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<td>Core Code: 08-05-00-00-005</td>
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By the end of sixth grade students will be able to:

1. **Use Science Process and Thinking Skills**
   - **From Bacteria To Plants**
     - TE: 9, 76, 77, 81, 82, 91, 94, 107, 109, 110, 115, 143
   - **Astronomy**
     - TE: 20
   - **Motion, Forces, and Energy**
     - SE/TE: 36, 40-41, 51, 56, 90, 146, 152, 155, 159, 162, 176, 183, 188-189, 193, 212
     - TE: 66, 96, 185, 192
   - **Sound and Light**
     - TE: 9, 19, 21, 49, 61, 77, 79, 125, 127, 134
   - **The Nature of Science and Technology**
     - SE/TE: 6, 35, 49, 50, 54, 56-57, 78, 96, 128
     - TE: 7, 17
   - **From Bacteria To Plants**
     - SE/TE: 26, 35, 69, 84, 86, 98, 111, 131, 133, 148, 154, 171
     - TE: 7, 11, 28, 32, 34, 68, 82, 85, 130, 134, 153, 170, 198
   - **Astronomy**
     - SE/TE: 35, 155, 182
     - TE: 34, 43, 66, 88, 98, 112, 136
   - **Motion, Forces, and Energy**
     - SE/TE: 31, 69, 103, 141, 171, 176, 195, 201, 230
     - TE: 30, 61, 68, 102, 129, 140, 160, 163, 170, 200
   - **Sound and Light**
     - SE/TE: 31, 65, 101, 139, 166
     - TE: 10, 29, 30, 64, 81, 91, 100, 107, 131, 138
   - **The Nature of Science and Technology**
     - SE/TE: 39, 83, 119, 146
     - TE: 22, 34, 51, 67, 71, 91, 101, 105

SE = Student Edition TE = Teacher Edition TR = Teaching Resource TECH = Technology
### Utah Secondary Science Core Curriculum

#### Grade 6

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<td>43, 44-51, 54, 56-57, 63, 64, 76, 130-131, 152</td>
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<tr>
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<td>9, 26, 29, 46, 59, 69, 70, 75, 83, 84, 86, 91, 95, 100, 111, 124, 129, 131, 132, 145, 150, 157, 164, 172, 197</td>
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<td>Astronomy</td>
<td>5, 13, 27, 33, 36, 45, 56, 57, 62, 67-68, 71, 77, 82, 91, 96, 101, 107, 113-114, 124, 133, 140, 156, 181</td>
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<tr>
<td>Motion, Forces, and Energy</td>
<td>8, 11, 15, 39, 47, 49, 50, 69, 80, 87, 94, 99, 121, 133, 141, 172, 176, 181, 194, 199, 229</td>
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<tr>
<td>Sound and Light</td>
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<tr>
<td>The Nature of Science and Technology</td>
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**SE = Student Edition**  **TE = Teacher Edition**  **TR = Teaching Resource**  **TECH = Technology**
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| g. Formulate simple research questions. | From Bacteria To Plants  
SE/TE: 5, 16, 38-39, 87, 88, 96-97, 120-121, 126, 134-135, 184, 196  
TE: 61, 107  
TR: All In One Teaching Resources: 38-44, 100-102, 177-178, 186-188, 232-234, 272-273  
Astronomy  
SE/TE: 3, 6, 16, 48, 108, 134-135, 168, 180  
TE: 41, 96  
TR: All In One Teaching Resources: 267-269  
Motion, Forces, and Energy  
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TE: 53, 97, 125, 161  
Sound and Light  
SE/TE: 17, 84, 119, 125, 152, 164  
TE: 71, 91, 105, 131  
The Nature of Science and Technology  
SE/TE: 6, 13, 14, 15, 19, 25, 26, 32, 60, 132, 144 |
| h. Predict results of investigations based on prior data. | From Bacteria To Plants  
SE/TE: 19, 36, 40, 46, 47, 53, 56, 60, 65, 70, 72-73, 80, 84, 86, 87, 95, 97, 100, 106, 111, 122, 132, 150, 163, 164, 165, 172, 180, 184  
TE: 43, 64, 160  
Astronomy  
TE: 10, 12, 16, 22, 30, 75, 138  
Motion, Forces, and Energy  
TE: 82, 197  
Sound and Light  
SE/TE: 11, 12, 16, 17, 18, 23, 32, 39, 41, 45, 47, 53, 66, 93, 96, 102, 109, 112, 120, 123, 124, 148, 152  
TE: 80  
The Nature of Science and Technology  
SE/TE: 5, 9, 15, 16-17, 19-20, 22, 23, 34, 35, 40, 55, 60, 73, 77, 84, 93, 96, 101, 120, 128, 132  
TE: 9, 74 |
i. Use data to construct a reasonable conclusion.

From Bacteria To Plants
TE: 28, 52, 54, 56, 93, 148, 154

Astronomy
SE/TE: 15, 29, 52, 53, 58, 63, 72, 76, 77, 80, 83, 90, 114, 135, 136, 150, 169
TE: 43, 53, 58, 72, 80, 120, 123, 136

Motion, Forces, and Energy

Sound and Light
SE/TE: 5, 16, 29, 38, 39, 44, 48, 53, 63, 69, 73, 76, 88-89, 92, 97-99, 102, 111, 120, 124, 136, 153

The Nature of Science and Technology
SE/TE: 5, 18, 19, 23, 40, 56-57, 58-59, 67, 73, 75, 76, 84, 111, 120, 133
TE: 19, 28

2. Manifest Scientific Attitudes and Interests
a. Demonstrate a sense of curiosity about nature.

From Bacteria To Plants
SE/TE: 6, 25, 26, 30, 48, 74, 84, 87, 88, 104, 114, 120-121, 122, 126, 136, 146, 151, 158-159, 160
TR: All In One Teaching Resources: 63-65, 177-178, 232-234, 302-304

Astronomy
TR: All In One Teaching Resources: 202-204

Motion, Forces, and Energy
SE/TE: 81, 95, 124, 166, 176, 183, 190
TR: All In One Teaching Resources: 182-184

Sound and Light
SE/TE: 6, 11, 53, 70, 113, 119, 125
TR: All In One Teaching Resources: 132-134

The Nature of Science and Technology
SE/TE: 6, 12, 13, 23
TR: All In One Teaching Resources: 61-63
b. Voluntarily read and look at books and other materials about science.

