Big Ideas/Key Concepts:

- Society benefits when engineers apply scientific discoveries to design materials and process that develop into enabling technologies.
- The composition and structure of matter is known, and it behaves according to principles that are generally understood.
- Everything in the universe exerts a gravitational force on everything else; there is an interplay between magnetic fields and electrical currents.
- Objects move in ways that can be observed, described, predicted, and measured.
- Major geologic events that occur over eons or brief moments in time continually shape and reshape the surface of the Earth, resulting in continuous change.

<table>
<thead>
<tr>
<th>Standards</th>
<th>Student Friendly “I Can” Statements</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Technology &amp; Engineering</strong></td>
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</tr>
<tr>
<td>SPI 0307.T/E.1 Select a tool, technology, or invention that was used to solve a human problem.</td>
<td>I can identify appropriate materials, tools, and machines that can extend or enhance the ability to solve a specific problem.</td>
</tr>
<tr>
<td>SPI 0307.T/E.2 Recognize the connection between a scientific advance and the development of a new tool or technology.</td>
<td>I can recognize the connection between scientific advances, new knowledge, and the availability of new tools and technologies.</td>
</tr>
<tr>
<td><strong>Properties of Matter - Mixtures</strong></td>
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<tr>
<td>SPI 0307.9.1 Describe a substance in terms of its physical properties.</td>
<td>I can analyze and interpret data from observations and measurements to describe and compare physical properties of matter such as: mass, hardness, flexibility, visibility, and holds a shape or takes the shape of container (state/phase of matter at room temperature).</td>
</tr>
<tr>
<td></td>
<td>I can use tools and technology to compare and contrast a minimum of two different states of matter by their physical properties.</td>
</tr>
</tbody>
</table>
3. WCE.SC.7: Develop a model of matter to describe that matter is made up of particles too small to be seen.
*Correlates with Fine Arts/Art:*
3.ART.3 re: Pointillism technique (I Can statement)

<table>
<thead>
<tr>
<th>SPI 0307.9.2</th>
<th>Identify methods for separating different types of mixtures.</th>
</tr>
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**Magnetism**

<table>
<thead>
<tr>
<th>SPI 0307.12.2</th>
<th>Identify objects that are attracted to magnets.</th>
</tr>
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<tbody>
<tr>
<td>SPI 0307.12.1</td>
<td>Recognize that magnets can move objects without touching them.</td>
</tr>
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</table>

3. WCE.SC.8: Determine the directional force of magnets when one magnet interacts with another magnet.

3. WCE.SC.9: Explain energy transfer between magnets.

**Forces and Motion**

<table>
<thead>
<tr>
<th>SPI 0307.Inq.1</th>
<th>Select an investigation that could be used to answer a specific question.</th>
</tr>
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<tbody>
<tr>
<td>SPI 0307.11.2</td>
<td>Demonstrate how changing the mass affects a balanced system.</td>
</tr>
</tbody>
</table>

*Correlates with Math:*

I can develop a model of matter to describe that matter is made up of particles too small to be seen.

I can investigate and identify different ways to separate mixtures such as the use of a magnet, visual sorting, using a sieve, filtration, evaporation or settling by density.

**Magnetism**

I can determine and describe how magnets attract objects made of certain metals.

I can generate a t-chart about what kinds of materials magnets attract. (Metals, plastics, etc.)

I can ask testable questions, make predictions and experiment with magnets to determine: the cause and effect relationship of magnets, the distance between objects affecting the strength of the magnetic force, and how the orientation affects the direction of the magnetic force.

I can make predictions about the changes in motion and position that occur when magnets exert forces on other magnets, causing energy transfer between them even when they are not touching.

**Forces and Motion**

I can plan and write an investigation to illustrate how changing the mass affects a balanced system.

I can analyze and interpret data from observations and measurements comparing the effects of different strengths and directions of pushing and pulling on the motion of an object.
3.OA.8 Identify patterns (Q1 in Math)

SPI 0307.11.1 Identify how the direction of a moving object is changed by an applied force (mass, gravity, friction).

Correlates with Math:
3.OA.8 Identify patterns (Q1 in Math)

Human Impact on the Environment

SPI 0307.7.3 Identify an object as natural or man-made.

3. WCE.SC.10: Obtain and combine information to describe that human energy needs are derived from natural resources; some that are renewable resources and some that are not.

SPI 0307.7.4 Determine methods for conserving natural resources.

Correlates with SS:
3.10 and 3.11: 3.10 Trace the development of a product from its natural resource state to a finished product.
3.11 Analyze how natural resources have impacted the economy of each region and their connections to global trade.

Correlates with Fine Arts/Art:
3.WCE.ART.11: Recycled Art

I can design and conduct an investigation to determine if a design solution works as intended to change the speed or direction of an object (momentum), using a push or pull.

Human Impact on the Environment

I can distinguish between natural and man-made objects, and between renewable and non-renewable resources.

I can use a magnifier to observe, describe, and compare materials to determine if they are natural or man-made.

I can create a web that demonstrates the link between basic human needs for energy, and the earth’s natural resources.

I can research and communicate ways in which human energy needs can be met through renewable resources vs. non-renewable resources.

I can determine through research and investigation, methods for conserving or recycling earth materials.