



# Science Biology 3rd Nine Weeks



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

## Unit 7: Evolution

### Student Learning Targets

- I can explain the concept of common ancestry.
- I can analyze and evaluate fossil evidence, biogeography, and homologies to determine common ancestry.
- I can explain the elements or factors of natural selection.
- I can give examples of adaptations for different organisms and explain how they allow a species to have success in their environment.

### Questions to Check for Unit Understanding

- How does the environment influence the genetics of a population?
- How can common characteristics between extinct and extant organisms provide insight in environmental conditions of the past?
- Could global climate change influence evolution?

### Key Academic Vocabulary

- Evolution: descent with modification from a preexisting species
- Natural Selection: Differences in the inherited traits and characteristics that allows a group of organisms to survive and reproduce

## Unit 8: Taxonomy and Classification

### Student Learning Targets

- I can classify organisms based on the characteristics of the six biological kingdoms, including cell type, cell number, nutrition, reproduction, and motility.
- I can compare the characteristics of taxonomic groups, including archaea, bacteria, protists, fungi, and animals.

### Questions to Check for Unit Understanding

- Which characteristics of life are significant enough to be used for classification?
- How can cladograms and phylogenetic trees demonstrate taxonomy?

### Key Academic Vocabulary

- Taxonomy: the branch of science focused on classification of organisms

## Unit 9: Animal Systems

### Student Learning Targets

- I can describe the function of each animal system and give examples of the major organs.
- I can describe the interactions that occur among systems that perform regulation in order to maintain homeostasis.
- I can describe the interactions that occur among systems that perform the functions of nutrient absorption
- I can describe the interactions that occur among systems that perform the function of reproduction.
- I can describe the interactions that occur among systems that perform the function of defense from injury or illness.

### Questions to Check for Unit Understanding

- Why is the ability to defend from injury and illness beneficial to an animal?
- If a portion of the population does not have the ability to reproduce, what are the possible implications?
- Homeostasis is maintained through which processes?

### Key Academic Vocabulary

- Interdependence: a relationship between parts of a system where each part relies on other parts
- Response: an action prompted by a stimulus



# Science Chemistry 3rd Nine Weeks



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## Unit 6: Stoichiometry

### Student Learning Targets

- I can define stoichiometry and explain how it is used in chemistry.
- I can solve stoichiometric calculations, such as mass-volume, volume-volume, and particle-mass calculations by using conversion factors derived from balanced chemical equations.
- I can determine a limiting reagent by performing mathematical calculations
- I can select the limiting reagent in a balanced chemical equation.

### Questions to Check for Unit Understanding

- What is stoichiometry?
- What is the mathematical relationship between the reactants and the products?
- How can measured quantities be manipulated using conversion factors derived from balanced chemical equations?
- How can dimensional analysis be used to calculate quantities of reactants or products involved in chemical reactions?
- How can limiting reagents be determined?
- How can limiting reagents be used to calculate the amount of products produced in a chemical reaction?

### Key Academic Vocabulary

- Stoichiometry: the calculation of the quantities of chemical elements or compounds involved in chemical reactions.
- Avogadro's number: number of units in one mole of any substance, equal to  $6.02214076 \times 10^{23}$
- Limiting reagent: the reactant that is totally consumed when the chemical reactions is complete
- Dimensional analysis: the process of converting between units
- Mole: the standard SI unit for measuring large quantities of atoms, molecules or other particles
- Mole ratio: the ratio between the amounts in moles of any two compounds involved in a chemical reaction.
- Yield: ratio of moles of product to moles of reactant usually expressed as a percentage

## Unit 7: Behavior of Gases

### Student Learning Targets

- I can calculate P, V, n or T given the other three variables and describe how a gas responds to changes in P, V, n, or T.
- I can explain the relationship between the variables in Boyle's Law, Charles' Law, Gay-Lussac's Law, and Dalton's Law of Partial Pressure.
- I can use Dalton's Law of Partial Pressure to calculate the partial pressure of any gas in a mixture, given the composition of that mixture.

### Questions to Check for Unit Understanding

- In what ways are the properties (volume, pressure, moles, temperature) of ideal gases related?
- In what ways are the properties (volume, pressure, moles, temperature) of ideal gases calculated?
- How does kinetic molecular theory explain the behavior of an ideal gas system?

