ASFG Standards and Benchmarks: Scope & Sequence; Science

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	The student understands:												
	Standard 1: Atmospheric processes and the water cycle	**Standard 2:** Earth's composition and structure	**Standard 3:** The composition and structure of the universe and the Earth's place in it	**Standard 4:** The principles of heredity and related concepts	**Standard 5:** The structure and function of cells and organisms	**Standard 6:** Relationship among organisms and their physical environment	**Standard 7:** Biological evolution and the diversity of life	**Standard 8:** The structure and properties of matter	**Standard 9:** The sources and properties of energy	**Standard 10:** Forces and motion	**Standard 11:** The nature of scientific knowledge	**Standard 12:** The nature of scientific inquiry	**Standard 13:** The scientific enterprise
	McREL Benchmarks for Grades N-K												
	1.1-1.3	2.1-2.2	3.1	---	5.1-5.2	6.1	7.1	8.1-8.3	---	10.1-10.2	---	12.1-12.7	13.1-13.2
N - K	Proposes and practices measures to care for water Observes natural phenomena such as cloud movement, rain, cyclone, strong wind, leaves falling from trees					Participates in conversations of natural resources and proposes ways to preserve the environment Identifies and explains positive and negative consequences of human interactions with the natural environment Identifies environmental factors that affect school life	Observes living things, the natural environment, and natural phenomena Compares and identifies traits of living things that set them apart from non-living things	Describes characteristics of elements (color, size, texture, consistency)			Represents results of observations through drawings, diagrams, tables, charts, and images	Asks questions that express curiosity and an interest in learning about living things and nature Experiments with different elements, objects, and materials that are safe in search of solutions to problems and answers to questions about the natural environment Formulates explanations about observable natural phenomena, characteristics of living things, and natural environment Makes inferences and predictions about nature based on his/her knowledge, beliefs, and personal experiences	Participates in conversations about science

McREL Benchmarks for Grades P1-2													
	1.1 – 1.2	2.1-2.2	3.1-3.2	4.1-4.2	5.1-5.2	6.1-6.2	7.1-7.2	8.1-8.2	9.1-9.5	10.1-10.5	11.1	12.1-12.2	13.1
P1	Seasons and weather (clothing, activities, celebrations) 1.1-2 Water as a solid, liquid, gas			List baby animal names 4.1 Similarities and differences between baby and adult animals 4.1 Show how I grow and change. 4.2	Plant and animal needs Care for a pet 5.1 Hibernation and nocturnal animals 5.2 Life cycles (bird, butterfly, frog, plant) 5.1 Seed development and dispersion 5.1 Flowering plant parts 5.1 Animal and plant growth Senses 5.1	Group animals and their habitats Care of earth (recycling)	Wild animals, farm animals, pets, garden creatures Mammals vs non-mammals	Solids, liquids, gas			Scientific investigation, use of models How plants grow from seeds	Use of senses to gather data in the science lab	Working in teams and sharing results in science lab Products we get from animals
1	Earth's tilt and rotation related to seasonal changes		Earth's rotation, day sky (sun) and night sky (moon, stars) 3.1 Understand why the moon appears to change shape 3.1 Identify ways that the Sun moves 3.1		Lifecycles (animal, plant) 5.2 Animal traits related to survival 5.2 Identify ways that animals change as they grow and mature 5.2	Animal homes and habitats 6.2	Animal groups (fish, insects, birds, reptiles, amphibians, mammals)	Magnetic and non-magnetic material	Sun as source of heat and light for Earth	Speed and motion Understand that objects move at different speeds 10.5 Push and pull are forces that change the direction of an object 10.4 Magnets cause attraction and repulsion 10.1	Scientific investigation, use of models	Making observations, predictions, tools, to gather data	Working in teams and sharing results in science lab
2	Weather pattern characteristics, water cycle 1.1-2 What makes some weather patterns unique 1.1 Daylight changes related to	Properties of rock and soil Compare and contrast rocks and soils 2.2 Water and wind's affect on rocks and soil 2.2			Animal adaptations allow for survival 5.2 Living vs non-living 5.2 How do animals met their needs in different habitats 5.2	Habitats (tundra, grassland, desert, rainforest, ocean) 6.1 Conservation and pollution; causes and how to conserve. 6.1	Dinosaur characteristics Fossil shapes 7.1 Fossil records the past 7.1 Timeline of major dinosaur fossils 7.1		Sound and vibrations Identify sounds 8.1 Describe how a sound is made 8.4 Sound travels through different matter 8.4		Scientific investigation, use of models	Making observations, predictions, tools, to gather data	Working in teams and sharing results in science lab

