the atmosphere and atmospheric conditions relate to the weather patterns on Earth.
- 7.E.1.3: Explain the relationship between the movement of air masses, high and low pressure systems, and frontal boundaries to storms (including thunderstorms, hurricanes, and tornadoes) and other weather conditions that may result.
- 7.E.1.4: Predict weather conditions and patterns based on information obtained from:
 - Weather data collected from direct observations and measurement (wind speed and direction, air temperature, humidity and air pressure)
 - Weather maps, satellites, and radar
 - Cloud shapes and types and associated elevation
- 7.E.1.5: Explain the influence of convection, global winds, and the jet stream on weather and climatic conditions.
- 7.E.1.6: Conclude that the good health of humans requires: monitoring the atmosphere, maintaining air quality, and stewardship.

Learning Targets/Essential Questions:

- I can identify and order the layers of the atmosphere from the lowest to the highest.
- I can create a chart showing the makeup of the atmosphere, and give examples of solids, liquids and gases, as well as the differences in pressure and temperature.
- I can compare and contrast air pressure and temperature differences at varying altitudes.
- I can infer how the ozone layer affects our everyday lives and how our interactions can impact the quality of the ozone layer.
- I can create a poster to encourage environmental awareness to others with suggested habits that improve air quality.
- I can create a cause/effect graphic organizer to show how we impact the atmosphere and how the atmosphere impacts humans.
- I can infer how humans impact the Greenhouse Effect.
- I can illustrate the water cycle and describe the role of the sun and the energy change within each step.



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- I can explain the role of convection, Coriolis Effect, and Jet Stream in the atmosphere.
- I can identify the air masses on a US map and indicate the characteristics of each.
- I can predict the effect a high or low-pressure system will make on the weather conditions of a given location.
- I can recognize the different fronts from an illustration.
- I can determine the causes of 3 or more types of severe weather.
- I can predict weather that will result from each type of front.
- I can predict the wind direction and speed by interpreting isobars on a weather map.
- I can infer the weather produced by clouds based on their shape and altitude (3 main cloud types)
- I can predict weather by observing different cloud types.

Key Vocabulary

| 7.E.1.1 | 7.E.1.2 | 7.E.1.3 | 7.E.1.4 | 7.E.1.5 | 7.E.1.6 |
|--|---|--|--|--|--|
| <ul style="list-style-type: none"> • Atmosphere • Troposphere • Stratosphere • Ultraviolet Radiation • Ozone Layer • Ionosphere • Thermosphere • Mesosphere • Exosphere | <ul style="list-style-type: none"> • Evaporation • Condensation • Precipitation • Infiltration • Collection • Runoff • Groundwater • Transpiration • Weather | <ul style="list-style-type: none"> • Air Mass • Front (Cold & Warm) • Coriolis Effect • Occluded Front • Stationary Front | <ul style="list-style-type: none"> • Meteorologist • Humidity • Isobar • Isotherm • Cumulus Clouds • Stratus Clouds • Cirrus Clouds • Nimbus Clouds • Dew Point | <ul style="list-style-type: none"> • Convection • Global Winds • Jet Stream | <ul style="list-style-type: none"> • Chlorofluorocarbons • Photochemical Smog • Fossil Fuels • Climate Change • Global Warming • Greenhouse Effect • CO₂ Emissions |
| Key Concepts and Skills <ul style="list-style-type: none"> • Atmosphere Layers • Air Pressure • Ozone Layer • Greenhouse Effect/Gases • Ionosphere • Human Interactions with the atmosphere • Global Warming • Ground Level Ozone • Alternate Energy | | | Resources <ul style="list-style-type: none"> • See Randolph County Schools website for resource list | | |



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| <ul style="list-style-type: none">• Fossil Fuels• Influences of Weather• Water cycle• Transfer of Heat Energy• Weather relationships• Weather patterns• Weather Applications• Forecasting | |
|--|--|



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7th Grade Science 2nd Quarter Pacing

New Standards to be Taught

7.L.1: Understand the processes, structures, and functions of living organisms that enable them to survive, reproduce, and carry out the basic functions of life. (9 Weeks)

- 7.L.1.1: Compare the structures of life functions of single-celled organisms that carry out all the basic functions of life including
 - Euglena
 - Amoeba
 - Paramecium
 - Volvox
- 7.L.1.2: Compare the structures and functions of plant and animal cells, including major organelles (cell membrane, cell wall, nucleus, chloroplasts, mitochondria, and vacuoles).
- 7.L.1.3: Summarize the hierarchical organization of multi-cellular organisms from cells to tissues to organs to systems to organisms

Learning Targets/Essential Questions:

- I can explain how the advancement of the microscope led to the development of the cell theory.
- I can list the three main parts of the cell theory and recognize how they relate to living things.
- I can utilize a microscope to identify characteristics of various living organisms. (Including volvox, euglena, paramecium, and amoeba)
- I can understand and explain the seven basic functions living things need in order to survive.
- I can identify differences in the needs of various living things.
- I can explain why homeostasis is essential to the survival of living organisms (internal regulation).
- I can distinguish the type of movement a single-celled organism would exhibit based on its structures.
- I can compare and contrast the methods of obtaining nourishment among various microorganisms.
- I can identify the major organelles of the single celled organism (nucleus, cell membrane, mitochondria, and ribosomes)
- I can explain the role the major organelles play in meeting the survival needs of the organism.
- I can compare and contrast a plant and animal cell by creating a chart and assess why the cells have different needs.
- I can distinguish between prokaryotic and eukaryotic cells and provide an example of each.



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- I can create a graphic organizer that shows the levels of organization of a multi-cellular organism.

Key Vocabulary

| 7.L.1.1 | 7.L.1.2 | 7.L.1.3 |
|---|---|--|
| <ul style="list-style-type: none"> Homeostasis Movement Respiration Growth Adaptation Metabolism Excretion Reproduction Cilia Pseudopod Flagella Eyespot Photosynthesis Chlorophyll Colony Oral Groove/Gullet Autotroph Heterotroph DNA Chromosomes | <ul style="list-style-type: none"> Eukaryotic Prokaryotic Cell Theory Convex Magnify Pre-Existing Cell Nucleus Cell Wall Cytoplasm Nuclear Membrane Organelle Chloroplast Mitochondria Ribosome Vacuoles | <ul style="list-style-type: none"> Unicellular Multicellular Cells Tissue Organ Organ System Organism |
| Key Concepts and Skills <ul style="list-style-type: none"> The Cell Theory Microscope Basic functions of living things: movement, respiration, growth, adaptation, metabolism, excretion, reproduction Structures of microorganisms that allow them to | Resources <ul style="list-style-type: none"> See Randolph County Schools website for resource list | |



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meet life functions: Protists, Amoeba, Euglena,
Paramecium, Volvox

- Structure and function of plant and animal cells
- Parts of the cell
- Organization of multicellular organisms



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7th Grade Science 3rd Quarter Pacing

New Standards to be Taught

7.L.1: Understand the processes, structures, and functions of living organisms that enable them to survive, reproduce, and carry out the basic functions of life. (5 Weeks)

- 7.L.1.4: Summarize the general functions of the major systems of the human body (digestion, respiration, reproduction, circulation, and excretion) and ways that these systems interact with each other to sustain life.

7.L.2: Understand the relationship of the mechanisms of cellular reproduction, patterns of inheritance, and external factors to potential variation among offspring. (4 Weeks)

- 7.L.2.1: Explain why offspring that result from sexual reproduction (fertilization and meiosis) have greater variation than offspring that result from asexual reproduction (budding and mitosis)
- 7.L.2.2: Infer patterns of heredity using information from Punnett squares and pedigree analysis.
- 7.L.2.3: Explain the impact of the environment and lifestyle choices on biological inheritance (to common genetic diseases) and survival.

Learning Targets/Essential Questions:

- I can explain the functions of the skeletal system.
- I can explain the functions of the muscular system.
- I can compare and contrast the three types of muscles.
- I can create a model of a human arm and identify the types of joint, type of muscle, the flexor and extension, the ligament and tendon.
- I can explain the integumentary system's role in maintaining internal homeostasis.
- I can summarize the interaction between the muscular and skeletal systems contribution to movement.
- I can identify relationship between the circulatory system and respiratory system in terms of oxygen exchange in the alveoli.
- I can predict the change in heart rate and breathing rate when the activity level of a person changes.
- I can discuss and defend how the circulatory system can be described as the body's transport system.
- I can identify the relationship between the digestive and the circulatory system in terms of nutrient absorption in the villi.
- I can relate the muscular system to the digestive system by understanding and explaining peristalsis.
- I can identify and defend the reason the skin, respiratory, digestive, and urinary system are parts of the excretory system.



