



Science Biology 1st Nine Weeks



This academic overview can be used to monitor and support your child's at-home learning progress.

Unit 1: Introduction to Biology and Cells

Student Learning Targets

- I can describe the structure of a virus.
- I can compare the structures of viruses to cells.
- I can describe the different types of biomolecules and their functions.

Questions to Check for Unit Understanding

- What are the different types of biomolecules?
- What are the functions of each biomolecule?
- How do biomolecules work together in cells?
- How are viruses and cells similar? Different?
- Why are viruses considered nonliving?

Key Academic Vocabulary

- Biomolecule: a molecule that is produced by living things
- Carbohydrate: a biomolecule that is used as a primary energy source and a structural component for plants
- Lipid: a biomolecule that contains long-term energy storages and is a structural component of membranes
- Nucleic Acid: a biomolecule that is the storage and transfer of genetic code
- Protein: a biomolecule that is a metabolic regulator
- Virus: a particle that infects host cells and uses the host cell to replicate into more particles

Unit 2: Cellular Processes for Homeostasis

Student Learning Targets

- I can define and give examples of homeostasis.
- I can investigate and explain how an organism maintains homeostasis.

Questions to Check for Unit Understanding

- How do cells maintain homeostasis?
- How does cell transport support dynamic homeostasis?
- What will happen if a cell is placed in a hypertonic, hypotonic, or isotonic solution?

Key Academic Vocabulary

- Homeostasis: the tendency of a system to maintain constant internal condition
- Cellular Transport: the movement of molecules or water across a cell membrane

Unit 3: Cellular Processes for Energy

Student Learning Targets

- I can explain the process of photosynthesis using its reactants and products.
- I can explain the process of cellular respiration using its reactants and products.
- I can compare the reactants and products of photosynthesis and cellular respiration in terms of energy, energy conversions, and matter.

Questions to Check for Unit Understanding

- What is the relationship between photosynthesis and cellular respiration?
- How does photosynthesis and cellular respiration relate to the carbon cycle?
- What is the enzyme-substrate model?
- What are three factors that can change the structure and function of enzymes?

Key Academic Vocabulary

- Cellular Respiration: the process in which cells convert chemical energy into useful energy
- Photosynthesis: the process in which organisms convert carbon dioxide and water into glucose and oxygen
- Enzymes: proteins that change the rates of reactions within the body



Science Chemistry 1st Nine Weeks



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Unit 1: Investigating Matter

Student Learning Targets

- I can identify matter based on chemical or physical properties.
- I can describe the different types of changes that matter can undergo.
- I can classify matter based on its chemical composition (properties).

Questions to Check for Unit Understanding

- What are the differences between physical and chemical properties?
- Why is it important to distinguish between a chemical and physical change?
- What properties distinguish solids, liquids, and gasses from each other?
- How does the particle structure of a solid, liquid, or gas affect its shape, volume and compressibility?

Key Academic Vocabulary

- Chemical Property: characteristic that can only be observed or measure through a chemical reaction
- Physical Property: properties that describe matter such as color, feel, smell, boiling point, melting point, and density
- Chemical Change: a change that occurs when a new substance is created with different properties
- Physical Change: a change in a substance that does not change its chemical identity

Unit 2: Atomic Structure and the Periodic Table

Student Learning Targets

- I can describe one property for each of the different chemical families on the periodic table.
- I can identify the location of the elements that make up each chemical family on the periodic table.
- I can describe the electromagnetic spectrum.
- I can list the types of electromagnetic radiation in order of increasing wavelength.
- I can state the relationship between wavelength, energy and frequency.

Questions to Check for Unit Understanding

- How can the periodic table be used to predict the properties of an element?
- How do the physical and chemical properties of elements play a role in the development of the periodic table?
- How was the structure of an atom determined without the ability to see an atom?
- What are the properties of the alkali metals, alkaline earth metals, halogens, and noble gases?
- What is the electromagnetic spectrum?
- What is the mathematical relationship between frequency and wavelength of an energy wave?

Key Academic Vocabulary

- Chemical Families: the vertical columns on the Periodic Table where elements with similar properties are placed
- Electromagnetic Spectrum: a continuum of all electromagnetic waves organized according to frequency and wavelength
- Frequency: the number of wave cycles that pass in a given point for a specific time
- Wave: a disturbance of particles or a field that transfers energy
- Wavelength: the distance between two adjacent points of a wave



Science Physics 1st Nine Weeks



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Unit 1: One Dimensional Motion

Student Learning Targets

- I can create line graphs from data sets to show changes in velocity and position over a period of time.
- I can interpret patterns on v/t and x/t graphs to identify changes in velocity and position.
- I can express different motions like acceleration and constant velocity using vectors, diagrams, and other visual tools.
- I can differentiate between distance and displacement.
- I can differentiate between speed, velocity, and acceleration.

