### Scope and Sequence for 9th – 12th grades

<table>
<thead>
<tr>
<th>Prior Knowledge and Experience</th>
<th>Develop Knowledge</th>
<th>Lessons</th>
<th>NSES Stds. for Science</th>
<th>Colo. Stds. for Science</th>
<th>Colo. Stds. for Math</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>See Prior Knowledge and Experience 6-8</strong></td>
<td><strong>Earth and Earth-Sun System</strong></td>
<td><strong>Interior of Sun</strong> Earth's Magnetic Field <strong>• Mapping the Field of a Dipole Magnet</strong> <strong>• Mapping the Ambient Magnetic Field</strong> <strong>• Mapping the field of Multiple Dipole Magnets</strong> <strong>• Earth’s Magnetic Field from Space</strong></td>
<td>A, B, E, G</td>
<td>1, 2.3, 4.4, 6</td>
<td>5.1</td>
</tr>
<tr>
<td><strong>Exterior of Sun</strong></td>
<td><strong>Interplanetary Magnetic Field (IMF)</strong></td>
<td><strong>• Mapping the Field of a Dipole Magnet</strong> <strong>• Earth's Magnetic Field from Space</strong></td>
<td>A, B, E, G</td>
<td>1, 2.3, 4.4, 6</td>
<td>5.1</td>
</tr>
<tr>
<td><strong>Solar activity</strong></td>
<td><strong>Science and Math Tools</strong></td>
<td><strong>Data collection and interpretation</strong> <strong>• Mapping the Field of a Dipole Magnet</strong> <strong>• Mapping the Ambient Magnetic Field</strong> <strong>• Mapping the field of Multiple Dipole Magnets</strong> <strong>• Earth’s Magnetic Field from Space</strong></td>
<td>A, B, E, G</td>
<td>1, 2.3, 4.4, 6</td>
<td>5.1</td>
</tr>
<tr>
<td><strong>Scientific Method</strong></td>
<td><strong>Scientific Method</strong></td>
<td><strong>• Mapping the Field of a Dipole Magnet</strong> <strong>• Mapping the Ambient Magnetic Field</strong></td>
<td>A, B, E, G</td>
<td>1, 2.3, 4.4, 6</td>
<td>5.1</td>
</tr>
</tbody>
</table>
| Graphing and Charting | Graphing and Charting | Mapping the Field of a Dipole Magnet  
| | | Mapping the Ambient Magnetic Field  
| | | Mapping the field of Multiple Dipole Magnets  
| | | A, B, E, G  
| | | 1, 2.3, 6  
| | | 5.1  
| Instrumentation | Vectors and Vector Addition | Mapping the field of Multiple Dipole Magnets  
| | | A, B, E, G  
| | | 1, 2.3, 6  
| | | 5.1  
| | | Scientific Reporting  
| | | Mapping the Ambient Magnetic Field  
| | | Earth’s Magnetic Field from Space  
| | | A, B, E, G  

**Useful Concepts:**  
E-M spectrum  
Electromagnetism

*Use discretion based on the age/abilities of the students. It is not necessary to have these skills to do lessons.*