

## Sixth Grade Science Curriculum Altenburg Public School

Physical Science		
6-8.PS1.A.1	Develop models to describe the atomic composition of simple molecules and extended structures.	TSW describe the atomic composition of molecules, classify elementary substances and compounds using chemical formulas, and classify elementary substances and compounds using models.
6-8.PS1.A.2	Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.	TSW compare physical and chemical changes in soapmaking and food flavors.
6-8.PS1.A.4	Develop a model that describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.	TSW identify how particle motion affect temperature and pressure, changes of state of motion, and affects on temperature and pressure.
6-8.PS1.B.1	Develop and use a model to describe how the total number of atoms remains the same during a chemical reaction and thus mass is conserved.	TSW count atoms and molecules in chemical reactions, and calculate amounts of reactants or products in chemical reactions.
6-8.PS2.A.1	Apply physics principles to design a solution that minimizes the force of an object during a collision and develop an evaluation of the solution.	TSW predict forces using Newton's third law
6-8.PS2.A.2	Plan and conduct an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on	TSW identify whether objects are accelerating, how mass affect force and acceleration, and balanced and unbalanced forces.

	the object and the mass of the object.	
6-8.PS2.B.1	Analyze diagrams and collect data to determine the factors that affect the strength of electric and magnetic forces.	TSW compare magnitudes of magnetic forces.
6-8.PS2.B.2	Create and analyze a graph to use as evidence to support the claim that gravitational interactions depend on the mass of interacting objects.	TSW identify changes in gravitational potential energy.
6-8.PS3.A.1	Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.	TSW use tables and graphs to identify patterns about kinetic energy.
6-8.PS3.A.2	Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.	TSW identify changes in gravitational potential energy.
6-8.PS3.A.3	Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.	TSW predict heat flow and temperature changes, and compare thermal energy transfers.
6-8.PS3.A.4	Plan and conduct an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the temperature of the sample.	TSW identify how particle motion affect temperature.
6-8.PS3.B.1	Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object.	TSW explore how energy transformations affect roller coaster rides and bike rides.
6-8.PS4.A.1	Use mathematical representations to describe a	TSW compare amplitudes, wavelengths, and frequencies

	simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.	of waves, and compare energy of waves.
6-8.PS4.A.2	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.	TSW explore transmission, reflection, and absorption of waves.
<b>Life Sciences</b>		
6-8.LS1.A.1	Provide evidence that organisms (unicellular and multicellular) are made of cells and that a single cell must carry out all of the basic functions of life.	TSW explore different plant and animal cells.
6-8.LS1.A.2	Develop and use a model to describe the function of a cell as a whole and ways parts of the cells contribute to that function.	TSW identify functions of animal and plant cell parts, and label animal and plant cells.
6-8.LS1.A.3	Develop an argument supported by evidence for how multicellular organisms are organized by varying levels of complexity; cells, tissue, organs, organ systems.	TSW identify the human circulatory systems and label the human heart.
6-8.LS1.B.1	Construct an explanation for how characteristic animal behaviors as well as specialized plant structures affect the probability of successful reproduction of animals and plants respectively.	TSW explore how animal behaviors affect reproductive success and identify evidence to support a claim.
6-8.LS1.B.1	Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.	TSW how genes and the environment affect plant growth in both inherited and acquired traits.
6-8.LS1.C.1	Construct a scientific explanation based on	TSW identify the photosynthetic organism and

	evidence for the role of photosynthesis and cellular respiration in the cycling of matter and flow of energy into and out of organisms.	how plants use and change energy.
6-8.LS2.A.1	Analyze and interpret data to provide evidence for the effects of resource availability on individual organisms and populations of organisms in an ecosystem.	TSW use food chains to predict changes in populations.
6-8.LS2.A.2	Construct an explanation that predicts the patterns of interactions among and between the biotic and abiotic factors in a given ecosystem.	TSW classify symbiotic relationships.
6-8.LS2.B.1	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.	TSW interpret food webs and how matter move in food chains.
6-8.LS2.C.1	Construct an argument supported by empirical evidence that explains how changes to physical or biological components of an ecosystem affect populations.	TSW use food chains to predict changes in populations, and investigate primary succession on a volcanic island
6-8.LS2.C.2	Evaluate benefits and limitations of differing design solutions for maintaining an ecosystem.	TSW evaluate coral reef biodiversity and human uses.
6-8.LS4.A.1	Analyze and interpret evidence from the fossil record to infer patterns of environmental change resulting in extinction and changes to life forms throughout the history of the Earth.	TSW compare fossils to modern organisms and compare ages of fossils in a rock sequence.
6-8.LS4.B.1	Construct an explanation based on evidence that	TSW compare fossils to modern organisms.

	describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.	
6-8.LS4.C.1	Interpret graphical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.	TSW explore natural selection and construct explanations of natural selection.
<b>Earth and Space Sciences</b>		
6-8.ESS1.A.1	Develop and use a model of the Earth-sun-moon system to explain the cyclic patterns of lunar phases and eclipses of the sun and moon.	TSW analyze models of the Earth-Sun-Moon system and identify phases of the Moon.
6-8.ESS1.A.2	Develop and use a model of the Earth-sun system to explain the cyclical pattern of seasons, which includes the Earth's tilt and directional angle of sunlight on different areas of Earth across the year.	TSW explore what causes the seasons on Earth.
6-8.ESS1.B.1	Analyze and interpret data to determine scale properties of objects in the solar system.	TSW analyze data to compare properties of planets.
6-8.ESS1.C.1	Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's history.	TSW compare ages of fossils in a rock sequence.
6-8.EE2.A.1	Develop and use a model to illustrate that energy from the Earth's interior drives convection which cycles Earth's crust leading to melting, crystallization, weathering and deformation of large rock formations,	TSW classify rocks as igneous, sedimentary, or metamorphic, and label parts of a rock cycle diagram.

	including generation of ocean sea floor at ridges, submergence of ocean sea floor at trenches, mountain building and active volcanic chains.	
6-8.ESS2.A.2	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.	TSW label Earth layers, label features and describe tectonic plate boundaries.
6-8.ESS2.B.1	Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.	TSW label Earth features at tectonic plate boundaries and describe tectonic plate boundaries around the world.
6-8.ESS2.C.1	Design and develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.	TSW label parts of water cycle diagrams.
6-8.ESS2.C.2	Research, collect, and analyze data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.	TSW explore air masses, identify and compare air masses, and explain how air masses form.
6-8-ESS2.C.3	Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.	TSW identify factors affecting climate caused by latitude and distance from the ocean.
6-8.ESS3.B.1	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.	TSW analyze natural hazard maps.

6-8.ESS3.C.1	Analyze data to define the relationship for how increases in human population and per-capita consumption of natural resources impact Earth's systems.	TSW evaluate claims about natural resources in groundwater and fossil fuels.
6-8.ESS3.C.2	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	TSW explore problems with coral reef biodiversity and human uses and evaluate solutions.
6-8.ESS3.D.1	Analyze evidence of the factors that have caused the change in global temperatures over the past century.	TSW evaluate the use of fossil fuels and the greenhouse effect.
<b>Engineering, Technology, and Application of Science</b>		
6-8.ETS1.A.1	Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.	TSW identify parts of the engineering-design process, explore the engineering-design process of going to the Moon, and evaluate solutions on coral reef biodiversity and human uses.
6-8.ETS1.B.1	Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.	TSW will evaluate tests of engineering-design process.
6-8.ETS1.B.2	Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.	TSW use data from tests to compare engineering-design solutions.

6-8.ESTS.B.3	Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.	TSW explore the engineering-design process of going to the Moon.
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