Questions to Check for Unit Understanding

- In which circumstances are vector quantities useful to describe the motion of an object and in which circumstances are scalar quantities useful?
- How does the shape of graphs representing the relationship between displacement, velocity, or acceleration vs. time offer information about the motion of an object?
- How is the vertical motion of an object affected by the acceleration of gravity?
- How can we calculate the rate of change of objects in different units and measurement systems?
- How does the description of motion of an object change depending on the reference frame used to describe it?

Key Academic Vocabulary

- Displacement: the vector quantity that gives a straight line distance from starting to ending position
- Velocity: the rate of change of position of an object moving in a specific direction
- Acceleration: the rate of change in velocity; speeding up, slowing down, or changing direction

Unit 2: Projectile Motion

Student Learning Targets

- I can resolve a two-dimensional vector representing the velocity of a projectile into its one-dimensional components graphically.
- I can resolve a two-dimensional vector representing the velocity of a projectile into its one-dimensional components using mathematical formulas.
- I can solve for various projectile quantities using vector mathematics and kinematic equations.

Questions to Check for Unit Understanding

- How do the resultant velocity, horizontal velocity, and vertical velocity vectors of a projectile compare throughout the time of its flight?
- Which initial conditions (initial velocity and launch angle) are optimal for striking a target a distance Δx and Δy away from the origin of motion?
- What factors other than gravity can alter the range or height of a projectile?
- How can the formulas and concepts of linear motion be used to analyze the motion of projectiles?

Key Academic Vocabulary

- Projectile: an object moving through space that has gravity as the only force acting upon it

Unit 3: Forces & Laws of Motion

Student Learning Targets

- I can predict the change in motion when the Net Forces on an object become unbalanced.
- I can calculate the amount of force required to move an object.
- I can describe Newton's three laws.

Questions to Check for Unit Understanding

- How does force affect motion?
- How do Newton's three laws explain everyday (or common) types of motion?
- Which are some of the most common types of forces that influence motion?

Key Academic Vocabulary

- Balanced Force: a situation where the net force on a system is zero
- Unbalanced Force: a situation where the net force on a system is not zero
- Equilibrium: a condition in which all competing influences are balanced



Science

Environmental Systems

1st Nine Weeks



This academic overview can be used to monitor and support your child's at-home learning progress.

Unit 1: Introduction to the Environment

Student Learning Targets

- I can assess the role of native plants and animals within a local ecosystem.
- I can compare the roles of local plants and animals within a local ecosystem to plants and animals within four other biomes.
- I can make observations and compile data about fluctuations in abiotic cycles.
- I can evaluate the effects of abiotic factors on local ecosystems.

Questions to Check for Unit Understanding

- How is a dichotomous key to identify native plants and animal species?
- What are abiotic cycles, including the rock, hydrologic, carbon, and nitrogen cycles?
- How can we evaluate the effects of abiotic factors on local ecosystems?
- How do native plants and animals affect our local ecosystem?
- How do the roles of local animals and plants play in our ecosystem compared to other ecosystems?

Key Academic Vocabulary

- Biome: a large naturally occurring community of plants and animals that have common characteristics for the environment they exist in
- Abiotic: non-living factors within an environment such as air, water, temperature, etc.
- Native Organisms: those species of plants and animals that were naturally adapted to fit the environment they are in

Unit 2: Ecological Dynamics

Student Learning Targets

- I can predict how a food chain may be altered by invasive species.
- I can make predictions about how removing an invasive species after it has been introduced may affect existing populations in an ecosystem.
- I can make predictions about how a food chain may be altered by the extinction of a species.
- I can make predictions about how existing populations may be affected by the extinction of a species.

Questions to Check for Unit Understanding

- How can I measure the concentration of a solute, solvent, and solubility of dissolved substances such as dissolved oxygen, chlorides, and nitrates?
- What happens to a population when an invasive species is introduced or removed?
- What happens to food chains and food webs when species are introduced, removed or when species become extinct?

Key Academic Vocabulary

- Invasive Species: a species that is not native to a specific location
- Food Chain: a hierarchical series of organisms each dependent on the next organism as a source of energy
- Extinction: the termination of a species