CROSSINGS CHRISTIAN SCHOOL

Seventh Grade Science

Science Course Outline

Unit & Content Objectives	*Time*	*Activities & Methods*	*Books & Materials*	*Evaluation Techniques*
Safety, Metrics, & Scientific Method • Students will explain the steps in the scientific method • Students will demonstrate science safety rules during lab group experiences • Students will explain the importance of the International System of Units and calculate changes in the metric scale • Students will be able to identify three types of variables in experimental design • Students will record and classify observations • Students will design data tables and collect data • Students will construct bar and line graphs and analyze data • Students will draw conclusions and communicate results orally and in written reports	3 Weeks 5 days/wk 45 min/day	• Metric Mania • Lab - Big Splash • Lab - Designing an Investigation	• Textbook • Workbooks • Brainpop	• Homework • Labs • Unit Exam

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Characteristics of Living Things & Cells • Students will describe the six characteristics of living things • Students will describe how organisms maintain stable internal conditions • Students will explain how asexual reproduction differs from sexual reproduction • Students will describe the chemical building blocks of life • Students will state the parts of the cell theory • Students will describe the parts of a cell and their functions and explain why cells are so small • Students will explain the difference between prokaryotic and eukaryotic cells	3 Weeks 5 days/wk 45 min/day	• Lab - Response to Stimuli • Lab - Cell Size • Cell Analogy Group Project	• Textbook • Workbooks • Brainpop	• Homework • Labs • Unit Exam

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The Cell in Action • Students will explain the process of diffusion • Students will describe how osmosis occurs • Students will compare passive and active transports • Students will explain how large particles get into and out of cells • Students will describe photosynthesis and cellular respiration • Students will compare cellular respiration with fermentation • Students will explain how cells produce more cells • Students describe the process of mitosis • Students will explain how cell division differs in animals and plants	2 Weeks 5 days/wk 45 min/day	• Lab - Gummy Bear Osmosis • Photosynthesis & Cellular Respiration Project • Lab - Modeling Mitosis	• Textbook • Workbooks • Brainpop	• Homework • Labs • Unit Exam

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Heredity & DNA • Students will explain relationships between traits and heredity • Students will describe the experiments of Gregor Mendel • Students will explain the difference between dominant and recessive traits • Students will explain how genes and alleles are related to genotype and phenotype • Students will use the information in a punnett square • Students will describe three exceptions to Mendel's observations • Students will explain how probability can be used to predict possible genotypes in offspring • Students will explain the difference between mitosis and meiosis • Students will describe how chromosomes determine sex • Students will explain why sex-linked disorders occur in one sex more often than the other • Students will interpret a pedigree • Students will list 3 important events that led to understanding the structure of DNA • Students will describe the basic structure of DNA • Students will explain how DNA molecules can be copied • Students will explain the relationship between DNA, genes, and proteins • Students will outline the basic steps in making a protein • Students will describe three types of mutations, and provide an example of a gene mutation	2 Weeks 5 days/wk 45 min/day	• Genetic Scavenger Hunt • Lab - Bean Genes	• Textbook • Workbooks • Brainpop	• Homework • Labs • Unit Exam

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Classification • Students will explain why and how organisms are classified • Students will list the eight levels of classification • Students will explain scientific names • Students will describe how dichotomous keys help in identifying organisms • Students will explain how classification developed as greater numbers of organisms became known • Students will describe the three domains • Students will describe the four kingdoms in the domain Eukarya	2 Weeks 5 days/wk 45 min/day	• Activity - Using a Dichotomous Key • Activity - Shark Dichotomous Key • Activity - Making a Dichotomous Key • Kingdoms Brochure	• Textbook • Workbooks • Brainpop	• Homework • Labs • Unit Exam

