KEY LEARNINGS: SCIENCE 2009-2011

KINDERGARTEN

Life: Worms, Insects, Spiders

- Recognize characteristics that are similar and different between organisms
- Describe the basic needs of living things
- Describe how related animals have similar characteristics
- Identify how animals gather and store food, defend themselves, find shelter and adapt
- Understand the beneficial effects of earthworms
- Explain how insects are both harmful and helpful
- Know the dangers of poisonous spiders

Health: Home/School Safety

- Identify common hazards and practice safety rules
- Demonstrate appropriate work and play behaviors

Physical: Simple Measurement, Observation, Light/Colors

- Perform simple comparative measurements
- Describe objects according to their physical properties e.g. color, texture, size
- Describe various sources of light
- Identify sunlight as a composite of all colors
- Identify primary colors
- Describe the composition of secondary colors
- Identify the fixed order of color as found in a rainbow

Earth: Air, Land, Water, Ecology, Seasons

- Describe air as a substance that takes up space and moves around us
- Recognize that the Earth is made up of land, water and the gases of the atmosphere
- Recognize and describe appropriate ways to care for our Earth
- Identify God's role in the creation of the Universe
- Understand how Earth's position in relation to the sun accounts for days, seasons and years
- Identify seasonal changes in weather patterns

Scientific Inquiry: May be included in each unit of study

- Make observations
- Ask questions or form hypotheses based on these observations
- Plan a simple investigation
- Collect data from the investigation
- Use the data collected from the investigation to explain the results
- Safely use and store tools and equipment

Service and Career Options

- Explore ways to use Physical, Life, Health, and/or Earth Science to serve the community
- Identify careers in areas of science

FIRST GRADE

Life: Living Things

- Describe the life cycle of animals
- Describe characteristics of amphibians, reptiles, birds and fish
- Describe traits common to all animals

Health: Mental, Emotional, and Family Health

- Identify important personal values
- Understand the importance of making appropriate decisions based on personal values
- Understand that God's love is unconditional
- Identify emotions and share feelings in appropriate ways
- Use habits and practices that affect family health
- Explain God's plan for family units

Physical: Heat, Energy/Waves, Sound, Light
- Define heat and how it affects matter
- Define conduction and convection
- Define energy and a wave
- Describe the features of waves
- Explain how sound is produced
- Analyze how sound travels
- Identify the speed of light
- Explain how light absorption affects the color of objects
- Explain how a laser works
- Describe how a sound wave is different from a light wave

Earth: Meteorology (Weather Elements, Climate, Seasons, Atmosphere, Water Cycle)
- Define meteorology, basic weather symbols and instruments
- Identify elements of weather
- Explain how land forms and large bodies of water affect climate
- Explain the change of seasons
- Describe the water cycle including precipitation, condensation, and cloud formation
- Show examples of the earth's atmosphere
- Understand God as the Creator and Sustainer of the Universe

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SECOND GRADE

Life: Human Body
- Describe the basic needs of living things
- Understand the function of the five senses
- Recognize the organization of the body's systems and organs

Health: Human Body (Digestion, Excretory), Nutrition, Safety/First Aid
- Identify the organs of the digestive system and the digestion process
- Explain the importance of the excretory system
- Describe healthy dietary guidelines
- Categorize foods in the Food Pyramid
- Explain how the body utilizes nutrients
- Explain how proper nutrition is related to good health
- Identify appropriate first-aid procedures for minor injuries and emergencies
- Identify appropriate safety procedures to prepare and respond to disasters
- Identify safe practices at home, school, and play

Physical: Magnetism, Electricity
- Describe properties and force of magnets
- Define electricity and electrical fields
- Identify the basic nature of current and static electricity

Earth: Geology
- Describe the surface features of the earth
- Identify evidences of the flood
- Explain how earthquakes are caused

- Explain how volcanoes form
- Distinguish between rocks and minerals
- Define erosion
- Describe soil pollution

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THIRD GRADE

Life: Animals, Arthropods, Arachnids, Genetics

- Describe the basic needs of living things
- Describe the life cycle of animals
- Identify factors that all animals need to survive
- Explain food chains and food webs and identify producers and consumers in an ecosystem
- Classify organisms according to characteristics that are similar and different
- Identify inherited traits and diseases

Health: Drugs, Health Principles, Biblical Principles, Natural Laws, Human Sexuality

- Understand drug abuse is harmful to health
- Identify healthful and harmful drugs and their affects
- Understand the proper use and value of medicines
- Understand that God has provided guidelines (natural laws) to keep us healthy
- Exhibit life style choices consistent with Biblical principles

Physical: Force, Friction/Gravity/Inertia, Motion

- Define force and friction and explain how they affect movement
- Define gravity and describe how it affects matter
- Compare the gravitational attraction of objects of varying mass
- Define inertia and describe its effects
- Describe how forces affect the motion of objects