From Bacteria To Plants
SE/TE: 196-198
TR: T12; Guided Reading and Study Workbook
TECH: Discovery Channel School Video; www.SciLinks.org; www.PHSchool.com; Student Express CD-ROM

Astronomy
SE/TE: 180-182
TR: T12; Guided Reading and Study Workbook
TECH: Discovery Channel School Video; www.SciLinks.org; www.PHSchool.com; Student Express CD-ROM

Motion, Forces, and Energy
SE/TE: 228-230
TR: T12; Guided Reading and Study Workbook
TECH: Discovery Channel School Video; www.SciLinks.org; www.PHSchool.com; Student Express CD-ROM

Sound and Light
SE/TE: 164-166
TR: T12; Guided Reading and Study Workbook
TECH: Discovery Channel School Video; www.SciLinks.org; www.PHSchool.com; Student Express CD-ROM

The Nature of Science and Technology
SE/TE: 144-146
TR: T12; Guided Reading and Study Workbook
TECH: Discovery Channel School Video; www.SciLinks.org; www.PHSchool.com; Student Express CD-ROM

c. Pose science questions about objects, events, and processes.

From Bacteria To Plants
SE/TE: 5, 16, 38-39, 87, 88, 96-97, 120-121, 126, 134-135, 184, 196
TE: 61, 107
TR: All In One Teaching Resources: 38-44, 100-102, 177-178, 186-188, 232-234, 272-273

Astronomy
SE/TE: 3, 6, 16, 48, 108, 134-135, 168, 180
TE: 41, 96
TR: All In One Teaching Resources: 267-269

Motion, Forces, and Energy
SE/TE: 36, 90, 108, 158, 216, 228
TE: 53, 97, 125, 161

Sound and Light
SE/TE: 17, 84, 119, 125, 152, 164
TE: 71, 91, 105, 131

The Nature of Science and Technology
SE/TE: 6, 13, 14, 15, 19, 25, 26, 32, 60, 132, 144

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| d. Maintain an open and questioning mind toward new ideas and alternative points of view. | From Bacteria To Plants  
SE/TE: 19, 36, 40, 46, 47, 53, 56, 60, 65, 70, 72-73, 80, 84, 86, 87, 95, 97, 100, 106, 111, 122, 132, 150, 163, 164, 165, 172, 180, 184  
TE: 43, 64, 160; Address Misconceptions: 12, 50, 81, 118, 143  
Astronomy  
TE: 10, 12, 16, 22, 30, 75, 138; Address Misconceptions: 4G, 12, 38H, 54, 70I, 89, 109, 116H, 121, 139  
Motion, Forces, and Energy  
Sound and Light  
SE/TE: 11, 12, 16, 17, 18, 23, 32, 39, 41, 45, 47, 53, 66, 93, 96, 102, 109, 112, 120, 123, 124, 148, 152  
TE: 80; Address Misconceptions: 4H, 28, 34I, 45, 68G, 76, 104H, 104I, 104J, 110, 121, 126  
The Nature of Science and Technology  
SE/TE: 5, 9, 15, 16-17, 19-20, 22, 23, 24-28, 34, 35, 40, 55, 60, 73, 77, 84, 93, 96, 101, 120, 128  
TE: 9, 74; Address Misconceptions: 4G, 4H, 8, 33, 42G, 42H, 62, 71, 86F, 90 |
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| e. Seek and weigh evidence before drawing conclusions. | **From Bacteria To Plants**  
SE/TE: 1-3, 15, 25, 47, 59, 67, 87, 97, 121, 125, 159, 169, 185  
**Astronomy**  
SE/TE: 3, 15, 29, 47, 63, 83, 103, 125, 135, 169  
**Motion, Forces, and Energy**  
SE/TE: 17, 29, 41, 63, 81, 89, 123, 137, 157, 165, 182, 189, 217  
**Sound and Light**  
**The Nature of Science and Technology**  
SE/TE: 18-19, 23, 35, 57, 76, 96, 107, 133 |
| f. Accept and use scientific evidence to help resolve ecological problems. | **From Bacteria To Plants**  
TR: All In One Teaching Resources: 38-44, 53-54, 63-65, 177-178, 232-234, 302-304, 319-321  
**Astronomy**  
SE/TE: 108-111  
**Motion, Forces, and Energy**  
SE/TE: 18-21, 158, 166-169  
TR: Guided Reading and Study Workbook: 62-64  
TECH: www.SciLinks.org/scn-1354  
**Sound and Light**  
SE/TE: 24-25, 26-29  
TR: All In One Teaching Resources: 69-71; Guided Reading and Study Workbook: 74-76  
TECH: www.SciLinks.org/scn-1514; Discovery Channel School Video-Characteristics of Waves  
**The Nature of Science and Technology**  
TR: All In One Teaching Resources: 204, 205  
TECH: www.SciLinks.org/scn-1633 |
3. Understand Science Concepts and Principles

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<td>TE: 7, 12, 25, 27, 31, 33, 37, 45, 61, 67, 69, 78, 89, 99, 101, 109, 111</td>
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<td>TR: All In One Teaching Resources: 38-39, 61-63, 78-80, 102-103, 118-121, 138-139, 175-176, 185-187</td>
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a. Know and explain science information specified for the grade level.

SE = Student Edition  TE = Teacher Edition  TR = Teaching Resource  TECH = Technology
b. Distinguish between examples and non-examples of concepts that have been taught.

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<td>Astronomy</td>
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<th>4. Communicate Effectively Using Science Language and Reasoning</th>
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| **a.** Record data accurately when given the appropriate form (e.g., table, graph, chart). | From Bacteria To Plants  
Astronomy  
SE/TE: 35, 46, 63, 83, 155  
Motion, Forces, and Energy  
Sound and Light  
The Nature of Science and Technology  
SE/TE: 23, 39, 56-57, 75, 76, 83, 119 |
| **b.** Describe or explain observations carefully and report with pictures, sentences, and models. | From Bacteria To Plants  
SE/TE: 15, 19, 21, 36, 37, 38-39, 47, 49, 53, 70, 80, 81, 92, 94, 97, 100, 101, 102-103, 105, 106, 111, 123, 128, 132, 133, 143, 148, 154, 156, 158-159, 163, 172, 173, 181  
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SE/TE: 6, 11, 12, 14, 15, 19, 21, 22, 24, 25, 26, 27, 28-29, 36, 42, 44, 45, 63, 68, 71, 73, 74, 76, 77, 80, 81, 83, 85, 97, 98, 102-103, 114, 117, 119, 129, 131, 132, 135, 138, 141, 142, 145, 150, 156, 165  
TE: 8, 17, 31, 51, 79, 90, 95, 111, 120, 121, 122, 123, 127, 139, 144  
Motion, Forces, and Energy  
TE: 7, 8, 12, 18, 38, 49, 78, 92, 116, 125, 126, 129, 133, 141  
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TE: 46, 72, 93, 94, 116 |
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<td>TE: 40, 49, 51, 55, 59, 61, 75, 87, 89, 105, 109, 133, 137</td>
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**c. Use scientific language in oral and written communication.**

