2017.18 Seventh Grade Science, Ongoing Expectations

Big Ideas/Key Concepts:
- Understandings about scientific inquiry and the ability to conduct inquiry are essential for living in the 21st century.
- Society benefits when engineers apply scientific discoveries to design materials and processes that develop into enabling technologies.

Ongoing Expectations
Note: Do not teach a separate unit at year’s beginning. Embed inquiry and tech/engineering throughout all 4 quarters within content where appropriate.

Embedded Inquiry

SPI 0707.Inq.1 Design a simple experimental procedure with an identified control and appropriate variables.

SPI 0707.Inq.2 Select tools and procedures needed to conduct a moderately complex experiment.

SPI 0707.Inq.3 Interpret and translate data in a table, graph or diagram.

SPI 0707.Inq.4 Draw a conclusion that establishes a cause and effect relationship supported by evidence.

SPI 0707.Inq.5 Identify a faulty interpretation of data that is due to bias or experimental error.

Embedded Technology & Engineering

SPI 0707.T/E.1 Identify the tools and procedures needed to test the design features of a prototype.

SPI 0707.T/E.2 Evaluate a protocol to determine if the engineering design process was successfully applied.

SPI 0707.T/E.3 Distinguish between the intended benefits and the unintended consequences of a new technology.

SPI 0707.T/E.4 Differentiate between adaptive and assistive engineering products (e.g., food, biofuels, medicines, integrated pest management).
2017.18 Seventh Grade, Quarter 1

| Big Ideas/Key Concepts: |  
|------------------------|---|
| All living things are made of cells that perform functions necessary for life. |   |

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<thead>
<tr>
<th>Standards</th>
<th>Student Friendly “I Can” Statements</th>
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<tbody>
<tr>
<td><strong>Cells</strong></td>
<td><strong>Cells</strong></td>
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<tr>
<td>SPI 0707.1.1 Identify and describe the function of the major plant and animal cell organelles.</td>
<td>I can develop and construct models that identify and explain the structure and function of major cell parts (nucleus, chloroplast, mitochondria, cell membrane, cell wall, vacuole, ribosome, lysosome, endoplasmic reticulum, Golgi complex/apparatus/body, cytoplasm and centriole) as they contribute to the life activities of the cell and organism.</td>
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<tr>
<td>7. WCE.SC.1: Explain the mathematical concept behind a cell’s size.</td>
<td>I can make a Venn Diagram to compare the structures and functions of an animal cell with a city or school.</td>
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<td>7. WCE.SC.2: Use a microscope as a tool to investigate cell structure.</td>
<td>I can conceptually and mathematically explain the surface area-to-volume ratio of a cell.</td>
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<td>SPI 0707.1.2 Interpret a chart to explain the integrated relationships that exist among cells, tissues, organs, and organ systems.</td>
<td>I can investigate the structure of cell parts by use of a microscope.</td>
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<td></td>
<td>I can compare and contrast plant and animal cells.</td>
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<td>I can explain the relationship that exists among cells, tissues, organs, organ systems, and organisms.</td>
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SPI 0707.1.3 Explain the basic functions of a major organ system.

I can design a diagram displaying the hierarchical organization of multicellular organisms from cell to organism (cell, tissue, organ, organ system, and organism).

I can name, explain the basic functions of and identify 2-4 major organs of the systems of the human body: integumentary, muscular, skeletal, cardiovascular, respiratory, urinary, reproductive, nervous, digestive, lymphatic and endocrine.

7. WCE.SC.3: Identify and explain how organ systems work together to carry out life processes.

I can identify and explain how organ systems work together to carry out life processes, for example:
- muscular and skeletal (to produce movement and body structure)
- respiratory and circulatory (diffusion of oxygen and carbon dioxide)
- digestive and circulatory (diffusion of nutrients for cellular respiration).

I can construct a model depicting the structure and function of the cell membrane and its role in maintaining homeostasis in the organism.

SPI 0707.1.4 Sequence a series of diagrams that depict chromosome movement during plant cell division.

I can illustrate how cell division (mitosis) occurs in sequential stages to maintain the chromosome number of a species.

I can explain the movement of the chromosomes throughout the phases of the cell cycle: interphase, mitosis (prophase, metaphase, anaphase, telophase), cytokinesis.