

## Overview of Science Units & Major Resources: GRADE 2

### **Unit 1: Earth and Space Science – Weather**

- Grade 2 Harcourt Science

### **Unit 2: Physical Science – Matter and Motion**

- Grade 2 Harcourt Science

### **Unit 3: Life Science – Plants**

- Grade 2 Harcourt Science

*\* See Science Curriculum Frameworks for more detailed information.*

*\* See grade level district shared folder for additional resources.*

## GRADE 2: SCIENCE CURRICULUM FRAMEWORKS

UNIT 1: EARTH AND SPACE SCIENCE – WEATHER				
Big Questions		Formative/Summative Assessments (To be determined by teachers/teams)		
<ol style="list-style-type: none"> <li>1. How does weather change?</li> <li>2. How do we measure weather conditions?</li> <li>3. How can clouds help us predict the weather?</li> <li>4. How can we prepare for the weather?</li> <li>5. How do products that we use help us in our everyday lives?</li> <li>6. What is the water cycle?</li> </ol>		Options include, but are not limited to: <ul style="list-style-type: none"> <li>• Grade 2 Harcourt Science Unit D, Chapter 2 Assessment</li> </ul>		
Substrand/Standard	Curriculum Benchmark	Standards of Proficiency (To be determined by teachers/teams)	Resources	Optional Ideas for Engineering Connections
<p><u>Substrand:</u> Interdependence Within the Earth System</p> <p><u>Standard:</u> Understand that weather can be described in measurable quantities and changes from day to day and with the seasons.</p>	Measure, record, and describe weather conditions using common tools. (For example: Temperature, precipitation, sunrise/sunset, and wind speed/direction.) <i>(Standard ESS: 2.3.2.2.1)</i>		Grade 2 Harcourt Science: <ul style="list-style-type: none"> <li>• Unit D, Chapter 2, Lesson 1, pp. D36-D41</li> <li>• Unit D, Chapter 2, Lesson 2, pp. D42-D45</li> <li>• Unit D, Chapter 2, Lesson 3, pp. D46-D51</li> <li>• Unit D, Chapter 2, Lesson 4, pp. D52-D57</li> </ul>	Have your students design and build a simple solar cooker. Measure the temperature in the shade, in the sun and in your solar cooker. Oven thermometers are handy here. Can you melt a piece of chocolate? Can you melt a marshmallow? Make a s'more in your solar cooker. Have your students design and construct a machine to show wind speed or wind direction. Or make a machine that uses the power of the wind to do something (sail a boat, lift a weight, spin a pinwheel). <i>(from "The Works"*)</i>
<p><u>Substrand:</u> The Practice of Engineering</p> <p><u>Standard:</u> Understand that engineering design is the process of identifying a problem and devising a product or process to solve the problem.</p>	<p><b>Identify a need or a problem and construct an object that helps to meet the need or solve the problem. (For example: Design and build a tool to show wind direction; or design a kite and identify material to use.)</b> <i>(Standard NSE: 2.1.2.2.1)</i></p>		Grade 2 Harcourt Science: <ul style="list-style-type: none"> <li>• Unit D, Chapter 2, Lesson 3, page D49</li> </ul>	Engage your students with a real engineering challenge! Here are some examples to try: <ul style="list-style-type: none"> <li>• Design and build a box to hold valentines</li> <li>• Make a car with rolling wheels.</li> <li>• Build a model bridge, house or skyscraper.</li> </ul> <i>(from "The Works"*)</i> <p>Integrating engineering: Explore how problems were solved in other cultures or other times. Communicate your design in writing and speaking. <i>(from "The Works"*)</i></p> <p>Make a weather station.</p>

## GRADE 2: SCIENCE CURRICULUM FRAMEWORKS

<b>UNIT 1: EARTH AND SPACE SCIENCE – WEATHER</b> (continued)				
Substrand/Standard	Curriculum Benchmark	Standards of Proficiency (To be determined by teachers/teams)	Resources	Optional Ideas for Engineering Connections
<p><u>Substrand:</u> The Practice of Engineering</p> <p><u>Standard:</u> Understand that engineering design is the process of identifying a problem and devising a product or process to solve the problem.</p>	<p><b>Explain how engineered or designed items from everyday life benefit people.</b> (<i>Standard NSE: 2.1.2.2.3</i>)</p>		<p>Grade 2 Harcourt Science:</p> <ul style="list-style-type: none"> <li>• Unit D, Chapter 2, Lesson 4, page D53</li> </ul>	<p>A good question to ask: What did people do before this or that was invented? Before light bulbs, cars, computers, television, zippers? (<i>from "The Works"*</i>)</p> <p>Create 2 emergency kits for different types of weather disasters (example: 1 kit for tornadoes and 1 kit for a flood).</p>