	seasons; 4 seasons; daylight affects seasons 1.2				How to protect endangered animals 5.2 Hibernation Migration				Sound can be controlled. Pitch and volume 8.4				
McREL Benchmarks for Grades 3-5													
	1.1 – 1.4	2.1-2.5	3.1-3.6	4.1	5.1-5.3	6.1-6.5	7.1-7.2	8.1-8.4	9.1-9.5	10.1-10.6	11.1-11.4	12.1-12.5	13.1-13.3
3			Determine how and why scientists use telescopes. 3.6 Order the planets in our solar system. 3.2 Inner and outer planets and characteristic 3.2 Star vs constellation 3.3 Earth's movement in solar system. 3.2 Reason for day and night. 3.1 Reasons for phases of moon. 3.2 Asteroid vs asteroid belt.	Animal adaption necessary for survival 4.1		Animals depend on resources 6.2 Effect on animals when environment changes 6.4 Basic needs of plants. Plants use energy to make food. Animals get energy from food. Relationships among producer and consumer 6.2	Life cycles of living things. Classify different animals. Explain how animals become endangered or extinct. 7 Identify invertebrates 7.2		Different kinds of energy. Static electricity Electrical circuits Energy can change forms (chemical to electric). Waves move energy from place to place. 9.5 Radiation and heat waves Electrical energy affects the human body	Potential energy changes to kinetic energy. 10.2	Determine how and why scientists use telescopes. 3.6 Importance of using models	Do earthworms prefer dark or light. Make a boneless jelly to compare to worms. Feel and measure its body in cm. Assemble a human skeleton. Classify preserved animals as vertebrates or invertebrates. Observe the life cycle of a mealworm. 12.3 Grow the life cycle of a banana fly. Play the role of an astronaut and fly a rocket. Demonstration of energy. Build an electric circuit Classify the parts of a green onion. Observe onion cell under the microscope. Classify preserved animals as herbivores, omnivores, carnivores,	

												consumers. Build a food chain in six different habitats. Make a model of an asteroid. Measure the impact of an asteroid. Models of molecules.	
4	Explain what gases are in air. 1.3 Weather and the water cycle. 1.1 Change in climate.1.2 Severe weather	Rock cycle is and structure of earth 2.1-2 Cause of changes to Earth's surface.2.1-2 Earth's natural resources. Renewable and nonrenewable resources.			Explain the process of life. 5.1 Systems of human body.5.2		Earth's natural resources	What is matter and how do you measure it 8.2 Changes in matter 8.1			Importance of model building to explain systems of human body. Use of estimation to understand how much water there is in the world	Result of pressure change inside of a can. Effect of heat on ice. Creation of a tornado Observe rocks. Looking inside a volcano. Desalinating water. Mixing baking powder and vinegar. Making two liquids become a solid. Listening to the Heart and lungs as examples of human systems	
5	Earth's 3 major climate zones. Why seasons occur on Earth.1.2 The sun and wind affect weather systems.	Compare the earth to other planets in terms of supporting life. Forces responsible for Earth's changing surface.2.1,2.2	Common observations of day and night sky.3.1,3.3 Relationship between the Earth and the Moon.3.2 Depict the motions of the			Interdependence of plants and animals within specific habitats and communities.6.1,6.2 Habitats and communities and the relationships among the plants and animals that live in them.6.1					Interpret the symbols on a weather map or chart. Current scientific thinking about how the solar system formed.	Demonstrate how meteorologists use data to predict and track weather. Test physical properties of rocks and minerals Use	Identify several dangers in space. Explain how technology and scientific inquiry have helped us learn about the universe.

