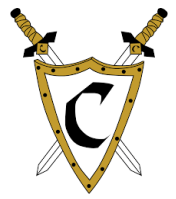




Science Course Information

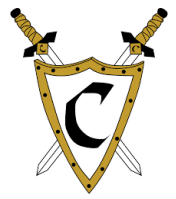


6th grade

Content Area	Learning Focuses
<i>Metric System</i>	<ul style="list-style-type: none">● Identify and convert units of measurements used in the metric system.● Using tools and instruments correctly to take measurements of length, mass, volume, and density.
<i>Geological Processes</i>	<ul style="list-style-type: none">● Model the cycling and movement of Earth's rock material and the energy that drives these processes.● Analyze and interpret data on the distribution of fossils, rocks, continental shapes, and seafloor structures to provide evidence of past plate motions.
<i>Weather, Climate, and Hydrological Cycle</i>	<ul style="list-style-type: none">● Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.● Collect data and use digital data analysis tools to identify patterns to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions.
<i>Cells to Organisms</i>	<ul style="list-style-type: none">● Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.● Develop and use a model to describe the function of a cell as a whole, the way cell parts contribute to the cell's function, and how the body is a system of interacting subsystems.
<i>Waves</i>	<ul style="list-style-type: none">● Describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.● Develop and use a model to qualitatively describe that waves are reflected, absorbed, or transmitted through various materials.



Science Course Information



7th grade

Content Area	Learning Focuses
<i>Ecology</i>	<ul style="list-style-type: none">● Evaluate solutions for maintaining biodiversity or ecosystem services.● Use a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.● Analyze data to provide evidence for the effects of resource availability on populations of organisms in an ecosystem.
<i>Intro to Cellular Respiration and Photosynthesis</i>	<ul style="list-style-type: none">● Use a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and release energy as this matter moves through an organism.● Construct an explanation for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
<i>Natural Selection</i>	<ul style="list-style-type: none">● Locate patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth.● Compare patterns of similarities in the embryological development across multiple species to identify relationships.● Explain how natural selection may lead to increases and decreases of specific traits in populations.● Construct an explanation that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.
<i>Reproduction and Genetics</i>	<ul style="list-style-type: none">● Create models to clarify information about how changes in genes can affect organisms.● Use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.



Science Course Information

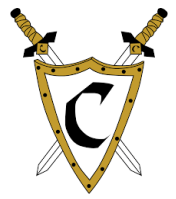


8th grade

Content Area	Learning Focuses
<i>Chemistry</i>	<ul style="list-style-type: none">• Find locations of common elements on the periodic table to note patterns in the properties of similarly grouped elements.• Conduct an investigation of changes in pure substances when thermal energy is added or removed and relate those changes to particle motion.• Analyze data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
<i>Energy</i>	<ul style="list-style-type: none">• Construct, test and modify a device that either releases or absorbs thermal energy by chemical processes.• Evaluate evidence to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.• Plan and conduct an investigation to determine how the temperature of a substance is affected by the transfer of energy, the amount of mass, and the type of matter.• Interpret graphical displays of data to describe the relationship of kinetic energy to the mass and speed of an object.
<i>Force and Motion</i>	<ul style="list-style-type: none">• Plan and conduct an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.• Design a solution to a problem involving the motion of two colliding objects using Newton's 3rd Law.• Use evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.• Develop and use scale models of solar system objects to describe the sizes of objects, the location of objects, and the motion of the objects; and include the role that gravity and inertia play in controlling that motion.
<i>Electricity and Magnetism</i>	<ul style="list-style-type: none">• Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.• Conduct an investigation to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.



Science Course Information



Earth and Environmental

Content Area	Learning Focuses
<i>Geosphere</i>	<ul style="list-style-type: none">● Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.● Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth's formation and early history.● Develop a model to illustrate how Earth's internal and surface processes operate to form continental and ocean-floor features.● Ask questions to clarify how seismic energy traveling through Earth's interior can provide evidence for Earth's internal structure.