### Key Academic Vocabulary

- Boyle's Law: the volume of a gas at constant temperature varies inversely with the pressure exerted on it.
- Charles's Law: the volume occupied by a fixed amount of gas is directly proportional to its absolute temperature, if the pressure remains constant.
- Dalton's Law of Partial Pressure: the total pressure of a mixture of gases is the sum of the partial pressures of its components ( $P_{\text{Total}} = P_{\text{gas 1}} + P_{\text{gas 2}} + P_{\text{gas 3}}$ )
- Ideal Gas Law: the pressure, temperature, and volume of gas are related to each other.
- Ideal Gas Constant: the ratio of the product of pressure and volume to the product of mole and temperature.
- Pressure: the force that the gas exerts on the walls of its container
- Molar Volume: the volume of 1 mole of a gas at a given temperature and pressure
- Kinetic Molecular Theory: the space between gas molecules is much larger than the molecules themselves



# Science Chemistry 3rd Nine Weeks



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## Unit 8: Behavior of Solutions

### Student Learning Targets

- I can apply solubility rules.
- I can identify solubility rules.
- I can calculate molarity of solutions.
- I can calculate the dilutions of solutions using molarity.

### Questions to Check for Unit Understanding

- Why do solutions exist?
- How can I efficiently make sweet tea?
- How does the concentration of a solute in a solution impact its use?
- Why do some solutes dissolve in water while others don't?
- How is the concentration of solutions accurately calculated?
- What is dilution of a solution and how can it be calculated?

### Key Academic Vocabulary

- Aqueous solution: a solution in which the solvent is water.
- Concentration: the ratio of solute in a solution to either solvent or total solution.
- Dilution: the reduction of the concentration of a solute in a solution by the addition of more solvent
- Dissolution: the process where a solute dissolves in a solvent to form a solution
- Molarity: the moles of a solute per liters of a solution (Also known as molar concentration),
- Solubility: the ability of a solid, liquid, or gas solute to dissolve in a solvent which is generally a liquid.
- Solution: a homogeneous mixture of one or more solutes dissolved in a solvent
- Solute: a substance dissolved in a solution
- Solvent: a substance (usually a liquid) in which other materials to dissolve to form a solution.



# Science Physics 3rd Nine Weeks



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## Unit 7: Work Energy Theorem and Power

### Student Learning Targets

- I can demonstrate that applying work to an object/system can change its kinetic energy
- I can calculate quantities using the work-energy theorem
- I can define the law of conservation as Energy is neither created nor destroyed only changed.
- I can demonstrate that energy is always conserved in a closed system.
- I can explain that energy can be released as heat in an open system.

### Questions to Check for Unit Understanding

- What is work?
- What is mechanical energy?
- How are work and mechanical energy related?
- What is power and how is it related to work?

### Key Academic Vocabulary

- Work: the change in energy of an object that is caused by the application of a force on the object over a specific distance or displacement
- Work Energy Theorem: a theorem stating that the work done on a system is equal to the change in the kinetic energy of the system
- Power: the rate of work or energy transfer per unit time

## Unit 8: Heat Transfer and Thermodynamics

### Student Learning Targets

- I can explain the four laws of thermodynamics
- I can illustrate the four laws of thermodynamics through everyday examples.
- I can explain the three processes of thermal energy transfer.
- I can illustrate the three processes of thermal energy transfer through everyday examples.

### Questions to Check for Unit Understanding

- What are the mechanisms for heat transfer from one point to another?
- How is the law of conservation of energy applied in thermodynamic systems?

### Key Academic Vocabulary

- First Law of Thermodynamics: the law stating that the total change in the internal energy of a system is the sum of the work done on the system and the heat energy added to it:  $\Delta E = q + w$
- Second Law of Thermodynamics: the law stating that, when left to itself, a system's entropy always increases, never decreases; also known as the law of entropy
- Third Law of Thermodynamics: the law stating that as the temperature of a system approaches absolute zero (-273.15°C, or 0 K), the entropy of the system will also approach zero
- Heat: energy transferred between two objects of different temperatures, moving continually in a predictable pattern from warmer site to cooler site until all sites have reached the same temperature



# Science

## Environmental Systems

### 3rd Nine Weeks



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#### Unit 6: Populations

##### Student Learning Targets

- 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.
- I can identify and describe carrying capacity.
- I can explain how population increases and decreases are related to carrying capacity.
- I can recognize that impacts to populations of geographic locales can occur.
- I can make predictions about impacts to populations of geographic locales from diseases, birth and death rates, urbanization and natural events such as migration and seasonal changes.

##### Questions to Check for Unit Understanding

- What is an environment?
- How is the environment affected by changes?
- How does the extinction of one species affect existing populations in an ecosystem?
- What are the factors that affect birth rates, death rates and fertility rates?and carrying capacity?
- What are the effects when a population meets carrying capacity?
- What are the effects when a population exceeds carrying capacity?

##### Key Academic Vocabulary

- Carrying Capacity: the largest population that an environment can support at any given time
- Growth Rate: an expression of the increase in the size of an organism or population over a given period of time
- Limiting Factor: an environmental factor that prevents an organism or population from reaching its full potential of distribution or activity
- Population: a group of organisms of the same species that live in a specific geographical area
- Population Density: the number of individuals of the same species that live in a given unit of area
- Birth Rate: the number of births that occur in a period of time in a given area
- Death Rate: the number of deaths occurring in a period of time