<table>
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<tr>
<th>STANDARDS</th>
<th>PAGE REFERENCES</th>
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<tbody>
<tr>
<td>1. The Nature of Science and Engineering</td>
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<tr>
<td>1. The Practice of Science</td>
<td></td>
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<tr>
<td>1. Scientists work as individuals and in groups, emphasizing evidence, open communication and skepticism.</td>
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3.1.1.1 Provide evidence to support claims other than saying “Everyone knows that,” or “I just know,” and question such reasons when given by others.

**Student Edition:**
- *Explore More* 31
- *Quick Lab* 35, 231, 243, 447, 481
- *Explore* 69, 119, 133, 203, 213, 279, 407
- *Focus on Skills* 78-79, 460-461
- *Be a Scientist* 268-269, 334-335

**Teacher’s Edition:**
- AE 53, 383; GI 21
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<tr>
<td>2. Scientific inquiry is a set of interrelated processes incorporating multiple approaches that are used to pose questions about the natural world and investigate phenomena.</td>
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</table>
| 3.1.1.2.1 Generate questions that can be answered when scientific knowledge is combined with knowledge gained from one's own observations or investigations. For example: Investigate the sounds produced by striking various objects. | Student Edition:  
*Explore* 21, 69, 81, 107, 119, 213, 259, 317, 327, 383, 443, 489  
*Writing Link* 77  
*Focus on Skills* 78-79, 246-247, 486-487  
*Be a Scientist* 144-145, 268-269, 422-423, 450-451, 496-497  
Teacher's Edition:  
AE 31, 43, 91, 119, 161, 203, 239, 279, 397, 463, 511                                                                                      |
| 3.1.1.2.2 Recognize that when a science investigation is done the way it was done before, even in a different place, a similar result is expected.                                                                 | Student Edition:  
*Test Your Hypothesis* 7  
Teacher's Edition:  
IW 246; SB 4                                                                                                                                        |
| 3.1.1.2.3 Maintain a record of observations, procedures and explanations, being careful to distinguish between actual observations and ideas about what was observed. For example: Make a chart comparing observations about the structures of plants and animals. | Student Edition:  
*Explore* 21, 43, 69, 191, 227, 363, 397, 407, 453  
*Focus on Skills* 78-79, 116-117, 246-247, 286-287, 404-405, 460-461  
*Explore More* 107  
*Be a Scientist* 144-145, 268-269, 450-451  
Teacher's Edition:  
AE 69, 383; IM 78                                                                                                                        |
| 3.1.1.2.4 Construct reasonable explanations based on evidence collected from observations or experiments.                                                                                                                                                   | Student Edition:  
*Explore* 21, 31, 43, 69, 107, 119, 203, 213, 317, 443, 479  
*Quick Lab* 35, 55, 114, 217, 243, 259, 481  
*Focus on Skills* 78-79, 116-117, 246-247, 404-405, 460-461, 486-487  
*Be a Scientist* 144-145, 268-269, 334-335, 450-451, 496-497  
Teacher's Edition:  
AE 119, 173, 203, 213, 239, 259, 383, 443                                                                                     |
### 3. Interactions Among Science, Technology Engineering, Mathematics, and Society

#### 2. Men and women throughout the history of all cultures, including Minnesota American Indian tribes and communities, have been involved in engineering design and scientific inquiry.

**3.1.3.2.1 Understand that everybody can use evidence to learn about the natural world, identify patterns in nature, and develop tools.**

*For example:* Ojibwe and Dakota knowledge and use of patterns in the stars to predict and plan.

**Student Edition:**
- 284
- *Be a Scientist* 2-11
- *Reading in Science* 96-97, 130-131, 300-301, 352-353, 370-371, 440-441
- *Art Link* 285

**Teacher’s Edition:**
- DMI 5, 8, 10; ELL 2; HA 284; IW 310

**3.1.3.2.2 Recognize that the practice of science and/or engineering involves many different kinds of work and engages men and women of all ages and backgrounds.**

**Student Edition:**
- *Be a Scientist* 2-11
- *Reading in Science* 96-97, 130-131, 300-301, 352-353, 370-371, 440-441
- *Careers in Science* 100, 184, 272, 356, 522
- *Literature* 186-187

**Teacher’s Edition:**
- CE 83; IW 100, 184, 272, 356, 522; LAI 100; SB 6, 9, 290, 444; WAI 100, 184, 272, 356, 522

### 4. Tools and mathematics help scientists and engineers see more, measure more accurately, and do things that they could not otherwise accomplish.

