## Interdisciplinary Unit

<table>
<thead>
<tr>
<th>Activity</th>
<th>Teacher Materials</th>
<th>Student Materials</th>
<th>Standards Addressed</th>
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<tr>
<td>What a Trip!</td>
<td>Teacher Guide</td>
<td>Student Activity, Student Handout</td>
<td>Life Skills Grades K-12: Sets and manages goals</td>
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<td></td>
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<td></td>
<td>Technology Grades K-12: Technology productivity tools, Technology problem-solving and decision-making tools</td>
</tr>
<tr>
<td>What a Trip!</td>
<td></td>
<td>Student Text</td>
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<tr>
<td>Kepler's Laws of Planetary Motion</td>
<td>Teacher Guide</td>
<td></td>
<td>Science Grades 5-8: Science As Inquiry, Physical Science, Earth and Space Science, History and Nature of Science</td>
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<td></td>
<td>Science Grades 9-12: Science As Inquiry, Physical Science, Earth and Space Science, History and Nature of Science</td>
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<tr>
<td>Round and Round</td>
<td></td>
<td>Student Activity</td>
<td>Mathematics Grades 6-8: Numbers and Operations, Algebra, Geometry, Problem Solving, Connections</td>
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<tr>
<td>Sweepstakes</td>
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<td>The Inclined Pendulum</td>
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<td>Minimum Energy Transfer Orbits</td>
<td>Teacher Guide</td>
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<td>Science Grades 5-12: Science As Inquiry, Physical Science, Earth and Space Science, History and Nature of Science</td>
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<td>Studying Orbits About Bodies in Space</td>
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<tr>
<td></td>
<td>Supplement: “Group Summary”</td>
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<td>Supplement: “Process Frame”</td>
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<td>Student Activity</td>
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<tr>
<td>Student Reporting Sheet</td>
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<tr>
<td>Hohmann Excel Student Spreadsheet</td>
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**SCIENCE**

- Science Grades 5-8
  - Science As Inquiry
  - Physical Science
  - Earth and Space Science
  - History and Nature of Science

- Science Grades 9-12
  - Science As Inquiry
  - Physical Science
  - Earth and Space Science
  - History and Nature of Science

**Mathematics Grades 6-8**

- Numbers and Operations
- Algebra
- Geometry
- Problem Solving
- Connections

**Technology Grades K-12**

- Technology productivity tools
- Technology problem-solving and decision-making tools

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**MATHEMATICS**

- Science Grades 5-12
  - Science As Inquiry
  - Physical Science
  - Earth and Space Science
  - History and Nature of Science

- Mathematics Grades 6-12
  - Algebra
  - Numbers and Operations
  - Geometry
  - Problem Solving
  - Connections

- Technology Grades K-12
  - Technology productivity tools
  - Technology problem-solving and decision-making tools
### SOCIAL STUDIES

<table>
<thead>
<tr>
<th>Course</th>
<th>Teacher Guide</th>
<th>Student Activity</th>
<th>Student Text</th>
<th>Grades</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>History Grades 5-8</td>
<td>Teacher Guide</td>
<td>Student Activity</td>
<td></td>
<td>History</td>
<td>Historical Understanding</td>
</tr>
<tr>
<td>Geography Grades 3-12</td>
<td>Teacher Guide</td>
<td>Student Activity</td>
<td></td>
<td>Geography</td>
<td>Understands the characteristics and uses of maps, globes, and other geographical tools and technologies</td>
</tr>
<tr>
<td>Economics Grades 3-8</td>
<td>Teacher Guide</td>
<td></td>
<td></td>
<td>Economics</td>
<td>Understands that scarcity of productive resources requires choices that generate opportunities.</td>
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</table>