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| d. Use reference sources to obtain information and cite the source. | From Bacteria To Plants  
SE/TE: 197  
TE: 30  
TR: All In One Teaching Resources: 21; Guided Reading and Study Workbook-Enrich Worksheets  
TECH: www.PHSchool.com; www.SciLinks.org; Student Express CD-ROM; Discovery Channel School Video  
Astronomy  
SE/TE: 181  
TE: 148  
TR: All In One Teaching Resources: 21; Guided Reading and Study Workbook-Enrich Worksheets  
TECH: www.PHSchool.com; www.SciLinks.org; Student Express CD-ROM; Discovery Channel School Video  
Motion, Forces, and Energy  
SE/TE: 229  
TR: All In One Teaching Resources: 21; Guided Reading and Study Workbook-Enrich Worksheets  
TECH: www.PHSchool.com; www.SciLinks.org; Student Express CD-ROM; Discovery Channel School Video  
Sound and Light  
SE/TE: 165  
TR: All In One Teaching Resources: 21; Guided Reading and Study Workbook-Enrich Worksheets  
TECH: www.PHSchool.com; www.SciLinks.org; Student Express CD-ROM; Discovery Channel School Video  
The Nature of Science and Technology  
SE/TE: 145  
TR: All In One Teaching Resources: 21; Guided Reading and Study Workbook-Enrich Worksheets  
TECH: www.PHSchool.com; www.SciLinks.org; Student Express CD-ROM; Discovery Channel School Video |

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| e. Use mathematical reasoning to communicate information. | From Bacteria To Plants  
SE/TE: 19, 46, 47, 53, 94, 106, 156, 157, 177, 182-183, 191-195  
TR: All In One Teaching Resources: 13-15, 17, 115-116  
Astronomy  
SE/TE: 18, 43, 76, 100, 101, 114, 146, 150, 156, 160, 166-167, 175-179  
TR: All In One Teaching Resources: 27-29, 31; Guided Reading and Study Workbook: 58  
Motion, Forces, and Energy  
SE/TE: 9, 15, 25, 27, 32, 48, 53, 54, 58, 61, 70, 75, 80, 93, 104, 112, 113, 119, 120, 121, 142, 148, 150, 153, 172, 179, 180, 181, 202, 210-211, 214-215, 223-227  
TR: All In One Teaching Resources: 13-15, 17, 73-74, 209-210, 270-272, 334; Guided Reading and Study Workbook: 10, 11, 13, 15, 16, 24-27, 35, 42, 45  
Sound and Light  
SE/TE: 8, 15, 28, 32, 39, 78, 81, 92, 102, 120, 145, 150-151, 159-163  
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The Nature of Science and Technology  
SE/TE: 9, 44, 45, 46-48, 49, 50-51, 52-53, 54, 55, 58-59, 60-67, 73, 84, 111, 125, 130-131, 139-143  
TR: All In One Teaching Resources: 10-12, 17; Guided Reading and Study Workbook: 24-28, 29-32 |

SE = Student Edition  
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TR = Teaching Resource  
TECH = Technology
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5. Demonstrate Awareness of Social and Historical Aspects of Science

a. Cite examples of how science affects life.

**From Bacteria To Plants**
SE/TE: 39, 62-64, 65, 66-67, 84-86, 165-167
TR: All In One Teaching Resources: 100-106, 172-175, 313-317; Guided Reading and Study Worksheets: Bacteria, Viruses and Your Health, Algal Blooms
TECH: Discovery Channel School Video-Viruses and Bacteria; www.SciLinks.org/scn-0132, scn-0155

**Astronomy**
SE/TE: 40-45, 46-47, 58-62, 118
TR: All In One Teaching Resources: 110-115, 116-117, 132-135, 250; Guided Reading and Study Worksheets: The Science of Rockets, Using Space Science on Earth, Telescopes

**Motion, Forces, and Energy**
SE/TE: 95-99, 100-101, 138-139, 166-169
TR: All In One Teaching Resources: 202-206, 328-332; Guided Reading and Study Worksheets: Bernoulli’s Principle, Energy and Fossil Fuels

**Sound and Light**
SE/TE: 58-59, 82-83, 93, 94-95, 205-210
TR: All In One Teaching Resources: 188-194

**The Nature of Science and Technology**
TR: All In One Teaching Resources: 65-70, 200-207; Guided Reading and Study Worksheets: Why Study Science, Technology and Society
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</table>
| b. Understand the cumulative nature of science knowledge. | From Bacteria To Plants  
SE/TE: 6-11, 16-24, 26-29, 30-33  
TR: All In One Teaching Resources: 46-51, 56-61, 67-70, 71; Guided Reading and Study Worksheets: What Is Life, Classifying Organisms, Domains and Kingdoms, The Origin of Life  
TECH: Discovery Channel School Video-Living Things; Student Express CD-ROM;  
www.PHSchool.com/cep-1011;  
www.SciLinks.org/scn-0114; Transparencies: A5, A6  
Astronomy  
SE/TE: 72-77  
TR: All In One Teaching Resources: 172-176, 177; Guided Reading and Study Worksheet: Observing the Solar System  
TECH: Student Express CD-ROM;  
www.PHSchool.com/cfp-5031  
Motion, Forces, and Energy  
TE: 34I, 72H  
TR: All In One Teaching Resources: 122-125, 128-131, 196-200, 202-206; Guided Reading and Study Worksheets: Newton’s First and Second Laws, Newton’s Third Law, Pascal’s Principle  
TECH: Student Express CD-ROM;  
www.PHSchool.com/cgd-3023;  
www.SciLinks.org/scn-1334  
Sound and Light  
SE/TE: 60-63, 129-137  
TR: All In One Teaching Resources: 144-148, 279-284; Guided Reading and Study Worksheet: Using Sound  
The Nature of Science and Technology  
SE/TE: 30-34, 108-115  
TR: All In One Teaching Resources: 72-77, 200-204, 205; Guided Reading and Study Worksheet: Technology and Society  
TECH: www.SciLinks.org/scn-1633 |
6. Understand the Nature of Science