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- I can explain how smoking and poor eating habits can affect body systems negatively.
- I can diagram the way that the nervous system relates to all body systems and include specific examples. (regulation and control)
- I can create a flow chart to show the steps involved in an immune response.
- I can create flow chart to show the relationships between the gland, hormone, target cells and response.
- I can order the stages of human development from conception to birth (zygote → embryo → fetus).
- I can explain the relationship between the endocrine system and the reproductive system in terms of human development.
- I can explain why DNA replication is important for asexual reproduction to occur.
- I can identify from a diagram the different types of asexual reproduction - such as budding, fission, regeneration.
- I can recognize how the steps of mitosis lead to the creation of two identical daughter cells.
- I can explain how cancer can relate to mitosis.
- I can recognize how the steps of meiosis lead to the creation of sex cells (gametes).
- I can compare and contrast mitosis and meiosis.
- I can distinguish between haploid and diploid cells.
- I can identify the relationship of haploid and diploid cells to meiosis and mitosis.
- I can explain how sexual reproduction leads to fertilization and variation in a species. (Genetic Diversity)
- I can explain the relationship between correct meiosis and genetic disorders.
- I can use a Punnett square to predict the genotypes and phenotypes of resulting offspring.
- I can differentiate between homozygous and heterozygous genotypes and their relationship to dominant and recessive traits.
- I can analyze a pedigree to determine the genotype and phenotype of different people in a family.
- I can identify the pros and cons of scientists using selective breeding and provide examples of scientists using selective breeding to improve human life.
- I can predict the possible outcomes of genetic disorders using a pedigree.
- I can provide examples of ways the environment can change the characteristics of an organism.
- I can explain how lifestyle choices could affect the possibility of genetic diseases and survival, such as smoking and lung cancer.



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| Key Vocabulary | | | | |
|--|---|--|---|--|
| 7.L.1.4 - Muscular | 7.L.1.4 - Skeletal | 7.L.1.4 - Integumentary | 7.L.1.4 - Respiratory | 7.L.1.4 - Circulatory |
| <ul style="list-style-type: none"> • Smooth Muscle • Cardiac Muscle • Skeletal Muscle • Voluntary Muscle • Involuntary Muscle • Tendon | <ul style="list-style-type: none"> • Marrow • Ligament • Joint | <ul style="list-style-type: none"> • Skin • Hair • Nails • Cuticle • Perspiration • Melanin • Sebaceous Gland | <ul style="list-style-type: none"> • Pharynx • Larynx • Trachea • Bronchi • Alveoli • Diaphragm | <ul style="list-style-type: none"> • Artery • Vein • Capillary • Atrium • Ventricle |
| 7.L.1.4 - Digestive | 7.L.1.4 - Excretory | 7.L.1.4 - Nervous | 7.L.1.4 - Immune | 7.L.1.4 - Reproductive & Endocrine |
| <ul style="list-style-type: none"> • Chemical Digestion • Mechanical Digestion • Peristalsis • Villi • Chyme | <ul style="list-style-type: none"> • Kidney • Nephron • Ureter • Bladder • Urethra | <ul style="list-style-type: none"> • Neuron • Synapse • Brain • Spinal Cord • Electrical Impulse • Reflex | <ul style="list-style-type: none"> • Antigen • Antibody • Immunity • Vaccinations | <ul style="list-style-type: none"> • Hormone • Testes • Ovaries • Zygote • Embryo • Gland • Target Cell • Response • Negative Feedback • Positive Feedback |
| 7.L.2.1 | | 7.L.2.2 | | 7.L.2.3 |
| <ul style="list-style-type: none"> • DNA • Chromosome • Replication • Budding • Fission • Regeneration • Asexual Reproduction | | <ul style="list-style-type: none"> • Heredity • Allele • Gene • Genetics • Pedigree • Punnett Square • Dominant Trait | | <ul style="list-style-type: none"> • Mutation • Carrier • Limiting Factor • Adaptations |



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| <ul style="list-style-type: none">• Offspring• Daughter Cells• Diversity• Mitosis• Meiosis• Haploid• Diploid• Fertilization• Gamete• Sexual Reproduction• Fusion• Sex Cell | <ul style="list-style-type: none">• Recessive Trait• Genotype• Phenotype• Heterozygous• Homozygous• Selective Breeding | |
| <p>Key Concepts and Skills</p> <ul style="list-style-type: none">• Support and Movement: Integumentary System (skin), Skeletal System, Muscular System• Energy: Circulatory System & Circulation, Respiratory System & Respiration, Digestive System & Digestion, Excretory System & Excretion• Control: Nervous System, Endocrine System, Reproductive System, Immune System• Cellular Reproduction• Mitosis• Asexual Reproduction• Meiosis & Fertilization• Sexual Reproduction• Patterns of Heredity• Mendelian Genetics• Punnett Squares• Pedigree• Selective Breeding in agriculture• "Survival of the Fittest" | <p>Resources</p> <ul style="list-style-type: none">• See Randolph County Schools website for resource list | |



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| <ul style="list-style-type: none">• Genetic Disorders• Population Limiting Factors• Environmental Influences• Adaptations | |
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Randolph County School System 6-8 Curriculum Pacing

7th Grade Science 4th Quarter Pacing

New Standards to be Taught

7.P.1: Understand motion, the effects of forces on motion and the graphical representations of motion. (3 Weeks)

- 7.P.1.1: Explain how the motion of an object can be by position, direction of motion, and speed with respect of some other objects.
- 7.P.1.2: Explain the effects of balanced and unbalanced forces acting on an object (including friction, gravity, and magnets).
- 7.P.1.3: Illustrate the motion of an object using a graph to show a change in position over a period of time.
- 7.P.1.4: Interpret distance versus time graph for a constant speed and variable motion.