**3.1.3.4.1 Use tools, including rulers, thermometers, magnifiers and simple balances, to improve observations and keep a record of the observations made.**

**Student Edition:**
- *Quick Lab* 26, 127, 231, 243, 339, 377
- *Be a Scientist* 40-41, 268-269, 422-423, 450-451
- *Apply It* 287
- *Math Link* 379
- *Focus on Skills* 380-381

**Teacher’s Edition:**
- AE 21, 31, 161, 227, 239, 373; DI 375
### 2. Physical Science

#### 3. Energy

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<tr>
<td>1. Energy appears in different forms, including sound and light.</td>
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</table>
| 3.2.3.1.1 Explain the relationship between the pitch of a sound, the rate of vibration of the source and factors that affect pitch. For example: Changing the length of a string that is plucked changes the pitch. | *Student Edition:* 490-495  
*Quick Lab* 493  
*Music Link* 495  
*Teacher's Edition:* OI 489 |
| 3.2.3.1.2 Explain how shadows form and can change in various ways.       | *Student Edition:* 318, 502  
*Look and Wonder* 316  
*Explore* 317  
*Art Link* 507  
*Teacher's Edition:* AE 317; OI 317 |
| 3.2.3.1.3 Describe how light travels in a straight line until it is absorbed, redirected, reflected or allowed to pass through an object. For example: Use a flashlight, mirrors and water to demonstrate reflection and bending of light. | *Student Edition:* 500-507  
*Explore* 499  
*Teacher's Edition:* AE 499; DI 503; DMI 500, 502; EMI 501; OI 499; WU 498 |

### 3. Earth and Space Science

#### 3. The Universe

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<tr>
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<tbody>
<tr>
<td>1. The sun and moon have locations and movements that can be observed and described.</td>
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</tbody>
</table>
| 3.3.3.1.1 Observe and describe the daily and seasonal changes in the position of the sun and compare observations. | *Student Edition:* 318  
*Explore* 317  
*Teacher's Edition:* VA 314D |
3.3.3.1.2 Recognize the pattern of apparent changes in the moon’s shape and position.

**Student Edition:**
328-331
*Look and Wonder* 326
*Explore* 327
*Quick Lab* 331
*Lesson Review* 333
*Be a Scientist* 334-335

**Teacher’s Edition:**
AE 327; DI 329; DMI 328, 330; ELL 331; FA 333;
IW 335; OI 327; UTV 329, 330

2. Objects in the solar system as seen from Earth have various sizes and distinctive patterns of motion.

3.3.3.2.1 Demonstrate how a large light source at a great distance looks like a small light that is much closer.  
*For example:* Car headlights at a distance look small compared to when they are close.

**Student Edition:**
339, 348
*Quick Lab* 339
*Look and Wonder* 346

**Teacher’s Edition:**
AE 347; AM 322

3.3.3.2.2 Recognize that the Earth is one of several planets that orbit the sun, and that the moon orbits the Earth.

**Student Edition:**
328, 338-343
*Explore* 337
*Focus on Skills* 344-345

**Teacher’s Edition:**
AE 337; DI 339; DMI 338, 340; ELL 341; FA 333, 343; HA 342; OI 337; SB 328; UTV 340; WU 336

4. Life Science

1. Structure and Function in Living Systems

1. Living things are diverse with many different characteristics that enable them to grow, reproduce and survive.

3.4.1.1.1 Compare how the different structures of plants and animals serve various functions of growth, survival and reproduction.  
*For example:* Skeletons in animals and stems in plants provide strength and stability.

**Student Edition:**
32-39, 44-49
*Explore* 31, 43
*Quick Lab* 35, 47

**Teacher’s Edition:**
AE 31; DI 35, 37, 47; DMI 32, 34, 36, 45; DV 34;
ELL 34; FA 39, 49; UTV 36
### 3. Evolution in Living Systems

#### 2. Offspring are generally similar to their parents, but may have variations that can be advantageous or disadvantageous in a particular environment.

**2.4.3.2.1** Give examples of likenesses between adults and offspring in plants and animals that can be inherited or acquired.

*For example:* Collect samples or pictures that show similarities between adults and their young offspring.

**Student Edition:**
- 92-95
- *Look and Wonder* 90
- *Explore* 91
- *Quick Lab* 93
- *Social Studies Link* 95

**Teacher’s Edition:**
- AE 91; ELL 93; EMI 94; FA 95; HA 94; OI 91;
- UTV 92; WU 80, 90

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**2.4.3.2.2** Give examples of differences among individuals that can sometimes give an individual an advantage in survival and reproduction.

**Student Edition:**
- 134-143
- *Explore* 133
- *Quick Lab* 137
- *Be a Scientist* 144-145

**Teacher’s Edition:**
- AE 133; ELL 139, 141; EMI 141; FA 143; IW 145;
- OI 133; SB 134; WU 132