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<th>PAGE(S) WHERE TAUGHT (If submission is not book, cite appropriate location(s))</th>
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</table>
| a. Science is a way of knowing that is used by many people not just scientists. | From Bacteria To Plants  
TECH: Student Express CD-ROM; www.PHSchool.com/ceb-1000  
Astronomy  
SE/TE: x, 1-3, 64-65, 92-93, 164-165, 168-169, 170-171  
TECH: Student Express CD-ROM; www.PHSchool.com/cfp-5000, cfh-5020, cfh-5030  
Motion, Forces, and Energy  
TECH: Student Express CD-ROM; www.PHSchool.com/cgb-3000, cgh-3030, cgh-3040  
Sound and Light  
SE/TE: x, 1-3, 58-59, 82-83, 148-149, 152-153, 154-155  
TECH: Student Express CD-ROM; www.PHSchool.com/cgb-5000, cgh-5020, cgh-5030  
The Nature of Science and Technology  
TECH: Student Express CD-ROM; www.PHSchool.com/cgb-6000, cgh-6020, cgh-6030 |
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</table>
| b. Understand that science investigations use a variety of methods and do not always use the same set of procedures; understand that there is not just one "scientific method." | From Bacteria To Plants  
SE/TE: 184-185, 186-187; Observing: 4, 14, 20, 25, 40, 50, 58, 74, 76, 82, 88, 91, 102, 114, 125, 134, 138, 143, 158; Designing Experiments: 13, 53, 72, 120; Making Models: 32, 41, 42, 47, 78, 80, 92, 102, 139, 153; Design Your Own Lab: 120-121  
Astronomy  
SE/TE: 168-169, 170-171; Observing: 14, 28, 42, 46, 78, 84, 95, 116, 118, 126, 145; Designing Experiments: 46, 102; Making Models: 6, 14, 24, 28, 38, 70, 98, 102, 129, 141; Design Your Own Lab: 102-103  
Motion, Forces, and Energy  
SE/TE: 216-217, 218-219; Observing: 36, 51, 66, 90, 146, 152, 162, 176, 183, 185, 188-189, 192, 193; Designing Experiments: 17, 41, 63, 81, 89, 123, 157, 165, 174, 189; Making Models: 7, 19, 20, 34, 38, 60, 72, 92, 126, 127, 129, 136-137, 144, 161; Design Your Own Lab: 81  
Sound and Light  
The Nature of Science and Technology  
SE/TE: 7, 8, 9, 10, 11, 16-17, 21, 22, 132-133, 134-135; Observing: 6, 17, 35, 96; Designing Experiments: 4, 23; Making Models: 42, 86; Design Your Own Lab: 23 |
c. Science findings are based upon evidence.

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<td>TE: 28, 52, 54, 56, 93, 154</td>
</tr>
<tr>
<td>Astronomy</td>
<td>SE/TE: 15, 29, 52, 53, 58, 72, 76, 77, 90, 114, 136, 150</td>
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<td></td>
<td>TE: 43</td>
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<tr>
<td>Sound and Light</td>
<td>SE/TE: 38, 48, 53, 63, 73, 76, 88-89, 97-99, 111, 136</td>
</tr>
<tr>
<td>The Nature of Science and Technology</td>
<td>SE/TE: 5, 19, 23, 40, 56-57, 58-59, 73, 76, 111, 136</td>
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<td>TE: 28</td>
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**Core Standards of the Course**

**Benchmark:** The appearance of the lighted portion of the moon changes in a predictable cycle as a result of the relative positions of Earth, the moon, and the sun. Earth turns on an axis that is tilted relative to the plane of Earth's yearly orbit. The tilt causes sunlight to fall more intensely on different parts of the Earth during various parts of the year. The differences in heating of Earth's surface and length of daylight hours produce the seasons.

**STANDARD I: Students will understand that the appearance of the moon changes in a predictable cycle as it orbits Earth and as Earth rotates on its axis.**

**Objective 1:** Explain patterns of changes in the appearance of the moon as it orbits Earth.

**a. Describe changes in the appearance of the moon during a month.**

- **Astronomy**
  - SE/TE: 4-5, 20-25, 28-29
  - TE: 4H
  - TR: All In One Teaching Resources: 38-44, 62-67, 69-70; Guided Reading and Study Workbook: 14-16
  - TECH: Student Express CD-ROM; www.PHSchool.com/cfp-5013; Transparencies: J8, J9, J10; Discovery Channel School Video-Earth, Moon And Sun

**b. Identify the pattern of change in the moon’s appearance.**

- **Astronomy**
  - SE/TE: 4-5, 20-25, 28-29
  - TE: 4H
  - TR: All In One Teaching Resources: 38-44, 62-67, 69-70; Guided Reading and Study Workbook: 14-16
  - TECH: Student Express CD-ROM; www.PHSchool.com/cfp-5013; Transparencies: J8, J9, J10; Discovery Channel School Video-Earth, Moon And Sun

SE = Student Edition TE = Teacher Edition TR = Teaching Resource TECH = Technology
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<tr>
<td>c. Use observable evidence to explain the movement of the moon around Earth in relationship to Earth turning on its axis and the position of the moon changing in the sky.</td>
<td>Astronomy SE/TE: 4-5, 6, 7, 10-13, 14-15, 16-19, 20-27, 28-29 TE: 4G-4H TR: All In One Teaching Resources: 38-44, 46-50, 62-67, 69-70; Guided Reading and Study Workbook: 9-11, 12-13, 14-16; Transparency: J2, J3, J6, J8 TECH: Student Express CD-ROM; <a href="http://www.PHSchool.com/cfp-5013">www.PHSchool.com/cfp-5013</a>; Discovery Channel School Video-Earth, Moon And Sun</td>
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<tr>
<td>Objective 2: Demonstrate how the relative positions of Earth, the moon, and the sun create the appearance of the moon’s phases.</td>
<td></td>
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<tr>
<td>a. Identify the difference between the motion of an object rotating on its axis and an object revolving in orbit.</td>
<td>Astronomy SE/TE: 6, 7, 10-13, 14-15, 18-19, 20-21, 23 TE: 4G, 8 TR: All In One Teaching Resources: 46-54, 80-84, 97; Guided Reading and Study Workbook: 10</td>
</tr>
<tr>
<td>b. Compare how objects in the sky (the moon, planets, stars) change in relative position over the course of the day or night.</td>
<td>Astronomy SE/TE: 4-5, 6, 7, 20-23, 70-71, 72-77, 102-103; Appendix B-Star Charts TE: 4G, 74, 75 TR: All In One Teaching Resources: 38-44, 46-50, 164-170, 172-177, 201, 202-204 TECH: Student Express CD-ROM; <a href="http://www.PHSchool.com/cfp-5013">www.PHSchool.com/cfp-5013</a>, cfp-5031; Discovery Channel School Videos: Earth, Moon And Sun, The Solar System</td>
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SE = Student Edition TE = Teacher Edition TR = Teaching Resource TECH = Technology
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<tr>
<th>STANDARD II: Students will understand how Earth’s tilt on its axis changes the length of daylight and creates the seasons.</th>
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<tbody>
<tr>
<td><strong>Objective 1:</strong> Describe the relationship between the tilt of Earth’s axis and its yearly orbit around the sun.</td>
</tr>
<tr>
<td><strong>a.</strong> Describe the yearly revolution (orbit) of Earth around the sun.</td>
</tr>
<tr>
<td><strong>Astronomy</strong></td>
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<tr>
<td>SE/TE: 7-9, 16, 19</td>
</tr>
<tr>
<td>TE: 4G</td>
</tr>
<tr>
<td>TR: All In One Teaching Resources: 46-48, 50; Guided Reading and Study Workbook: 9-11</td>
</tr>
<tr>
<td>TECH: Discovery Channel School Video-Earth, Moon, and Sun</td>
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<tr>
<td><strong>b.</strong> Explain that Earth’s axis is tilted relative to its yearly orbit around the sun.</td>
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<tr>
<td><strong>Astronomy</strong></td>
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<tr>
<td>SE/TE: 10-11, 12-13, 14-15</td>
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<tr>
<td>TE: Address Misconceptions: 12</td>
</tr>
<tr>
<td>TR: All In One Teaching Resources: 46, 48-49, 50, 51, 52-54; Guided Reading and Study Workbook: 9-11</td>
</tr>
<tr>
<td>TECH: Student Express CD-ROM; <a href="http://www.PHSchool.com/cfp-5012">www.PHSchool.com/cfp-5012</a>; Transparencies: J2, J3</td>
</tr>
<tr>
<td><strong>c.</strong> Investigate the relationship between the amount of heat absorbed and the angle to the light source.</td>
</tr>
<tr>
<td><strong>Astronomy</strong></td>
</tr>
<tr>
<td>SE/TE: 10-11, 12-13, 14-15</td>
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<tr>
<td>TE: Address Misconceptions: 12</td>
</tr>
<tr>
<td>TR: All In One Teaching Resources: 46, 48-49, 50, 51, 52-54; Guided Reading and Study Workbook: 9-11</td>
</tr>
<tr>
<td>TECH: Student Express CD-ROM; <a href="http://www.PHSchool.com/cfp-5012">www.PHSchool.com/cfp-5012</a>; Transparencies: J2, J3</td>
</tr>
<tr>
<td><strong>Objective 2:</strong> Explain how the relationship between the tilt of Earth’s axis and its yearly orbit around the sun produces the seasons.</td>
</tr>
<tr>
<td><strong>a.</strong> Compare Earth’s position in relationship to the sun during each season.</td>
</tr>
<tr>
<td><strong>Astronomy</strong></td>
</tr>
<tr>
<td>SE/TE: 7-9, 10-11, 12-13, 14-15</td>
</tr>
<tr>
<td>TE: Address Misconceptions: 12</td>
</tr>
<tr>
<td>TR: All In One Teaching Resources: 46, 48-49, 50, 51, 52-54; Guided Reading and Study Workbook: 9-11</td>
</tr>
<tr>
<td>TECH: Discovery Channel School Video-Earth, Moon, and Sun; Student Express CD-ROM; <a href="http://www.PHSchool.com/cfp-5012">www.PHSchool.com/cfp-5012</a>; Transparencies: J2, J3</td>
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### UTAH SECONDARY SCIENCE CORE CURRICULUM

