

## **GRADE 5        SCIENCE**

The science curriculum for grade five encourages students to develop an appreciation and understanding for various scientific concepts through a systematic approach: lecture, observation and hands on experiences. Hopefully, this program of study will encourage students to begin to view the world like a scientist does: asking questions, creating hypotheses, seeking answers, collecting data, measuring, making observations, discussing findings etc. By studying these topics, students will gain the building blocks for deeper understanding, that will prove to be helpful at a later time.

### **Classifying Living Things**

Students will:

- describe kingdom and species
- identify the five large groups (kingdoms) that scientists have divided all living things into: Plant, Animal, Fungus, Protist, and Moneran
- identify and become familiar with each of the smaller groups that the kingdoms are divided into: Kingdom, Phylum, Class, Order, Family, Genus, and Species
- identify the five different classes and major characteristics of vertebrates
- identify the six different classes and major characteristics of invertebrates
- summarize the functions of animal systems
- describe how the skeletal system and the muscular system work together to produce movement

### **Cells: Structures and Processes**

Students will:

- learn that all living things are made up of cells, the building blocks of life
- identify and describe the differences between a plant and animal cell
- become familiar with and be able to describe the functions of the plant and animal cell's structures (cell wall, cell membrane, cytoplasm, vacuole, mitochondrion, chloroplast, nucleus, nuclear membrane, chromatin)

### **Plant Structures and Processes**

Students will:

- describe the differences between vascular and non vascular plants regarding parts and functions
- learn about the important process of photosynthesis that occurs in plant cells in order for plants to make their own food
- learn about the process of photosynthesis that involves sunlight, chlorophyll, carbon dioxide, water, xylem, phloem, stomata, oxygen, and sugar (glucose)
- differentiate between asexual reproduction (vegetative- runners, bulbs, and cuttings) and sexual reproduction (spore-bearing plants (ferns), non-flowering seed plants (conifers), and flowering plants)

- learn about and understand the many details of the different steps in the plant-seed cycle that aids in seed and fruit production (germination, pollination, fertilization, and seed dispersal)
- distinguish the similarities and differences between monocot and dicot seeds (number of cotyledons (embryo), stored food (endosperm), and seed coat)

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### **Ecosystems**

Students will:

- explain ecosystems, communities, and populations
- describe how food chains, food webs, and energy pyramids work
- explain how populations compete and are limited by the resources they need
- define habitat, niche, symbiosis, commensalisms, mutualism, and parasitism
- explain structural and behavioral adaptations
- describe plant and animal adaptations including camouflage and mimicry
- study in depth the tidepool ecosystem and visit one as a class

### **Life Cycles and Reproduction**

Students will:

- gain an understanding of the life cycle: development of an organism from birth to growth, reproduction (asexually or sexually), and death
- learn that all living things reproduce themselves when special male and female cells join to form a fertilized egg

### **The Human Body: Endocrine System**

Students will:

- watch a video and discuss, with the school nurse, the changes that occur during puberty, as well as the reproductive organs involved in the process
- learn that the human body has two types of glands: ductless and duct
- focus their study on the endocrine system, where glands release hormones into the bloodstream which help to control different body processes
- describe the glands' basic functions (pituitary, thyroid, parathyroid, adrenal, pancreas, ovaries, testes)

### **Earth Science**

**Students will:**

- classify Earth's physical features including landforms and features of the ocean floor
- define the Earth's layers
- discuss how the theory of plate tectonics explains continental drift
- define Earth's layers
- describe weathering
- discuss the relationship between erosion and deposition
- define how Earth's shape and tilt affect temperature and winds
- explain how global and local winds form

- explain how clouds and precipitation form
- summarize how air masses and fronts affect weather
- explain how severe storms form
- explain what determines an area's climate
- summarize the factors that affect climate

### **Physical Science: Matter and Change**

Students will:

- learn that electrically charged particles come together to make atoms; atoms come together to make molecules; molecules create elements, and elements create matter
- memorize some well known elements and their symbols
- read the periodic table of elements, a chart that organizes elements with common properties, atomic symbols, and atomic number
- learn that the periodic table of elements is divided into three categories of elements: metals, nonmetals, and metalloids
- realize that atoms are constantly in motion because electrons are always in motion, even in solids, liquids, and gasses
- learn that some atoms combine with others to create compounds
- distinguish between chemical and physical changes of substances
- describe matter and the three states of matter: solid, liquid, and gas
- measure and calculate density
- explain the structure of matter, elements and atoms
- describe the properties of metals, nonmetals and metalloids
- determine whether an element is metal, nonmetal or metalloid
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### **Physical Science: Forces and Energy**

- understand the relationship between position, motion, velocity, and acceleration
- calculate velocity and acceleration
- learn about balanced and unbalance forces
- understand how gravity and friction affect motion
- learn how to apply Newton's three laws of motion
- define work and energy
- identify the six types of simple machines

### **Science Biographies**

Students will:

- become familiar with the scientists: Galileo, Newton, Carl Linnaeus and others throughout their studies
- gain a deeper understanding and respect for scientists by researching a scientist of their choice and presenting it to the class

## **Materials**

**Student's main text is Science a Closer Look by Macmillan / McGraw-Hill**

**Science A Closer Look Transparencies and Visual Literacy**

**Science A Closer Look Assessments**

**Science A Closer Look Vocabulary Cards**

- Student packets created from a variety of teacher resources
- Teacher made notes, graphic organizers, worksheets, tests, quizzes, study guides, and games
- Arts and crafts materials for various projects related to each topic of study
- A variety of books for the classroom library to enhance the topics covered in the curriculum
- Videos from United Streaming
- Videos from our school library:
  - Marie Curie
  - Thomas Edison
  - Einstein
  - Galileo
  - The Wright Brothers
  - All About Solids, Liquids, & Gases
  - Atoms & Molecules
  - The Periodic Table
  - Cells
  - The Phenomenon of Sound
  - Sound
  - Sight
  - Classification of Living Things
  - Genes & Heredity
  - All About Caring for Plants
  - All About Endangered & Extinct Animals
  - Totally Reptile!: Crocs, Snakes, Frogs, & Lizards
  - All About Fish
  - Fish
  - All About Amphibians
  - Amphibian
  - All About Reptiles
  - Reptile
  - All about Birds
  - All About Mammals
  - All About the Brain
  - All About the Senses

**Instruction**

The teacher will:

- lead class lectures and discussions
- conduct mini experiments
- assign independent reading and assignments based on class lecture and discussion
- assign independent or cooperative group projects to be completed in class
- read additional books to the class to enhance the concepts learned
- show videos to enhance the concepts learned
- facilitate games created for each unit of study

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