### LANGUAGE ARTS

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<tr>
<th>Course</th>
<th>Teacher Guide</th>
<th>Activity</th>
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<tbody>
<tr>
<td>Language Arts Grades 3-8</td>
<td>Teacher Guide</td>
<td>1. Student Text</td>
<td>Uses the general skills and strategies of the reading process.</td>
</tr>
<tr>
<td>Language Arts Grades 3-12</td>
<td>Teacher Guide</td>
<td>2. Student Activity</td>
<td>Uses reading skills and strategies to understand and interpret a variety of literary texts.</td>
</tr>
<tr>
<td>Language Arts Grades 3-12</td>
<td>Teacher Guide</td>
<td>3. Student Activity</td>
<td>Uses listening and speaking strategies for different purposes.</td>
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<td>Language Arts Grades 3-12</td>
<td>Teacher Guide</td>
<td>4. Student Activity</td>
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<td>Language Arts Grades 3-12</td>
<td>Teacher Guide</td>
<td>5. Student Text</td>
<td>Uses listening and speaking strategies for different purposes.</td>
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### CULMINATING ACTIVITY

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<thead>
<tr>
<th>Activity</th>
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</table>

(View a full text of the National Science Education Standards.)

(View a full text of the Principles and Standards for School Mathematics.)

(View a full text of the National Technology Education Standards.)

(View a full text of McREL’s Compendium of Standards and Benchmarks for K-12 Education.)

**MATERIALS**

Below is a quick reference list to each teacher guide and accompanying materials for your convenience.

**What a Trip!**

For each group of two or three students:
- Student Activity, “What a Trip!” (Optional)
Kepler's Laws of Planetary Motion

For each group of two or three students:
- Butcher paper

“Round and Round”
For each group of two or three students:

For Part One
- Wide-mouth jar lid
- 200 watt light bulb
- Electrical socket
- Lamp
- Student Activity, “Round and Round”
- Pencil
- Metric ruler
- String

For Part Two
- Six push pins
- 15-centimeter loop of string
- Paper
- 30-centimeter square sheet of styrofoam

For Part Three
- Calculator or Student Spreadsheet

“Sweepstakes”
For each group of two or three students:
- Student Activity, “Sweepstakes”
- Computer with Internet connection
- Kepler’s Second Law, Animation

“The Inclined Pendulum”
For each group of four students:
- Metal ring mounted onto a piece of plywood
- Marble
- Student Activity, “The Inclined Pendulum”
- Stopwatch or other timing device
- Five textbooks (all about the same size)

Minimum Energy Transfer Orbits

For the teacher:
- Teacher Guide Supplement, “Group Summary”

For each student:
- Student Spreadsheet, “Hohmann Excel”
- Student Reporting Sheet “Minimum Transfer Orbits”
- Student Activity “Minimum Transfer Orbits”

Studying Orbits About Bodies In Space

For the teacher:
- Teacher Guide Supplement, Process Frame
For each group of three to four students:
- Student Spreadsheet [Kepler Excel spreadsheet]

For each student:
- Student Reporting Sheet “Studying Orbits About Bodies in Space”
- Student Activity “Studying Orbits About Bodies in Space”

**Joseph-Louis LaGrange**

For each student:
- Student Text [Joseph-Louis LaGrange]
- Student Activity [Joseph-Louis LaGrange]

**Where on Earth?**

For each student:
- Student Activity, “Where on Earth”
- Student Activity, “View From Above” (High School Extension)

**What a Choice!**

For each student:
- List of resources they identified in “What a Trip!”

**Science as Fiction**

For each student:
- Student Text, “Science as Fiction: Worlds Colliding”

**For Part One:**
- Copies of: The Golden Apples of the Sun
- Copies of: The Wilderness
- Student Activity, “Space Story: You are the Author”

**For Part Two:**
- Student Activity, “Getting to the Core of the Matter”

**Can We Talk?**

For each student:
- **For Part One**
  - Student Activity, “Alien Speak”
- **For Part Two**
  - Student Text, “Capturing a Whisper”

**School Trek**

For each student:
- Student Activity, “School Trek”
- Communication Development Text, “Speaking to Inform”