

Grade: 5 Subject: Science	Unit 2: Living Systems
Big Idea/Rationale:	<ul style="list-style-type: none"> • The Living System Unit consists of three sequential investigations, each designed to introduce students to transport systems in multicellular organisms.
Enduring Understanding (Mastery Objective):	<ul style="list-style-type: none"> • Learn that the basic unit of life is the cell. • Learn that all cells have basic needs—water, food, gas exchange, and waste disposal. • Learn how materials are transported to cells in multicellular organisms. • Learn the structure and functions of the circulatory, respiratory, digestive and excretory systems in humans. • Learn that vascular plants have specialized tissue (xylem and phloem tubes) for the transport of water, minerals and sugar to cells. • Discover that leaves play an important role in the transport of water to cells in vascular plants. • Learn that green plant cells make sugar from carbon dioxide and water in the presence of sunlight and release oxygen. • Learn that plant and animal cells obtain energy by breaking down sugar into carbon dioxide and water (cellular respiration). • Classify leaves based on venation pattern. • Design, conduct and analyze the results of experiments. • Write scientific reports. • Use metric tools and make and record quantitative observations in a scientific investigation.
Essential Questions (Instructional Objectives):	<ul style="list-style-type: none"> • How are plants, animal and human life systems similar and different? • How will knowledge of the basic needs of living things enhance the quality of human lives? • How can we use scientific processes to conduct investigations and build explanations?
Content (Subject Matter & Lesson Objectives):	<p>Investigation 1 – Living Cells</p> <ul style="list-style-type: none"> • Students will use print and video resources to gather information about multiple human organ systems. • Students will describe structure and function relationships in a variety of organs in a system • Students will describe the sequence of events in complex relationships in human organ systems • Students will observe and communicate the results of an experiment on digestion • Students will identify the dependent and controlled variables in an experiment <p>Investigation 2 – Vascular Plants</p>

	<ul style="list-style-type: none"> • Students will classify objects (e.g., rocks, plants, leaves) in accordance with appropriate criteria • Students will plan and conduct an investigation to find out how water gets to the cells in a vascular plant • Students will use appropriate tools to measure mass and volume in an experiment • Students will use mathematics to analyze investigation results • Students will organize and communicate findings <p>Investigation 3 – Sugar and Cells</p> <ul style="list-style-type: none"> • Students will observe and describe evidence of yeast’s cellular respiration • Students will plan and conduct an investigation to found out how much sugar is in different breakfast cereals • Students will use appropriate tools to measure mass, volume, and temperature in an experiment • Students will use mathematics to analyze investigation results • Students will organize and communicate results of an experiment using years as an indicator of sugar • Students will identify the dependent and controlled variables in an experiment
<p>Skills/Benchmarks: (Standards)</p>	<p>5.1.A: Science Practices, Understanding Scientific Explanations</p> <ul style="list-style-type: none"> • 5.1.8.A.1: Demonstrate understanding and use interrelationships among central scientific concepts to revise explanations and to consider alternative explanations • 5.1.8.A.2: Use mathematical, physical and computational tools to build conceptual-based models and to pose theories • 5.1.8.A.3: Use scientific principles and models to frame and synthesize scientific arguments and pose theories <p>5.1.B: Science Practices, Generate Scientific Evidence Through Active Investigations</p> <ul style="list-style-type: none"> • 5.1.8.B.1: Design investigations and use scientific instrumentation to collect, analyze and evaluate evidence as part of building and revising models and explanations • 5.1.8.B.2: Gather, evaluate and represent evidence using scientific tools, technologies and computational strategies • 5.1.8.B.3: Use qualitative and quantitative evidence to develop evidence-based arguments <p>5.1.C: Science Practices, Reflect on Scientific Knowledge</p> <ul style="list-style-type: none"> • 5.1.8.C.1: Monitor one’s own thinking as understanding of scientific concepts is refined • 5.1.8.C.2 Revise predictions or explanations on the basis of discovering new evidence, learning new information or using models • 5.1.8.C.3 Generate new and productive questions to evaluate and refine core explanations

	<p>5.1.C: Science Practices, Participate Productively in Science</p> <ul style="list-style-type: none"> • 5.1.8.D.1: Engage in multiple forms of discussion in order to process, makes sense of and learn from others’ ideas, observations and experiences. • 5.1.8.D.2: Engage in productive scientific discussion practices during conversations with peers, both face to face and virtually in the context of scientific investigations and model building • 5.1.8.D.3: Demonstrate how to safely use tools, instruments and supplies <p>5.3.A: Life Science, Organization and Development</p> <ul style="list-style-type: none"> • 5.3.4.A.3: Describe the interactions of systems involved in carrying out everyday life activities • 5.3.6.A.1: Model the is interdependence of the human body’s major systems in regulating its internal environment • 5.3.6.A.2: Model and explain ways in which organelles work together to meet the cell’s needs <p>5.3.B: Life Science, Matter and Energy Transformations</p> <ul style="list-style-type: none"> • 5.3.6.B.1: Describe the sources of the reactants of photosynthesis and trace the pathway to the products • 5.3.8.B.1: Relate the energy and nutritional needs of organisms in a variety of life stages and situations, including stages of development and periods of maintenance
Materials:	<ul style="list-style-type: none"> • FOSS Livings Systems Kit: ½, 1 liter containers, dice, graduated cylinders, hand lenses, marking pens, <i>The Heart</i> poster, <i>Leaf Venation</i> Posters, <i>Circulatory/Respiratory System</i> poster, <i>Foss Safety</i> poster, 5ml spoons, 50ml syringes, thermometers (Celsius), 12-dram vials, Vial holders, <i>Circulatory and Respiratory Systems</i> video, <i>Digestive and Excretory Systems</i> video, <i>Plant Structure, and Growth</i> video, Teacher Guide, Foss Teacher Preparation video, <i>Foss Resource Books: Living Systems</i>, balances, plastic cups, gram pieces, volume tubes, food coloring (red), sticky notes, yeast. • Technology Cart, BrainPop, DiscoveryEducation, Human Body (Scholastic)
Notes:	