7.P.2: Understand forms of energy, energy transfer, and transformation and conservation in mechanical systems. (3 Weeks)

- 7.P.2.1: Explain how kinetic and potential energy contribute to the mechanical energy of an object.
- 7.P.2.2: Explain how energy can be transformed from one form to another (specifically potential energy in kinetic energy) using a model or diagram of a moving object (roller coaster, pendulum, or cars on ramps as examples).
- 7.P.2.3: Recognize that energy can be transferred from one system to another when two objects push or pull on each other over a distance (work) and electrical circuits require a completely loop through which an electrical current and past.
- 7.P.2.4: Explain how simple machines such as in Pulley planes, pulleys, levers, and wheel and axles are used to create mechanical advantage and increased efficiency.

Learning Targets/Essential Questions:

- I can explain the importance of an object's reference point in determining motion.
- I can calculate the speed, time, or distance of an object in motion using the equation: $\text{speed} = \text{distance} \div \text{time}$.
- I can compare and contrast speed and velocity and acceleration.
- I can determine an object's speed based on a distance time graph.
- I can construct and analyze a distance/time graph.
- I can compare and contrast balanced and unbalanced forces.
- I can predict the change in motion an object will experience based on the force to be applied.
- I can explain Newton's Laws of Motion using examples of everyday life.
- I can understand how the concepts of inertia (1st Law), applied force (2nd Law), and reactions (3rd Law) relate to Newton's Laws of Motion.



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- I can conduct a lab showing inertia.
- I can infer that an object that possesses mechanical energy is able to do work.
- I can create a diagram that shows the transfer of potential to kinetic energy.
- I can compare and contrast potential and kinetic energy.
- I can give examples of how energy can travel in different forms such as light, sound, and electricity.
- I can create a manipulative with examples of each type of energy transfer (thermal, mechanical, electrical, and electromagnetic waves).
- I can explain the role of a loop in an electrical circuit.
- I can create a graphic organizer that shows how electrical energy can be generated by wind, water, solar or fossil fuels.
- I can explain energy loss in Law of Conservation of Energy. (heat)
- I can calculate the amount of work done when an object is moved a given distance by a given force using the formula $\text{work} = \text{force} \times \text{distance}$
- I can illustrate examples of the types of simple machines.
- I can calculate the mechanical advantage of a simple machine.
- I can evaluate which simple machine will allow me to gain the most efficiency based on its design.
- I can design a compound machine using two or more simple machines.

Key Vocabulary

| 7.P.1.1 | 7.P.1.2 | 7.P.1.3 | 7.P.1.4 |
|---|--|---|--|
| <ul style="list-style-type: none"> • Reference Point • Distance • Speed • Velocity • Average Speed • Constant Speed • Acceleration | <ul style="list-style-type: none"> • Force • Balanced Force • Unbalanced Force • Newton's Laws of Motion • Applied Force • Mass • Friction • Oppose • Resist • Gravity | <ul style="list-style-type: none"> • Graph • Direction • Time • Axis • Slope | <ul style="list-style-type: none"> • Directly Proportional • Indirectly Proportional |



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|---|--|---|--|
| | <ul style="list-style-type: none"> • Magnetic • Inertia • Positive Acceleration • Negative Acceleration (Deceleration) | | |
| 7.P.2.1 | 7.P.2.2 | 7.P.2.3 | 7.P.2.4 |
| <ul style="list-style-type: none"> • Energy • Work • Mechanical Energy • Potential Energy • Kinetic Energy | <ul style="list-style-type: none"> • Energy Transfer • Light • Sound • Electricity | <ul style="list-style-type: none"> • Thermal Transfer • Mechanical Transfer • Electrical Transfer • Electromagnetic Transfer • Battery • Generator • Circuit • Green Energy • Conservation | <ul style="list-style-type: none"> • Machine Mechanical Advantage Efficiency • Lever • Pivot • Fulcrum • Effort • Pulley • Wheel and Axel • Inclined plane • Wedge Screw • Threads • Compound Machine |
| Key Concepts and Skills <ul style="list-style-type: none"> • Motion • Speed • Direction • Reference Point • Balanced Forces • Unbalanced Forces • Newton's Laws of Motion • Change in Position over Time • Distance Verses Time • Transfer of Energy • Kinetic Energy | | Resources <ul style="list-style-type: none"> • See Randolph County Schools website for resource list | |



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| <ul style="list-style-type: none">• Potential Energy• Mechanical Energy• Conservation of Energy• Electrical Energy• Work• Simple Machines• Mechanical Advantage Efficiency | |
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