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| b. Compare the hours of daylight and illustrate the angle that the sun's rays strikes the surface of Earth during summer, fall, winter, and spring in the Northern Hemisphere. | **Astronomy**  
SE/TE: 7-9, 10-11, 12-13, 14-15  
TE: Address Misconceptions: 12  
TR: All In One Teaching Resources: 46, 48-49, 50, 51, 52-54; Guided Reading and Study Workbook: 9-11  
TECH: Discovery Channel School Video-Earth, Moon, and Sun; Student Express CD-ROM; www.PHSchool.com/cfp-5012; Transparencies: J2, J3 |
| c. Use collected data to compare patterns relating to seasonal daylight changes. | **Astronomy**  
SE/TE: 14-15  
TR: All In One Teaching Resources: 51, 52-54; Guided Reading and Study Workbook: 9-11 |
| d. Use a drawing and/or model to explain that changes in the angle at which light from the sun strikes Earth, and the length of daylight, determine seasonal differences in the amount of energy received. | **Astronomy**  
SE/TE: 14-15  
TR: All In One Teaching Resources: 51, 52-54; Guided Reading and Study Workbook: 9-11  
TECH: Student Express CD-ROM; www.PHSchool.com/cfp-5012 |
| e. Use a model to explain why the seasons are reversed in the Northern and Southern Hemispheres. | **Astronomy**  
SE/TE: 14-15  
TR: All In One Teaching Resources: 51, 52-54; Guided Reading and Study Workbook: 9-11  
TECH: Student Express CD-ROM; www.PHSchool.com/cfp-5012 |
**Benchmark:** The solar system consists of planets, moons, and other smaller objects including asteroids and comets that orbit the sun. Planets in the solar system differ in terms of their distance from the sun, number of moons, size, composition, and ability to sustain life. Every object exerts gravitational force on every other object depending on the mass of the objects and the distance between them. The sun’s gravitational pull holds Earth and other planets in orbit. Earth’s gravitational force holds the moon in orbit. The sun is one of billions of stars in the Milky Way galaxy, that is one of billions of galaxies in the universe. Scientists use a variety of tools to investigate the nature of stars, galaxies, and the universe. Historically, cultures have observed objects in the sky and understood and used them in various ways.

**STANDARD III:** Students will understand the relationship and attributes of objects in the solar system.

**Objective 1:** Describe and compare the components of the solar system.

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</table>
| **Astronomy**                          | SE/TE: 72-77, 84-91, 94-101
|                                        | TE: 70I, 70J
|                                        | TR: All In One Teaching Resources: 172, 173-175, 176, 177, 187, 188-191, 192, 195, 196-199, 200;
|                                        | Guided Reading and Study Workbook: 33-35, 38-45
|                                        | TECH: Discovery Channel School Video-The Solar System; Student Express CD-ROM;
|                                        | Transparencies: J26, J30, J32
| **Sound and Light**                    | SE/TE: 129

| **Astronomy**                          | SE/TE: 70-71, 72-77, 84-91, 94-101, 102-103, 151, 193, 201
|                                        | TE: 70I, 70J
|                                        | TR: All In One Teaching Resources: 21, 22, 24, 26, 28, 30-31, 35, 36, 155-156, 158-163, 164-170, 172, 173-175, 176, 177, 187, 188-191, 192, 195, 196-199, 200, 202-204;
|                                        | Guided Reading and Study Workbook: 33-35, 38-45
|                                        | TECH: Discovery Channel School Video-The Solar System; Student Express CD-ROM;
|                                        | Transparencies: J26, J29, J30, J32
| **Sound and Light**                    | SE/TE: 129

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**SE** = Student Edition **TE** = Teacher Edition **TR** = Teaching Resource **TECH** = Technology
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</table>
| c. Use models and graphs that accurately depict scale to compare the size and distance between objects in the solar system. | Astronomy  
SE/TE: 70-71, 72, 76-77, 84-85, 94-95  
TR: All In One Teaching Resources: 164-170, 173, 189, 192, 197, 201, 202-204; Guided Reading and Study Workbook: 33, 39, 43  
TECH: Discovery Channel School Video-The Solar System; Student Express CD-ROM;  
www.PHSchool.com/ced-5034, cfp-5031;  
www.SciLinks.org/scn-0633 |
| d. Describe the characteristics of comets, asteroids, and meteors. | Astronomy  
SE/TE: 76, 104-107  
TE: 70J  
TR: All In One Teaching Resources: 206-209, 210; Guided Reading and Study Workbook: 46-47  
TECH: www.SciLinks.org/scn-0635; Transparency: J32 |
| e. Research and report on the use of manmade satellites orbiting Earth and various planets. | Astronomy  
SE/TE: 48, 49, 53, 54, 55, 62, 64-65  
TE: 38G  
TR: All In One Teaching Resources: 119, 120, 123, 126, 127-128, 129, 132, 136, 152, 154; Guided Reading and Study Workbook: 25, 28, 29  
TECH: Discovery Channel School Video-Exploring Space; Student Express CD-ROM;  
www.PHSchool.com/cfh-5020 |

