

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

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

	<p><b>5.1.C: Science Practices, Participate Productively in Science</b></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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</li> <li>• 5.1.8.D.3: Demonstrate how to safely use tools, instruments and supplies</li> </ul> <p><b>5.3.A: Life Science, Organization and Development</b></p> <ul style="list-style-type: none"> <li>• 5.3.4.A.3: Describe the interactions of systems involved in carrying out everyday life activities</li> <li>• 5.3.6.A.1: Model the is interdependence of the human body’s major systems in regulating its internal environment</li> <li>• 5.3.6.A.2: Model and explain ways in which organelles work together to meet the cell’s needs</li> </ul> <p><b>5.3.B: Life Science, Matter and Energy Transformations</b></p> <ul style="list-style-type: none"> <li>• 5.3.6.B.1: Describe the sources of the reactants of photosynthesis and trace the pathway to the products</li> <li>• 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</li> </ul>
<b>Materials:</b>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Technology Cart, BrainPop, DiscoveryEducation, Human Body (Scholastic)</li> </ul>
<b>Notes:</b>	