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Bacteria & Viruses • Students will describe the characteristics of prokaryotes • Students will explain how prokaryotes reproduce • Students will relate the characteristics of archaea • Students will explain how life on earth depends on bacteria • Students will list three ways bacteria are useful to people • Students will describe two ways in which bacteria can be harmful to people • Students will explain how viruses are similar to and different from living things • Students will list the four major virus shapes • Students will describe the two kinds of viral reproduction	2 Weeks 5 days/wk 45 min/day	• Lab - Spying on Spirilla • Wet Mount Lab • Activity - Modeling Bacterial and Viral Reproduction • Research A Virus	• Textbook • Workbooks • Brainpop	• Homework • Labs • Unit Exam

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Protists, Fungi, & Plants • Students will describe the characteristics of protists • Students will describe four ways that protists get food • Students will describe three ways that protists reproduce • Students will describe how protists can be organized into three groups based on their shared traits • Students will describe the characteristics of fungi • Students will distinguish between the four main groups of fungi • Students will explain how lichens affect their environment • Students will identify four characteristics that all plants share • Students will describe the four main groups of plants • Students will explain how seedless plants are important to the environment • Students will describe the relationships between seedless vascular plants and coal	3 Weeks 5 days/wk 45 min/day	• Lab - Slime Mold • Lab - Moldy Bread • Lab - Mushroom Dissection • Lab - Baby Powder Cuticle • Lab - Plant growth • Lab - Flower Dissection	• Textbook • Workbooks • Brainpop	• Homework • Labs • Unit Exam

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Invertebrates • Students will describe the body parts, nervous systems, and guts of invertebrates • Students will explain how sponges get food • Students will describe three cnidarian characteristics • Students will describe the three types of flatworms • Students will describe the body of a roundworm • Students will explain how mollusks eat, control body functions, and circulate blood • Students will describe the four body parts that most mollusks have • Students will describe the three kinds of annelid worms • Students will list the four main characteristics of arthropods • Students will describe the different body parts of the four types of arthropods • Students will describe the two types of metamorphosis in insects • Students will describe the endoskeleton, nervous system, and water vascular system of echinoderms • Students will explain how and echinoderm's body symmetry changes with age • • Students will describe five classes of echinoderms	2 Weeks 5 days/wk 45 min/day	• Activity - Create a Cnidarian • Lab - Earthworm Dissection • Lab - Clam Dissection • Lab - Crawfish Dissection • Lab - Starfish Dissection	• Textbook • Workbooks • Brainpop	• Homework • Labs • Unit Exam

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Vertebrates • Students will list the four common body parts of chordates • Students will describe the two main characteristics of vertebrates • Students will explain the difference between an ectotherm and an endotherm • Students will describe four characteristics that fishes share • Students will describe the three classes of living fishes, and give an example of each • Students will explain how amphibians breathe • Students will describe amphibian metamorphosis • Students will describe the three groups of amphibians, and give an example of each • Students will explain why amphibians are ecological indicators • Students will explain the characteristics that allow reptiles to live on land • Students will describe the characteristics of an amniotic egg • Students will name the four groups of modern reptiles and give an example of each • Students will describe two kinds of feathers • Students will describe how a bird's diet, breathing, muscles, and skeleton help it fly • Students will explain how lift works • Students will describe how birds raise their young • Students will identify the differences between flightless birds, water birds, perching birds, and birds of prey • Students will explain how early mammals lived • Students will describe seven common characteristics of mammals • Students will explain how placental mammals develop • Students will give an example of each type of placental mammal	3 Weeks 5 days/wk 45 min/day	• Lab - Perch Dissection • Lab - Floating a Fish Pipe • Lab - Frog Dissection • Vertebrate Glogster Project	• Textbook • Workbooks • Brainpop	• Homework • Labs • Unit Exam

