# Big Ideas/Key Concepts:
- All living things are made of cells that perform functions necessary for life.
- Matter and energy flow through the biosphere.
- Plants and animals reproduce and transmit hereditary information between generations.

## Standards

<table>
<thead>
<tr>
<th>Standards</th>
<th>Student Friendly “I Can” Statements</th>
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<tbody>
<tr>
<td><strong>Cells – Flow of Matter and Energy</strong></td>
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<tr>
<td>SPI 0707.1.5 Explain how materials move through simple diffusion.</td>
<td>I can explain how some materials move in and out of cells without the use of energy.</td>
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<td>I can predict the direction most particles will move across a membrane when I have information about the concentration on each side of the membrane.</td>
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<td>I can compare the movement of particles through active transport using the terms endocytosis and exocytosis.</td>
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<tr>
<td>7. WCE.SC.4: Design and create a model that illustrates how materials move across a semi-permeable membrane by simple diffusion.</td>
<td>I can construct a model depicting the structure and function of the cell membrane and its role in maintaining homeostasis in the organism.</td>
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<td><strong>Flow of Matter and Energy</strong></td>
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<tr>
<td>SPI 0707.3.1 Compare the chemical compounds that make up the reactants and products of photosynthesis and respiration.</td>
<td>I can interpret the meaning of photosynthesis and cellular respiration using chemical formulas.</td>
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<td>I can compare the processes of photosynthesis and cellular respiration in terms of their reactants and their products.</td>
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<tr>
<td>7. WCE.SC.5: Use a microscope as a tool to examine leaf chloroplasts.</td>
<td>I can examine and identify the chloroplasts in a leaf cell using a microscope.</td>
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<tr>
<td>SPI 0707.3.2 Interpret a diagram to explain how oxygen and carbon dioxide are exchanged between living things and the environment.</td>
<td>I can describe and model the pathways of water, oxygen and carbon dioxide through a plant.</td>
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<td>7. WCE.SC.6: Analyze structures that animals use to obtain oxygen.</td>
<td>I can analyze, explain, and illustrate the cycle of carbon from living things to the environment, back to living things (including the processes of photosynthesis and respiration).</td>
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<tr>
<td>Heredity SPI 0707.4.1 Classify methods of reproduction as sexual or asexual.</td>
<td>I can analyze, explain and illustrate the cycle of oxygen from living things to the environment, back to living things (including the processes of photosynthesis and respiration).</td>
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<tr>
<td>7. WCE.SC.7: Compare and contrast asexual cellular reproduction (mitosis) and sexual cellular reproduction (meiosis).</td>
<td>I can analyze structures that animals and plants use to obtain oxygen (stomata, skin, gills, and lungs).</td>
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<tr>
<td>SPI 0707.4.2 Match flower parts with their reproductive functions.</td>
<td>Heredity I can classify organisms according to whether they reproduce sexually or asexually (budding, fragmentation, regeneration, runners, tubers, plantlets).</td>
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<tr>
<td>7. WCE.SC.8: Use a microscope or hand lens as a tool to examine the reproductive parts of a flower.</td>
<td>I can compare and contrast the fundamental features (haploid, diploid, sperm and egg cells), as well as advantages and disadvantages of sexual and asexual reproduction.</td>
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<td>7. WCE.SC.9: Model DNA as the structural basis of a gene. Model genes as the structural basis of a chromosome.</td>
<td>I can explain the difference between meiosis and mitosis.</td>
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<tr>
<td>SPI 0707.4.3 Describe the relationship among genes, chromosomes and inherited traits.</td>
<td>I can connect flower parts with their reproductive function.</td>
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<td>I can label and explain the function of the reproductive parts of a flower and observe them using a microscope or hand lens.</td>
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<td></td>
<td>I can model and explain DNA as the structural basis of a gene.</td>
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<td></td>
<td>I can model and explain genes as the structural basis of a chromosome.</td>
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<td>I can explain the relationship among DNA, genes and chromosomes, and their role in determining inherited traits.</td>
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<td>Task</td>
<td>Ability</td>
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<td>7. WCE.SC.10: Compare and contrast: dominant vs. recessive traits,</td>
<td>I can identify and explain the difference between dominant and recessive</td>
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<td>genotype vs. phenotype, and homogeneous vs. heterogeneous.</td>
<td>traits, genotype and phenotype, and homogeneous and heterogeneous.</td>
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<tr>
<td><strong>SPI 0707.4.4</strong> Interpret a Punnett square to predict possible</td>
<td>I can create and interpret a Punnett square to predict the genotypes</td>
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<tr>
<td>genetic combinations passed from parents to offspring during sexual</td>
<td>and phenotypes of offspring resulting from a monohybrid cross.</td>
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<td>reproductions.</td>
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<td>I can draw a phenotypically accurate picture of offspring, based on a</td>
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<td>Punnett square.</td>
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<td>7. WCE.SC.11: Calculate the probability of trait inheritance.</td>
<td>I can calculate the percentage of inheriting a genotype or a phenotype,</td>
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<td>based on a Punnett square (genotype and phenotype ratios).</td>
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<td>7. WCE.SC.12: Using genetic engineering principles, design a solution</td>
<td>I can design a solution that improves quality of human life after a</td>
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<td>that improves quality of human life after a traumatic injury or</td>
<td>traumatic injury or disease using genetic engineering principles, (e.g.</td>
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<tr>
<td>disease (e.g. insulin production, disease prevention, artificial</td>
<td>insulin production, disease prevention, artificial limbs or protective</td>
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<td>limbs, etc…).</td>
<td>wear).</td>
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