Earth: Origin of the Universe, Astronomy, Solar System

- Identify God's role in the creation of the universe
- Understand the purpose of God's law and order in the universe
- Define astronomy
- Describe the space program
- Identify the members of the Solar System
- Describe the sun's affect on planet earth
- Describe the moon's phases
- Define asteroids, meteors, comets, and constellations

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FOURTH GRADE

Life: Plants
- Group and classify plants based on common characteristics
- Identify conditions necessary for plant survival and growth
- Describe the steps of photosynthesis and sequence them
- Describe the life cycle of a plant including the process of pollination
- Describe basic plant structures and systems identifying their functions e.g. seed, root, stem, leaf
- Understand ecosystems and communities and how plants adapt to survive

Health: Consumer Health, Community Health, Disease
- Explain how personal habits affect health
- Develop an awareness of physical and mentally challenged persons
- Identify sources of diseases and how they may be prevented
- Identify important community health care workers and resources

Physical: Chemistry Matter, Atomic Structure, Energy/Work
- Understand matter classification by properties
- Identify and compare physical and chemical change
- Explain the structure of atoms and how they are the building blocks of matter
- Identify chemistry mixtures and compounds
- Define potential and kinetic energy
- Define and understand simple and compound machines

Earth: Creation/Evolution, Geology, Ecology
- Explain why the story of the flood is important to creation
- Define fossil
- Identify fossil fuels formed at the time of the flood
- Identify examples of common dinosaurs
- Understand the importance of fossils in interpreting Earth's history
- Define habitat, biomes, and environment
- Describe a food chain
- Identify and describe characteristics of animal communities
- Distinguish between renewable and nonrenewable resources
- Identify resources found in various environments
- Identify Earth's basic natural resources found and the wise use of these resources

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FIFTH GRADE

Life: Living Things
- Describe, explain and compare the structure and function of cells
- Identify the characteristics of living things and non-living things
- Use the standard classification system to group animals based on their characteristics
- Identify features of fish that distinguish them from other classes of animals

- Identify the main characteristics of birds, reptiles, amphibians, and mammals and how these characteristics affect the behavior and function of the animal
- Compare the different behaviors of animals e.g., innate, learned, cyclic, social

Health: Personal Mental Health, Interpersonal Human Health, Human Sexuality

- Describe how personality, relationships and self-concept affect mental and emotional health
- Define stress including its positive and negative aspects and how stress relates to decision making
- Identify factors that influence how friends are chosen and the impact of friends on peer pressure
- Know ways to seek assistance if worried, abused or threatened
- Explain human reproduction and development
- Identify the physical, emotional, intellectual and social changes that occur at puberty
- Describe God's plan for human sexual behavior

Physical: Heat, Energy Waves, Sound, Light

- Describe the relationship between heat and the kinetic theory of matter
- Identify, describe, and compare different types of wave energy including electromagnetic and mechanical
- Describe the organization of the electromagnetic spectrum and the uses/applications of each type of electromagnetic wave
- Compare electromagnetic (heat, light, radio) waves and mechanical (sound, water) waves
- Explore characteristics of heat, sound and light (including color)
- Compare the function of simple optical devices

Earth: Meteorology, Oceanography

- Define meteorology, and the purpose of various weather instruments
- Describe how clouds are formed
- Identify characteristics of different storms
- Distinguish between climate and weather and identify factors that affect climate
- Describe Earth's atmospheric layers and the "greenhouse" effect
- Explain air pressure and local/global winds, how they are measured and their effects on weather
- Explain the water cycle and its relationship to weather and climatic patterns
- Describe the physical structures of and ecosystems present in the ocean
- Explain currents, tides, ocean waves and ocean water composition
- Identify resources available from the sea and how humans affect the ocean ecology

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SIXTH GRADE

Life: Cells, Human Body

- Describe and explain the structure and functions of the human body in terms of cells, tissues and organs
- Identify and describe the development and function of the cell and its parts
- Identify common characteristics of cells
- Explain the function of the nucleus
- Distinguish between chromosomes, genes, DNA, and their structure
- Identify the major skeletal, muscular, and integumentary systems
- Identify the parts and function of the respiratory, circulatory, and nervous systems

- Describe differences among atoms, elements, molecules, and compounds
- Understand the function of the five senses

Health: Human Body (Digestion, Excretory), Nutrition, Safety/First Aid, Natural Disasters

- Identify and describe the parts of the digestive system
- Identify and explain the importance of the excretory system
- Identify and describe the importance of basic nutrients
- Explain healthy eating practices based on the national food pyramid
- Identify nutritional goals based on national dietary guidelines
- Define eating disorders and explain how they adversely affect health
- Explain the appropriate first aid procedures to follow in case of emergencies
- Identify common safety hazards and ways to prevent injuries/accidents
- Identify safety procedures for common natural disasters