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Ecology • Students will distinguish between the biotic and abiotic parts of the environment • Students will explain how populations and communities are related • Students will describe how the abiotic parts of the environment affect ecosystems • Students will describe the functions of producers, consumers, and decomposers in an ecosystem • Students will explain how energy flows through a food web • Students will describe how the removal of one species affects the entire food web • Students will explain the relationship between carrying capacity and limiting factors • Students will describe the two types of competition • Students will distinguish between mutualism, commensalism, and parasitism • Students will diagram the water cycle, and explain its importance to living things • Students will diagram the carbon cycle, and explain its importance to living things • Students will diagram the nitrogen cycle, and explain its importance to living things • Students will describe the process of succession • Students will contrast primary and secondary succession • Students will explain how lift works • Students will describe how birds raise their young • Students will explain how mature communities develop	3 Weeks 5 days/wk 45 min/day	• Lab - Capturing the Wild Bean • Lab - Journey through the Water Cycle • Exploring the Carbon Cycle Poster • Lab - Exploring the Nitrogen Cycle • Lab - Exploring the steps of the water, carbon, and nitrogen cycles • Activity - Types of Succession	• Textbook • Workbooks • Brainpop	• Homework • Labs • Unit Exam

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Body Organization & Structure • Students will describe how tissues, organs, and organ systems are related • Students will list 11 organ systems • Students will identify how organ systems work together to maintain homeostasis • Students will identify the major organs of the skeletal system • Students will describe four classes of bones • Students will describe three joints • Students will list three injuries and two diseases that affect bones and joints • Students will list three kinds of muscle tissue • Students will describe how skeletal muscles move bones • Students will compare aerobic exercise with resistance exercise • Students will describe two muscular injuries • Students will list four functions of skin • Students will describe the two layers of skin • Students will describe the structure and function of hair and nails • Students will describe two kinds of damage that can affect skin	3 Weeks 5 days/wk 45 min/day	• Lab - Perch Dissection • Lab - Floating a Fish Pipe • Lab - Frog Dissection • Vertebrate Glogster Project	• Textbook • Workbooks • Brainpop	• Homework • Labs • Unit Exam

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Circulation, Respiration, and Urinary System • Students will list five main parts of the cardiovascular system, and describe their function • Students will describe the two types of circulation of blood in the body • Students will list four cardiovascular problems • Students will identify the four main components of blood • Students will describe three functions of blood • Students will explain how blood pressure is measured • Students will explain what the ABO blood types are and why they are important • Students will describe the relationship between the lymphatic system and the cardiovascular system • Students will identify six parts of the lymphatic system, and describe their functions • Students will describe the parts of the respiratory system and their functions • Students will explain how breathing happens • Students will discuss the relationship between the respiratory system and the cardiovascular system • Students will identify two respiratory disorders • Students will describe the parts and functions of the urinary system • Students will explain how the kidneys filter blood • Students will describe three disorders of the urinary system	3 Weeks 5 days/wk 45 min/day	• Lab - Capturing the Wild Bean • Lab - Journey through the Water Cycle • Exploring the Carbon Cycle Poster • Lab - Exploring the Nitrogen Cycle • Lab - Exploring the steps of the water, carbon, and nitrogen cycles • Activity - Types of Succession	• Textbook • Workbooks • Brainpop	• Homework • Labs • Unit Exam

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Communication & Control • Students will describe the relationship between the central nervous system and the peripheral nervous system • Students will compare the somatic nervous system with the autonomic nervous system • Students will list one function of each part of the brain • Students will list four sensations that are detected by receptors in the skin • Students will describe how a feedback mechanism • Students will explain how blood pressure is measured • Students will explain what the ABO blood types are and why they are important • Students will describe the relationship between the lymphatic system and the cardiovascular system • Students will identify six parts of the lymphatic system, and describe their functions • Students will describe the parts of the respiratory system and their functions • Students will explain how breathing happens • Students will discuss the relationship between the respiratory system and the cardiovascular system • Students will identify two respiratory disorders • Students will describe the parts and functions of the urinary system • Students will explain how the kidneys filter blood • Students will describe three disorders of the urinary system	3 Weeks 5 days/wk 45 min/day	• Lab - Capturing the Wild Bean • Lab - Journey through the Water Cycle • Exploring the Carbon Cycle Poster • Lab - Exploring the Nitrogen Cycle • Lab - Exploring the steps of the water, carbon, and nitrogen cycles • Activity - Types of Succession	• Textbook • Workbooks • Brainpop	• Homework • Labs • Unit Exam