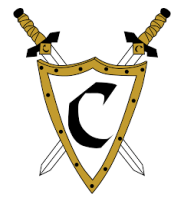
Science Course Information



	<ul style="list-style-type: none">● Evaluate the evidence and reasoning for the explanatory model that Earth's interior is layered and that thermal convection drives the cycling of matter.
<i>Hydrosphere</i>	<ul style="list-style-type: none">● Plan an investigation of the properties of water and its effects on Earth materials and surface processes.● Compare, integrate, and evaluate sources of information in order to determine how specific factors, including human activity, impact the groundwater system of a region.
<i>Atmosphere</i>	<ul style="list-style-type: none">● Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.● Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth's systems and human infrastructure.
<i>Biosphere</i>	<ul style="list-style-type: none">● Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.● Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.



Science Course Information



Biology

Content Area	Learning Focuses
<i>Living Systems</i>	<ul style="list-style-type: none">• Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.• Develop models to illustrate the hierarchical organization of interacting systems.
<i>Chemistry in Living Systems</i>	<ul style="list-style-type: none">• Construct an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.
<i>Matter and Energy in Living Systems</i>	<ul style="list-style-type: none">• Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.• Use a model to illustrate that cellular respiration is a chemical process.
<i>Cells</i>	<ul style="list-style-type: none">• Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.
<i>DNA</i>	<ul style="list-style-type: none">• Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins.
<i>Genetics and Heredity</i>	<ul style="list-style-type: none">• Make a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.• Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.
<i>Evolution and Natural Selection</i>	<ul style="list-style-type: none">• Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.• Construct an explanation based on evidence for how natural selection leads to adaptation of populations.



Science Course Information



Chemistry

Content Area	Learning Focuses
<i>Measurement and Scientific Method</i>	<ul style="list-style-type: none">● Using tools and instruments correctly to take measurements of length, mass, volume, and density.● Move numbers in and out of scientific notation.● Explain the purpose of significant figures and the process for identifying the appropriate number of digits.
<i>Matter and Its Properties</i>	<ul style="list-style-type: none">● Describe multiple methods of classifying matter.● Construct multiple models to show the composition or structure of molecules.● Calculate the formula or molecular mass of a compound.● Convert measurements between grams, particles, and moles.
<i>Temperature, Energy, and Heat</i>	<ul style="list-style-type: none">● Construct an explanation based on evidence and scientific principles of a common phenomenon that can be explained by the motions of particles and how that motion changes with temperature.● Design an investigation to evaluate the variables that determine the rate of thermal energy transfer.● Plan and conduct an investigation to determine how the temperature of a substance is affected by the transfer of energy, the amount of mass, and the type of matter.● Plan and conduct an investigation of changes in pure substances when thermal energy is added or removed and relate those changes to particle motion.
<i>Physical and Chemical Change</i>	<ul style="list-style-type: none">● Analyze and interpret data on the properties of substances before and after the substances interact to determine if a physical or chemical change has occurred.● Determine how the pressure, volume, temperature, and mass of a gas are related to each other, to predict the effect on a system of changing one of those variables.
<i>Atoms and Elements</i>	<ul style="list-style-type: none">● Use the periodic table as a model to predict the relative properties of elements based on the patterns of valence electrons.● Describe the general structure of an atom and the



Science Course Information



	<p>interactions between the subatomic particles.</p> <ul style="list-style-type: none">• Determine the number of each of the subatomic particles using the element name and patterns on the periodic table.• Develop models to describe the atomic composition of simple molecules and crystals.
<i>Compounds and Bonding</i>	<ul style="list-style-type: none">• Compare the structure of substances and infer the strength of electrical forces between particles.• Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.• Predict the properties of a compound based on the elements involved and the patterns of valence electrons.
<i>Chemical Reactions</i>	<ul style="list-style-type: none">• Support the claim that atoms, and therefore mass, are conserved during a chemical reaction.• Describe how energy moves during a chemical reaction and state if it is endothermic or exothermic.• Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.• Apply scientific principles and evidence to provide an explanation about the effects of changing the surface area, agitation, temperature, and concentration of the reacting particles on the rate at which the reaction occurs.• Calculate quantities of substances involved in a chemical reaction in moles, particles, and grams.• Determine the limiting reactant, theoretical yield and percent yield of a chemical reaction.