	Analyze the impact of large-scale weather systems on the local weather. Analyze the different factors that affect oceans and how they relate to global weather patterns.	Relationship between Earth's forces and Earth's surface features.2.1-2 Impact of Earth's forces on life of human being Physical properties of rocks and minerals. 2.3 Social and environmental impacts of human uses of rocks and minerals.	moon around the Earth and earth and moon around the sun..3.2 Motions of planets, moons, and comets in the solar system.3.2 Components of solar systems. Compare our sun to other stars and star systems. Explain how stars form. Position and motion of our solar system in the universe. 3.5 Characteristics of the Milky Way									technological problem-solving skills to design, build, and test devices for investigating the motions of different bodies in the solar system.1.2	Impact of space exploration on society and the environment Technological tools and devices needed for space exploration 13.1

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	McREL Benchmarks for Grades 6-8												
	1.1 – 1.7	2.1-2.8	3.1-3.7	4.1-4.5	5.1-5.8	6.1-6.5	7.1-7.5	8.1-8.10	9.1-9.9	10.1-10.5	11.1-11.3	12.1-12.8	13.1-13.6
6					Structure and function of the major organs of various human body systems Structure and function of human body systems and interactions among systems Structure and function of plant and animal cells and cell processes	Impact of human activities and technological innovations on human health Interactions within the environment. Factors that affect the balance between different components of an ecosystem Interactions between and among biotic and abiotic elements	Characteristics of living things Classify diverse organisms Biodiversity The stability of natural systems and its benefits to humans	Properties of matter and changes in matter 8.3 Changes of state and physical and chemical change Social and environmental impacts of the use and disposal of pure substances and mixtures 8.7 Properties and applications of pure substances and mixture 8.7 Characteristic of pure substances and mixtures using the particle theory 8.7 Properties and uses of fluids.	Light and sound as forms of energy that have specific characteristics and properties. 9.1 Characteristics of static and current electricity Construct simple circuits Principles of electrical energy and its transformation into and from other forms of energy Investigate the characteristics and properties of light and sound	Investigate ways in which pulleys and gears modify the speed and direction of, and the force exerted on, moving objects Basic principles and functions of pulley and gear systems Forces acting on structures and mechanisms Principles of flight and properties of air Factors in the design and building of structures and devices		Assess human impacts on biodiversity, and identify ways of preserving biodiversity Assess the impacts of human activities and technologies on the environment, and evaluate ways of controlling these impacts Investigate relationship among structure and function of animal and plant systems Construct simple circuits Construct a structure applying principles of force	Impact on society and/or environment for • technological innovations on human health • cell biology • use of pulleys and gears • use and disposal of pure substances and mixtures • use of electricity • processes used to make everyday products • flying devices • forces acting on structures and devices
7				Explain how a living thing demonstrates the characteristics of life through examples. 4.1 Use examples to show how each parent contributes half of the genetic material in their offspring. Experiments of Gregor Mendel and their	Historical events that led to the discovery of cells and their properties. 5.1 Compare and contrast how different types of cells capture and release energy Movement of materials across the cell membrane. Cell size limits the speed of cell	Ecosystems support life and living things depend on the environment. 6.1 Matter cycles through ecosystems and ecosystems need certain living materials. 6.5 Energy flows through ecosystems 6.4 Groups and individual living	Historical contribution of Darwin's studies to our understanding of evolution. 7.1 New species develop from older species depending on their environment 7.4 Early fetal development, fossils, and DNA contribute to the knowledge of	Compare and contrast organic compounds and inorganic compounds Identify the sources of organic compounds in different living things.			Historical events that led to the discovery of cells and their properties. Historical contribution of Darwin's studies to our understanding of evolution.	Use a microscope to view cells and describe how a microscope works. Calculate the magnification of a microscope. 12.5, 12.7 Research examples of how human activities contribute to an ecological issue.	Explain how modern genetics uses DNA technology.