Objective 2: Describe the use of technology to observe objects in the solar system and relate this to science’s understanding of the solar system.

| a. Describe the use of instruments to observe and explore the moon and planets. | Astronomy  
TECH: Discovery Channel School Videos: Exploring Space, The Solar System; Student Express CD-ROM;  
www.PHSchool.com/cfb-5000. cfp-5021, cfd-5021, cfd-5022, cfh-5020, cfh-5030;  
Sound and Light  
SE/TE: 80, 94-96, 129, 130, 135 |
**b.** Describe the role of computers in understanding the solar system (e.g., collecting and interpreting data from observations, predicting motion of objects, operating space probes).

Astronomy

**Sound and Light**
- SE/TE: 80, 94-96, 135

**c.** Relate science’s understanding of the solar system to the technology used to investigate it.

Astronomy

**Sound and Light**
- SE/TE: 80, 94-96, 129, 130, 135

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**SE** = Student Edition  **TE** = Teacher Edition  **TR** = Teaching Resource  **TECH** = Technology
**Objective 3:** Describe the forces that keep objects in orbit in the solar system.

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| d. Find and report on ways technology has been and is being used to investigate the solar system. | Astronomy  
**The Nature of Science and Technology**  
SE/TE: 28, 31, 32, 33, 91-93, 116-117, 122-123  
TE: 86F  
| a. Describe the forces holding Earth in orbit around the sun, and the moon in orbit around Earth. | Astronomy  
SE/TE: 7, 16-19, 20, 21, 23, 26, 27, 42, 43, 78  
TE: 4G, 8, 26  
TR: All In One Teaching Resources: 56-59, 62, 67, 72, 75; Guided Reading and Study Workbook: 12-13  
TECH: www.SciLinks.org/scn-0612; Transparencies: J5, J6, J13  
**Motion, Forces, and Energy**  
SE/TE: 42, 46-50, 65, 66, 67  
TE: 34H, 65  
TR: All In One Teaching Resources: 114, 117, 118; Guided Reading and Study Workbook: 20-23  
TECH: Transparency: M14 |  |
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<th>PAGE(S) WHERE TAUGHT (If submission is not book, cite appropriate location(s))</th>
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| b. Relate a celestial object’s mass to its gravitational force on other objects. | **Astronomy**  
SE/TE: 17, 18-19, 137-140, 152  
TR: All In One Teaching Resources: 21, 56-59, 60;  
Guided Reading and Study Workbook: 12-13  
TECH: Student Express CD-ROM;  
www.PHSchool.com/cfp-5043; Transparencies: J5, J6  
**Motion, Forces, and Energy**  
SE/TE: 46-47, 51-53  
TR: All In One Teaching Resources: 21, 108, 114-118, 122-126; Guided Reading and Study Workbook: 22-23, 24-25  
TECH: Student Express CD-ROM;  
www.PHSchool.com/cgd-3023 |
| c. Identify the role gravity plays in the structure of the solar system. | **Astronomy**  
SE/TE: 16-18, 19, 42, 43, 59, 78, 140  
TR: All In One Teaching Resources: 21, 56-59;  
Guided Reading and Study Workbook: 12-13  
TECH: www.SciLinks.org/scn-0612; Transparency: J5, J6  
**Motion, Forces, and Energy**  
SE/TE: 46-47, 66  
TR: Guided Reading and Study Workbook: 22-23  
TECH: Transparency: M14 |

**STANDARD IV:** Students will understand the scale of size, distance between objects, movement, and apparent motion (due to Earth’s rotation) of objects in the universe and how cultures have understood, related to and used these objects in the night sky.

**Objective 1:** Compare the size and distance of objects within systems in the universe.

| a. Use the speed of light as a measuring standard to describe the relative distances to objects in the universe (e.g., 4.4 light years to star Alpha Centauri; 0.00002 light years to the sun). | **Astronomy**  
SE/TE: 130-133, 146, 147, 150  
TE: 149  
TR: All In One Teaching Resources: 259, 263, 281  
TECH: Transparency: J40  
**Sound and Light**  
SE/TE: 14, 72  
TECH: Student Express CD-ROM;  
www.PHSchool.com/cgd-5012 |
| b. Compare distances between objects in the solar system. | **Astronomy**  
SE/TE: 85, 95, 102-103, 130-131, 134-135  
TR: All In One Teaching Resources: 201, 202-204, 231, 263, 267-269; Guided Reading and Study Workbook: 58  
TECH: Discovery Channel School Video-The Solar System; Student Express CD-ROM;  
www.PHSchool.com/ced-5034;  
www.SciLinks.org/scn-0633 |
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| c. Compare the size of the Solar System to the size of the Milky Way galaxy. | Astronomy  
SE/TE: 141, 144-145, 146-147  
TR: Guided Reading and Study Workbook: 64-65  
TECH: www.SciLinks.org/scn-0644; Transparency: J44 |
| d. Compare the size of the Milky Way galaxy to the size of the known universe. | Astronomy  
SE/TE: 144-145, 146-147, 150, 152  
TE: 116J  
TR: All In One Teaching Resources: 283  
TECH: Discovery Channel School Video-Stars, Galaxies And The Universe; www.SciLinks.org/scn-0644, scn-0645 |

**Objective 2:** Describe the appearance and apparent motion of groups of stars in the night sky relative to Earth and how various cultures have understood and used them.