Physical: Magnetism, Electricity

- Identify characteristics of magnets and what causes magnetism
- Describe the relationship between electricity and magnetism
- Identify uses of electromagnets
- Compare and describe static and current electricity
- Identify the difference between conductors and insulators.
- Describe electrical safety precautions, conservation procedures, and simple electrical transformation devices
- Identify and explain types of circuits, batteries, and simple electronic devices

Earth: Geology

- Describe Earth's structure and features
- Explain how Earth has changed over time e.g. erosion, weathering, earthquakes
- Explore and interpret evidences for the Genesis Flood and the Ice Age
- Describe how earthquakes are caused, volcanoes are formed, and land features created through the use of plate tectonics
- Describe the processes by which rocks and soils are formed and their relation to the rock cycle
- Identify common rocks and minerals
- Identify and describe features of erosion and weathering

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SEVENTH GRADE

Life: Simple Animals, Arthropods, Monerans, Protista, Fungi, Viruses, Genetics

- Distinguish between vertebrates and invertebrates
- Identify characteristics and structures of sponges and cnidarians, worms, mollusks, echinoderms, crustaceans, proticsts, fungi and viruses
- Describe the main groups of bacteria
- Explain how bacteria reproduce and conditions that influence bacterial growth
- Describe how the bodies immune system reacts to viruses and bacteria
- Explain the importance of the nucleus
- Explain genetic engineering
- Explain the difference between heredity and genetics

Health: Drugs, Human Sexuality

- Define and identify helpful and harmful drugs
- Explain the physical and emotional consequences of drug use
- Describe the steps in decision making, how values develop, and how these apply to healthy choices
- Explain the physical, emotional, intellectual, and social changes occurring at puberty
- Describe God's plan for human sexual relationships
- Explain the adverse physical, emotional, and economic consequences of premarital sex and ways to support a decision for abstinence

Physical: Force/Motion, Energy/ Work

- Describe and compare types of force and friction
- Define and apply understanding of gravity, mass and weight
- Define and describe elastic/nuclear forces and electrical/magnetic force
- Explain and describe types of friction
- Describe Newton's laws of motion
- Define and use correctly the terms of motion (velocity, speed, acceleration, momentum, etc.)

Earth: Origin of the Universe, Astronomy

- Compare the Biblical account of creation with the big-bang theory
- Explain how the study of astronomy supports the concept of a Creator
- Describe the major accomplishments in the U.S. space program
- Know how the Earth's position, relative to the sun, affects conditions on earth
- Describe the life cycle and classification of stars and the instruments for study
- Compare and contrast the main types of galaxies

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EIGHTH GRADE

Life: Plants

- Compare types of plant kingdom divisions in their structure and function
- Describe photosynthesis, cell respiration, transportation, and transpiration
- Describe plant reproduction
- Describe types of plant tropisms and how plants adapt to their environment

Health: Consumer Health, Community Health, Teen Health Risks, Diseases

- Know how to locate and use community health resources that provide valid health information
- Identify community health organizations and agencies such as The American Cancer Society and the advocacy services they provide
- Identify major risks to teen health and how these risks may be reduced
- Describe how life style pathogens, family history, and other risk factors are related to the cause or prevention of disease
- Identify the structure and function of bacteria and viruses; explain how they transmit diseases
- Describe personal and community health care practices that result in prevention, detection and treatment of communicable diseases
- Explain how the immune system protects the body from disease

Physical: Chemistry, Energy Forms, Work and Machines

- Identify characteristics of a simple physical and chemical changes
- Describe the relationship between atoms, elements, molecules, ions, and isotopes

- Identify symbols of common elements and describe how they are organized on the periodic table
- Distinguish between compounds, mixtures, and types of mixtures
- Explain a chemical reaction and chemical bonds
- Identify the make-up of the three types of radiation
- Describe how nuclear fission and fusion are produced and their associated dangers and benefits
- Compare the properties of acids and bases
- Explain how energy can change from one form to another
- Describe the relationship between simple and compound machines
- Explain the operation of a simple mechanical device and its relation to work and power

Earth: Creation, Evolution, Earth's Age, Fossil Record, Ecology

- Distinguish between the basic ideas of and evidence for naturalistic evolution and special creation
- Identify several theories of origins and their basic assumptions
- Explain why "The Story of the Flood" is important to creation
- Describe Darwin's basic idea and assumptions of naturalistic evolution
- Describe the three views on the age of the earth
- Compare the naturalistic interpretation of fossils with that of creationist interpretation
- Analyze the impacts of human activity on the ecosystems of the earth
- Identify ways in which organisms react to changing environments
- Describe methods of conserving natural resources
- Identify factors that cause species to become endangered or extinct

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- Identify careers in areas of science