				importance to the study of heredity. 4.4 Apply probability rules to predict characteristics of offspring. Cell division and fertilization are responsible for creating genetic diversity in offspring. 4.3 Identify DNA as the molecule that contains genetic information that codes for the characteristics of living things. 4.4 Label and identify the parts of DNA and explain where it is located in the cell. Model the process of protein synthesis from the sequence of DNA to protein Explain how modern genetics uses DNA technology. Predict how mutations affect the outcome of protein synthesis.	transport. Explain how different cells perform different functions. Function of organelles located in a plant cell and animal cell. Different organic compounds and their elements exist in different parts of the cells Use drawings to explain the complexity of the human body and its overall organization. 5.3 The human body maintains its internal conditions through the different organ systems. 5.6 Label organs of the human body. Diseases and disorders in specific organ systems and describe their effects on health. 5.8 Describe the functions of different organ systems and their role in contributing to homeostasis in the human body. 5.4, 5.6	things interact within ecosystems. 6.3	evolution.7.2 7.4 Why viruses cannot be considered living things. Importance of systems for classifying living things. Evidence to make determinations about biological relationships when classifying living things.7.5 The 7 levels of classification and explain their importance The scientific name of an organism. 7.5 Classification systems are constantly changing based on new findings. 7.5 Classify organisms based on their characteristics. 7.5 Classify different organisms by how they obtain energy. 7.5 Diversity of the animal kingdom 7.5 Describe how plants have evolved and distinguish between the four types of plants. 7.5						
8								Matter and measuring its mass and volume. Identify the smallest particles of matter, and how they combine to form molecules.	-Energy causes change; common forms of energy 9.1 -Temp and heat, measured, changed, and transferred. 9.3 -Energy can be	Describe an object's position and motion. 10.3 Calculate an object's speed and velocity. 10.3 Acceleration is			

								8.1, 8.2 Movement of atoms and molecules. Properties of matter. 8.4 Physical and chemical properties of matter and how they change. 8.3 Atomic structure and how it relates to an element's identity. 8.4 Formation of ions Combinations of atoms to form compounds Representation with chemical formulas 8.8 Different types of chemical bonds. Types of chemical reaction; reaction rates. 8.8, 8.9 Relation of total mass to a chemical reaction. 8.6 A chemical equation represents a chemical reaction Balance a chemical reaction Organization of periodic table Elements classified according to properties. 8.5 Properties of solutions differ from properties of original components. Solutions differ	converted from one form to another; efficiency of these processes. 9.2 -All the forms of energy can be described in terms of two general types of energy: kinetic and potential. -Energy changes in a chemical reaction. 9.6. -Calculate mechanic, kinetic, and potential energy. -Mirrors and lenses combine to make complex optical tools, used to extend natural vision. 9.8 -The eye depends on natural lenses, how artificial lenses can be used to correct vision problems. 9.8 -A material can refract light, lenses can change original images by bending light. 9.8 -Mirrors control reflection and produce images. 9.8 -Wave behavior of light affects what we see and how light waves interact with materials. 9.8, 9.9 -Visible light is produced, either by living things or artificially. 9.9 -EM waves are different from each other with different uses. 9.9 -Differences between electromagnetic (EM) waves and mechanical waves. -Uses of sound, from instruments to ultrasound to recordings.	related to velocity and calculation of acceleration. Describe forces and how unbalanced forces change an object's motion. 10.4 Newton's first law; predictions about motion. 10.5 Newton's second law; force, mass and acceleration. 10.4 Describe what type of force is required for circular motion. Relationship between action and reaction and how Newton's three laws work together. Momentum and explain its role in collisions. Mass and distance affect gravity and state that gravity keeps objects in orbit. 10.1 Friction affects motion; factors that affect friction. 10.5 Simple machines change the size or direction of a force. Force, work and power relation; how moving objects do work. Machine's efficiency Pressure; forces act on objects in fluids.			