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| a. Locate and identify stars that are grouped in patterns in the night sky. | Astronomy  
SE/TE: 116-117, 123, 124, 126-133, 136-140, 141-147; Appendix-Star Charts  
TR: All In One Teaching Resources: 242-248, 259-265, 271-275, 278-282  
TECH: Discovery Channel School Video-Stars, Galaxies And The Universe; Transparencies: J49, J50, J51, J52  
**Sound and Light**  
SE/TE: 129-130 |
| b. Identify ways people have historically grouped stars in the night sky. | Astronomy  
SE/TE: 6, 73-77, 126, 141  
TR: All In One Teaching Resources: 173-177; Guided Reading and Study Workbook: 33-35 |
| c. Recognize that stars in a constellation are not all the same distance from Earth. | Astronomy  
SE/TE: 126, 127, 130-131, 132-133, 134-135, 142-143  
TR: All In One Teaching Resources: 263-264, 267-269  
TECH: Discovery Channel School Video-Stars, Galaxies And The Universe |
| d. Relate the seasonal change in the appearance of the night sky to Earth’s position. | Astronomy  
SE/TE: 7-9, 10-11, 12-13, 14-15  
TE: Address Misconceptions: 12  
TR: All In One Teaching Resources: 46, 48-49, 50, 51, 52-54; Guided Reading and Study Workbook: 9-11  
TECH: Discovery Channel School Video-Earth, Moon, and Sun; Student Express CD-ROM; www.PHSchool.com/cfp-5012; Transparencies: J2, J3, J49, J50, J51, J52 |
| e. Describe ways that familiar groups of stars may be used for navigation and calendars. | Astronomy  
SE/TE: 6, 8-9, 72, 73-77, 126, 131; Appendix-Star Charts |

**SE = Student Edition TE = Teacher Edition TR = Teaching Resource TECH = Technology**
Objective 1: Observe and summarize information about microorganisms.

a. Examine and illustrate size, shape, and structure of organisms found in an environment such as pond water.

From Bacteria To Plants
SE/TE: 4-5, 6, 7-9, 15, 16-19, 26-28, 30, 31, 74, 75-83, 84-86, 88-89
TE: 4G, 4H, 49, 50, 72F, 74, 82
TR: All In One Teaching Resources: 38-44, 47-51, 53-54, 56, 57-59, 67-68, 73, 164-168, 191-195

b. Compare characteristics common in observed organisms (e.g., color, movement, appendages, shape) and infer their function (e.g., green color found in organisms that are producers, appendages help movement).

From Bacteria To Plants
SE/TE: 4-5, 6, 7-9, 16, 17-24, 25, 26-29, 50-51, 75-83, 91, 108-110, 158-159
TE: 4G, 4H, 50

c. Research and report on a microorganism’s requirements (i.e., food, water, air, waste disposal, temperature of environment, reproduction).

From Bacteria To Plants
SE/TE: 12-14, 15, 50-53, 72-73, 75-83, 88-91
TR: All In One Teaching Resources: 52, 53-54, 118, 119-120, 123, 156-162, 164, 180-183
TECH: Discovery Channel School Video: Protists and Fungi; Student Express CD-ROM; www.PHSchool.com/cep-1031
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| Objective 2: Demonstrate the skills needed to plan and conduct an experiment to determine a microorganism’s requirements in a specific environment. | **From Bacteria To Plants**  
TE: 53, 93  
TR: All In One Teaching Resources: 38-44, 53-54, 100-106, 124-126, 156-162, 177-178, 186-188 |
| a. Formulate a question about microorganisms that can be answered with a student experiment. | **From Bacteria To Plants**  
TE: 53, 93  
TR: All In One Teaching Resources: 38-44, 53-54, 100-106, 124-126, 156-162, 177-178, 186-188 |
| b. Develop a hypothesis for a question about microorganisms based on observations and prior knowledge. | **From Bacteria To Plants**  
TE: 53, 93  
TR: All In One Teaching Resources: 38-44, 53-54, 100-106, 124-126, 156-162, 177-178, 186-188 |
| c. Plan and carry out an investigation on microorganisms. {Note: Teacher must examine plans and procedures to assure the safety of students; for additional information, you may wish to read microbe safety information on Utah Science Home Page.} | **From Bacteria To Plants**  
SE/TE: 48, 58-59, 60, 72-73, 80, 84, 87, 96-97  
TE: 53, 56  
TR: All In One Teaching Resources: 22-31, 124-126, 156-162, 177-178, 186-188 |
| d. Display results in an appropriate format (e.g., graphs, tables, diagrams). | **From Bacteria To Plants**  
TR: All In One Teaching Resources: 53-54, 100-102, 177-178, 186-188  
TR: All In One Teaching Resources: 272-278, 319-320 |
| e. Prepare a written summary or conclusion to describe the results in terms of the hypothesis for the investigation on microorganisms. | **From Bacteria To Plants**  
SE/TE: 15, 36, 38-39, 47, 70, 80, 96-97, 100, 111, 158-159  
TR: All In One Teaching Resources: 53-54, 100-106, 115-116, 186-188, 302-304 |

Objective 3: Identify positive and negative effects of microorganisms and how science has developed positive uses for some microorganisms and overcome the negative effects of others.

| a. Describe in writing how microorganisms serve as decomposers in the environment. | **From Bacteria To Plants**  
SE/TE: 56, 86, 92  
TE: 92-93 |
| b. Identify how microorganisms are used as food or in the production of food (e.g., yeast helps bread rise, fungi flavor cheese, algae are used in ice cream, bacteria are used to make cheese and yogurt). | **From Bacteria To Plants**  
SE/TE: 12, 27, 48, 50-51, 55, 91, 92, 119, 156, 157, 165-167  
TECH: www.SciLinks.org/scn-0155  
Motion, Forces, and Energy  
SE/TE: 159  
The Nature of Science and Technology  
SE/TE: 33 |
c. Identify helpful uses of microorganisms (e.g., clean up oil spills, purify water, digest food in digestive tract, antibiotics) and the role of science in the development of understanding that led to positive uses (i.e., Pasteur established the existence, growth, and control of bacteria; Fleming isolated and developed penicillin).

From Bacteria To Plants
TR: All In One Teaching Resources: 38-44, 53-54, 177-178, 232-234, 302-304, 319-321

Astronomy
SE/TE: 108-111
Motion, Forces, and Energy
SE/TE: 18-21, 158, 166-169
TR: Guided Reading and Study Workbook: 62-64
TECH: www.SciLinks.org/scn-1354

d. Relate several diseases caused by microorganisms to the organism causing the disease (e.g., athlete’s foot - fungi, streptococcus throat - bacteria, giardia - protozoa).

From Bacteria To Plants
SE/TE: x-3, 40, 41-46, 60, 61, 62-63, 64, 65, 66-67
TE: 27
TECH: Student Express CD-ROM;
www.PHSchool.com/cep-1021, ceh-1020;

e. Observe and report on microorganisms’ harmful effects on food (e.g., causes fruits and vegetables to rot, destroys food bearing plants, makes milk sour).

From Bacteria To Plants
SE/TE: 61, 62, 63, 65, 82, 83, 90, 91, 93
TR: All In One Teaching Resources: 137-141, 153-154
TECH: Discovery Channel School Video-Viruses and Bacteria; www.SciLinks.org/scn-0123

Benchmark: Heat, light, and sound are all forms of energy. Heat can be transferred by radiation, conduction and convection. Visible light can be produced, reflected, refracted, and separated into light of various colors. Sound is created by vibration and cannot travel through a vacuum. Pitch is determined by the vibration rate of the sound source.