								from mixtures; parts of a solution. Metallic alloys and their uses. Acids and bases; reaction with one another. Concentration of a solution; solubility; solubility is dependent on molecular structure.	-Basic properties of sound. Speed of sound waves. 9.7 -Sound waves are produced and detected and transfer energy. -Forces cause waves. Properties of a wave and relation to wave speed. -Classify, compare and contrast different types of waves. -Waves change as they interact with their environment or with other waves.	How power plants generate electrical energy; measuring electric power Generator converts energy; differences between different types of current. Magnets attract / repel. What makes materials magnetic; why a magnetic field surrounds the Earth. Electric current produces a magnetic field and vice versa; technological uses of electromagnets 10.2			
McREL Benchmarks for Grades 9-12													
	1.1 – 1.4	2.1-2.6	3.1-3.5	4.1-4.6	5.1-5.8	6.1-6.5	7.1-7.7	8.1-8.16	9.1-9.7	10.1-10.10	11.1-11.4	12.1-12.7	13.1-13.6
9								-Historical descriptions of the atom and their role in developing the modern concept of the atom. 8.1 -Characteristics of the 3 main subatomic particles. 8.1 -Modern theory of the atom 8.1 -Different types of atoms based on their composition 8.1 8.7 -Main features of the periodic table and describe its organization 8.2 -Different trends of the elements' characteristics in the periodic table. 8.2 -Electron configuration of atoms. 8.3 -Hydrogen bonding and its importance in determining the properties of	Define matter and energy and give examples of each.		Compare and contrast scientific knowledge and common knowledge using specific examples. 11.1	Use the scientific method to investigate a hypothesis. 12.1, 12.2 Distinguish between precision and accuracy in measuring and determine the correct unit of measurement. 12.4 Use scientific notation and significant figures correctly when solving problems.12.4 Use conversion factors to solve unit conversion problems. 12.4 Interpret the pH scale and describe the measurement of pH. 12.4 Summarize the historical	Demonstrate how scientific understanding influences technological advances and vice versa. 13.1, 13.4

								water. 8.4 -Describe and differentiate between various intramolecular interactions. 8.4, 8.6 -Structures of chemical compounds and their bonds. 8.4, 8.5 -Atomic number and mass number of atoms. 8.7 -Relationship between chemical change and chemical reaction -Identify the information included in a chemical equation. 8.11 8.12 -Different types of chemical reactions. -Balance chemical equations. 8.13 -Explain the mole and use it to solve unit conversion problems. 8.13 -Define the term "organic compound". 8.14 -Structural features of organic compounds. 8.14 -Composition and importance of petroleum on our planet. Contrast the different hydrocarbon families. 8.14 -Composition of plastics. 8.14 -Acids and bases and their importance in nature. 8.15 -pH scale and measurement of pH. 8.15 -Matter and energy and -Distinguish between physical and chemical changes				descriptions of the atom and their role in developing the modern concept of the atom. 12.5 Apply knowledge of the physical and chemical properties of matter to solve new problems.	

								-Different types of matter. 8.5 -Classify compounds, apply naming rules, and write their formulas. -Distinguish between the different types of chemical rxns.					
10				Historical events that lead to the discovery of the structure of the DNA molecule. 4.1 Genetic information is stored in DNA molecules, replication of DNA is vital for the continuity of living things. 4.1,4.3 Changes in the sequence of DNA result in changes to proteins and consequently result in variation amongst organisms 4.1-4 Model how genetic diversity is created within sex cells. 4.3 Predict the outcome of mating events and the genetic makeup of parents. 4.3-6 Ratios and inheritance probabilities for different types of genes. 4.3-6 Family histories for various genetic disorders 4.3-6 Processes and outcomes of	Structures and functions of prokaryotic and eukaryotic cells. 5.1,5.7 (and level V 5.3) Structures and functions of plant and animal cells. 5.1,5.3, 5.7 Cellular processes contribute to the functioning of the organism 5.2, 5.5 Use a microscope to analyze the differences in cellular organization between various types of organisms. 5.4 Analyze the activities of organ systems, and how they contribute to homeostasis 5.5,5.8 Identify stages of the cell cycle using microscope 5.6, Processes / outcomes of mitosis and meiosis. 4.5, 5.6 Knowledge of living systems and medical technology support disorder prevention /treatment 5.8	Relationships between organisms maintain stability within ecosystems .6.1 Life is specialized to take advantage of specific environmental conditions that reduce competition between species. 6.1 Energy and matter can limit the growth of a population 6.2 Energy flows and matter cycles within ecosystem. 6.3-4 Evaluate the assumptions and evidence for current approaches to modern environmental issues. 6.5	Major historical explanations for evolutionary change.7.1 Theory of natural selection explains the vast diversity of life on Earth 7.2-4 Evidence supporting theory of natural selection.7.6-7 Darwin's theory lays foundation for modern theory of evolution A century's worth of investigation has lead to refinements of his original theory. 7.4-7 Relationship between the theory of natural selection and the process of forming new species. 7.6-7				Evidence that exists for two alternate theories explaining the origin of cancer. 11.1-7 Darwin's theory laid the foundation for our modern theory of evolution, although over a century's worth of investigation has lead to refinements of his original theory. 11.3.4 Conduct investigations using variables to discover relationships between natural phenomena. 11.1-2 Criticize arguments that are based on faulty, incomplete or misleading use of numbers; compose arguments that are based on accurate and correct use of numbers. 11.1-2 Evaluate conclusions, being aware of the many variables involved in experiments 11.1-2 Communicate the relevance of student-led	Use a microscope to analyze the differences in cellular organization between various types of organisms. 12.4 Identify stages of the cell cycle using a microscope. 12.4 Evidence exists for two alternate theories for origin of cancer. 12.3, 12.5, 12.7 Conduct investigations using variables to discover relationships between natural phenomena. 12.1-7 Criticize arguments that are based on faulty, incomplete or misleading use of numbers; compose arguments that are based on accurate and correct use of numbers. 12.2-4 Evaluate conclusions, being aware of the many variables involved in experimentation 12.2-4 Communicate the relevance of	Illustrate how Science and Technology can both solve and create problems.13.1,13.4 Construct and refine persuasive arguments about issues in Science and Technology after listening/reading the opinions of their peers and community.13.3-4 Assumptions and evidence for current approaches to modern environmental issues. 13.3-4 Evidence that exists for two alternate theories explaining the origin of cancer. 13.3 Historical events that lead to the discovery of the structure of the DNA molecule. 13.5 Human understanding of DNA has lead to numerous technological innovations. 13.3-5 Positive and negative

				mitosis and meiosis. 4.5 Chromosome staining charts to explain the significance of chromosome number in body cells and sex cells. 4.6	Relationship between structure and function of cells/tissues and organs they build. 5.8 Structure of a neuron can be modified depending on its function within the nervous system.5.8 Nervous system response to internal / external stimuli.5.8						scientific investigations to the school community. 11.1, 11.2, 11.6	student-led scientific investigations to the school community 12.1-7	consequences resulting from the introduction of genetic technologies. 13.3-5 Darwin's theory laid the foundation for our modern theory of evolution, although over a century's worth of investigation has lead to refinements of his original theory. 13.5 Investigations using variables to discover relationships between natural phenomena. 13.6 Relevance of student-led scientific investigations to the school community.13.2-6
11								-Arrangement of the Periodic Table. 8.2 -Shapes of molecules and charged groups of atoms. 8.3 -Carbon's ability to form covalent bonds in terms of its atomic structure and orbitals. 8.4, 8.14 -Why molecules have different shapes. 8.5 -Four different intermolecular forces. 8.5 -Properties of combinations of different substances. 8.5 -Why nuclear reactions occur, and write equations for them. 8.7	Why nuclear reactions occur, and write equations for them. 9.5			Technological devices collect and record experimental data. 12.4 Perform unit conversions12.4 Models which represent chemistry concepts.12.7 Describe or explain chemical phenomena 12.7 Graphic organizers to report experimental results.12.7 Distinguish theoretical yield and actual yield.	Use information resources to investigate interdisciplinary connections. 13.2, 13.5 -