STANDARD VI: Students will understand properties and behavior of heat, light, and sound.
Objective 1: Investigate the movement of heat between objects by conduction, convection, and radiation.

a. Compare materials that conduct heat to materials that insulate the transfer of heat energy.

Motion, Forces, and Energy
SE/TE: 174-175, 180-181, 183, 184-187, 188-189, 190
TE: 174G-174H, 180
TR: All In One Teaching Resources: 358-364, 381-383; Guided Reading and Study Workbook: 68-70
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<td>c. Describe the movement of heat across space from the sun to Earth by radiation.</td>
<td><strong>Astronomy</strong>&lt;br&gt;SE/TE: x-3, 10, 14-15, 119, 150&lt;br&gt;TE: 80&lt;br&gt;TR: All In One Teaching Resources: 52-54&lt;br&gt;Motion, Forces, and Energy&lt;br&gt;SE/TE: 184-185&lt;br&gt;Sound and Light&lt;br&gt;SE/TE: 71, 77</td>
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<td>d. Observe and describe, with the use of models, heat energy being transferred through a fluid medium (liquid and/or gas) by convection currents.</td>
<td><strong>Motion, Forces, and Energy</strong>&lt;br&gt;SE/TE: 183, 184, 186, 188-189, 190, 191, 192-194&lt;br&gt;TE: 185&lt;br&gt;TR: All In One Teaching Resources: 375-379, 380, 381-383, 385-390, 391; Guided Reading and Study Workbook: 71-74&lt;br&gt;TECH: Discovery Channel School Video-Thermal Energy and Heat; <a href="http://www.SciLinks.org/scn-1363">www.SciLinks.org/scn-1363</a>; Transparency: M55</td>
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<td>e. Design and conduct an investigation on the movement of heat energy.</td>
<td><strong>Motion, Forces, and Energy</strong>&lt;br&gt;SE/TE: 174-175, 176, 182, 183, 184, 188-189, 190, 193, 195,196&lt;br&gt;TE: 179, 185, 192&lt;br&gt;TR: All In One Teaching Resources: 358-364, 372-373, 380, 381-383</td>
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| **Objective 2:** Describe how light can be produced, reflected, refracted, and separated into visible light of various colors. | **From Bacteria To Plants**  
SE/TE: 114-117, 161, 162  
TR: All In One Teaching Resources: 226-228, 230;  
Guided Reading and Study Workbook: 48-49  
TECH: Transparencies: A30, A31  

**Astronomy**  
SE/TE: 119, 120-121, 124, 127, 128-129  
TE: 120, 122  
TR: All In One Teaching Resources: 252, 255  
TECH: Transparency: J35  

**Sound and Light**  
SE/TE: 19, 72-73, 74, 75, 78, 81, 84-85, 86, 87, 88-89, 106-111, 114-118, 120-121, 132  
TE: 104H, 104I, 104J  
TR: All In One Teaching Resources: 62-67, 68, 184, 188, 191, 193, 197-200, 202-203, 216-220, 246-250, 251, 252-253, 279  
TECH: Discovery Channel School Video- Light;  
Transparencies: O31, O32, O35, O39 |
| **a.** Compare light from various sources (e.g., intensity, direction, color). |  
From Bacteria To Plants  
SE/TE: 114-117, 161, 162  
TR: All In One Teaching Resources: 226-228, 230;  
Guided Reading and Study Workbook: 48-49  
TECH: Transparencies: A30, A31  

**Astronomy**  
SE/TE: 119, 120-121, 124, 127, 128-129  
TE: 120, 122  
TR: All In One Teaching Resources: 252, 255  
TECH: Transparency: J35  

**Sound and Light**  
SE/TE: 17, 18, 113-118, 130, 136  
TE: 104I  
TR: All In One Teaching Resources: 62, 255-259;  
Guided Reading and Study Workbook: 54-56  
TECH: Transparencies: O9, O43, O54 |
<p>| <strong>b.</strong> Compare the reflection of light from various surfaces (e.g., loss of light, angle of reflection, reflected color). |</p>
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| c. Investigate and describe the refraction of light passing through various materials (e.g., prisms, water). | From Bacteria To Plants  
SE/TE: 114-117, 161, 162  
TR: All In One Teaching Resources: 226-228, 230;  
Guided Reading and Study Workbook: 48-49  
TECH: Transparencies: A30, A31  
Astronomy  
SE/TE: 119, 120-121, 124, 127, 128-129  
TE: 120, 122  
TR: All In One Teaching Resources: 252, 255  
TECH: Transparency: J35  
Sound and Light  
SE/TE: 19, 78, 119-121  
TE: 104I  
TR: All In One Teaching Resources: 62-63, 184, 262-266, 267; Guided Reading and Study  
Workbook: 57-59  
TECH: Transparency: O10 |
| d. Predict and test the behavior of light interacting with various fluids (e.g., light transmission through fluids, refraction of light). | From Bacteria To Plants  
SE/TE: 114  
TE: 115  
Sound and Light  
SE/TE: 18, 19, 72, 73 |
| e. Predict and test the appearance of various materials when light of different colors is shone on the material. | From Bacteria To Plants  
SE/TE: 114  
TE: 115  
Astronomy  
TE: 120, 122  
Sound and Light  
SE/TE: 112  
TR: All In One Teaching Resources: 201, 251, 252-253, 293-295; Guided Reading and Study  
Workbook: 52-53  
TECH: Transparencies: O39, O40, O41 |

**Objective 3:** Describe the production of sound in terms of vibration of objects that create vibrations in other materials.

| | |
| a. Describe how sound is made from vibration and moves in all directions from the source in waves. | Sound and Light  
SE/TE: 7-9, 36-41, 42-47, 48-49  
TE: 4G, 4H, 34H, 34I  
TR: All In One Teaching Resources: 46-50, 112-116, 119-124, 126  
TECH: Student Express CD-ROM;  
www.PHSchool.com/cgd-5022;  
www.SciLinks.org/scn-1511, scn-1521;  
Transparencies: O16, O17, O18 |
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| b. Explain the relationship of the size and shape of a vibrating object to the pitch of the sound produced. | **Sound and Light**  
SE/TE: 36, 37, 44-45, 46-47, 48, 50-51, 53  
TE: 34I-34J  
TR: All In One Teaching Resources: 119, 121, 126-130, 131, 132-134  
TECH: SciLinks.org/scn-1521; Transparency: O23 |
| c. Relate the volume of a sound to the amount of energy used to create the vibration of the object producing the sound. | **Sound and Light**  
SE/TE: 36, 37, 40, 42-44, 47, 91  
TE: 34I  
TR: All In One Teaching Resources: 119-121, 124  
TECH: SciLinks.org/scn-1521; Transparency: O20 |
| d. Make a musical instrument and report on how it produces sound. | **Sound and Light**  
SE/TE: 34-35, 44-45, 48-52  
TE: 34I-34J  
TR: All In One Teaching Resources: 104-110, 131, 132-134 |