								-Molecular model using recycled materials. 8.5, 8.14 -Factors that affect the stability of a nucleus. 8.8 -Predict whether a given reaction will occur and the products 8.10 -Calculate the amount of heat absorbed by water. 8.10 -Chemicals that limits the amount of products in a chemical change. 8.12 -Percent yield of a reaction. 8.13 -Different forms of carbon found in nature and their properties. 8.8, 8.14 -Different organic compounds. 8.14 -Naming and writing formulas of organic compounds. 8.14 -How structures affect the uses of specific organic compounds .8.14 -Describe and distinguish different types of reactions involving organic compounds. 8.14 -Explain why certain solutions are capable of conducting electric current. 8.15 -Write equations to show how compounds containing ions dissolve in water. 8.15 -Predict whether a solid will form in a chemical change. 8.15 -Dissolving process of different types of compounds in water. 8.17					

								-Temp and pressure affect the solubility of a substance in water. 8.17 -Properties of aqueous solutions. 8.17 -Graphs related to the properties of aqueous solutions. 8.17 -Behavior of gases according to kinetic molecular theory. V- 8.3 -Pressure and force. V-8.3 -Pressure unit conversions to solve word problems. V-8.3 -Gas laws to differentiate between changes in volume, pressure and temperature of gases. V- 8.3 -Calculate the molar mass of a gas. V-8.3 -Physical properties of water. -Classify a chemical reaction as one or more of the eight different types. -Determine and compare the simplest formula and the actual formula of a given compound. -Relationship between matter and change.					
12									Entropy and consequences of the fact that it tends to increase over time. 9.1 Different types of energy. 9.2 Relationship between heat and temp. 9.3 Rules which	-Relationship between electric forces and magnetic forces in modern technologies such as electric motors, radios or televisions. 10.1 --Magnitude and direction of the force of gravity on earth and elsewhere.10.3	Use information resources to investigate historical or recent information about discoveries in physics.11.3, 11.4	Graphs and other multimedia formats to demonstrate understanding of physical phenomena or to display the results of experiments. 12.4 Computer simulations to investigate	Basic tools and materials to create devices which effectively employ or demonstrate the laws of physics. 13.6 Physical phenomena

									govern the phenomenon of heat transfer and application to working systems. 9.3 Characteristics of all waves9.6 Behavior of interacting waves. 9.6 Sound as a wave and its behavior in terms of wave properties. 9.6 Wave nature of matter and the basics of particle physics in terms of wave properties. 9.6 Wave nature of light, and its behavior in terms of wave properties. 9.7 Quantitative and qualitative characteristics of a wave 9.7 Concept of energy in solving classical mechanics problems Energy as the ability to do work, and calculate the amount of energy used or required in a given event. Predict images created by lenses and mirrors.	--Forces caused by charged particles. 10.4 --Magnetic properties in terms of atomic phenomena. 10.5 --Electric current and properties of an electric circuit or device. 10.6 --Behavior of electrically charged particles. 10.7 --Vectors as quantities having both magnitude and direction, and add two vectors together. 10.8 --Displacement, velocity, and acceleration.10.8 --Displacement, velocity and acceleration graphs to determine the characteristics of an object's motion over time. 10.8 --Projectile's motion follows the shape of a parabola. 10.8 --How an object moves when no forces are applied to it, and when multiple forces are applied to it.10.8 --All forces occur in action-reaction pairs and predict all consequences of an applied force. 10.8 --Circular motion requires the application of a constant force directed toward the center of the circle. 10.8 --Mathematically analyze circular motion. 10.8 --Quantitative and qualitative characteristics of a wave, relationship between		physical phenomena. 12.5	

										characteristics, and resulting waves 10.9 --Wave nature of light, and its behavior in terms of wave properties. 10.9 --Special relativity as a theory of space-time with several consequences such as the equivalence of energy and matter. 10.10			

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