\* "The Works" <http://www.theworks.org/>

## GRADE 2: SCIENCE CURRICULUM FRAMEWORKS

UNIT 2: PHYSICAL SCIENCE – MATTER AND MOTION				
Big Questions		Formative/Summative Assessments (To be determined by teachers/teams)		
<ol style="list-style-type: none"> <li>1. What is matter?</li> <li>2. What are properties of matter?</li> <li>3. How can matter be changed?</li> <li>4. What are forces?</li> <li>5. How do magnets work?</li> <li>6. How do we measure motion?</li> <li>7. When we make something, why are some materials better than others?</li> <li>8. How do the products that we use help us in our everyday lives?</li> </ol>		Options include, but are not limited to: <ul style="list-style-type: none"> <li>• Grade 2 Harcourt Science Unit E, Chapter 1 Assessment</li> <li>• Grade 2 Harcourt Science Unit E, Chapter 2 Assessment</li> <li>• Grade 2 Harcourt Science Unit F, Chapter 1 Assessment</li> </ul>		
Substrand/Standard	Curriculum Benchmark	Standards of Proficiency (To be determined by teachers/teams)	Resources	Optional Ideas for Engineering Connections
<u>Substrand:</u> Matter <u>Standard:</u> Understand that objects can be described in terms of the materials they are made of and their physical properties.	Describe objects in terms of color, size, shape, weight, texture, flexibility, strength, and types of material in the object. <i>(Standard PS: 2.2.1.1.1)</i>		Grade 2 Harcourt Science: <ul style="list-style-type: none"> <li>• Unit E, Chapter 1, Lesson 1, pp. E4-E7</li> <li>• Unit E, Chapter 1, Lesson 2, pp. E8-E13</li> <li>• Unit E, Chapter 1, Lesson 3, pp. E14-E19</li> <li>• Unit E, Chapter 1, Lesson 3, pp. E20-E25</li> </ul>	Explore other physical properties, too: What kind of things can you pick up with a magnet? What kinds of things conduct electricity? Which things sink and which things float? <i>(from “The Works”*)</i>
<u>Substrand:</u> Matter <u>Standard:</u> Understand that the physical properties of materials can be changed, but not all materials respond the same way to what is done to them.	Observe, record, and recognize that water can be a liquid or a solid and can change from one state to another. <i>(Standard PS: 2.2.1.2.1)</i>			

## GRADE 2: SCIENCE CURRICULUM FRAMEWORKS

UNIT 2: PHYSICAL SCIENCE – MATTER AND MOTION (continued)				
Substrand/Standard	Curriculum Benchmark	Standards of Proficiency (To be determined by teachers/teams)	Resources	Optional Ideas for Engineering Connections
<p><u>Substrand:</u> The Practice of Engineering <u>Standard:</u> Understand that engineering design is the process of identifying a problem and devising a product or process to solve the problem.</p>	<p><b>Describe why some materials are better than others for making a particular object and how materials that are better in some ways may not be better in other ways. (For example: Objects made of plastic, paper or glass.)</b> <i>(Standard NSE: 2.1.2.2.2)</i></p>		<ul style="list-style-type: none"> <li>• Book: <u>The Three Little Pigs</u> by James Marshall (copy in media center) S               <ul style="list-style-type: none"> <li>- See accompanying lesson plan in the district 2<sup>nd</sup> grade shared folder.</li> </ul> </li> </ul>	<p>You'd want to build a roof from a material that repels water, such as straw or stone. You'd want to build a wall of something sturdy that keeps cold out and warmth in. You'd want to make a basket out of something strong and lightweight. <i>(from "The Works"*)</i></p> <p>Egg Drop Challenge: What materials would you use to package an egg to protect it from a fall of a few feet or a few stories? Offer your students materials like bubble wrap, paper, coffee filters and cardboard, and see what they come up with. (Tip: put the eggs in plastic bags before distributing them to students!) <i>(from "The Works"*)</i></p>
<p><u>Substrand:</u> Motion <u>Standard:</u> Understand that the motion of an object can be described by a change in its position over time.</p>	<p>Describe an object's change in position relative to other objects or a background. (For example: Forward, backward, going up, going down.) <i>(Standard PS: 2.2.2.1.1)</i></p>		<p>Grade 2 Harcourt Science:</p> <ul style="list-style-type: none"> <li>• Unit F, Chapter 1, Lesson 3, pp. F18-F25</li> </ul>	

## GRADE 2: SCIENCE CURRICULUM FRAMEWORKS

UNIT 2: PHYSICAL SCIENCE – MATTER AND MOTION (continued)				
Substrand/Standard	Curriculum Benchmark	Standards of Proficiency (To be determined by teachers/teams)	Resources	Optional Ideas for Engineering Connections
<p><u>Substrand:</u> Motion <u>Standard:</u> Understand that the motion of an object can be described by a change in its position over time.</p>	<p>Demonstrate that objects move in a variety of ways, including a straight line, a curve, a circle, back and forth, and at different speeds. (For example: Spinning toy and rocking toy; or construct objects that will move in a straight line or a curve such as a marble or toy car on a track.) <i>(Standard PS: 2.2.2.1.2)</i></p>		<p>Grade 2 Harcourt Science: • Unit F, Chapter 1, Lesson 1, pp. F4-F11</p>	<p>Other ideas include:</p> <p>Marble run: Second graders often enjoy making marble runs. Find materials such as paper towel tubes and cardboard, and make a track that takes a marble at least one minute to run. <i>(from “The Works”*)</i></p> <p>Catapult: Have your students use clothespins, rubber bands and other materials to design and build a machine that shoots marshmallows. Does the marshmallow move in a straight line or a circle or a curve? <i>(from “The Works”*)</i></p> <p>Paper airplane: Have your students make paper airplanes. Throw them. Do they move in a straight line, a circle or a curve? <i>(from “The Works”*)</i></p>
<p><u>Substrand:</u> Motion <u>Standard:</u> Understand that the motion of an object can be changed by push or pull forces.</p>	<p>Describe how push and pull forces can make objects move. (For example: Push and pull objects on smooth and rough surfaces.) <i>(Standard PS: 2.2.2.2.1)</i></p>		<p>Grade 2 Harcourt Science: • Unit F, Chapter 1, Lesson 2, pp. F12-F17.</p>	<p>Cars and Ramps: Have your students make a car that rolls down a ramp. What is pulling the car? (Gravity.) Try out different surfaces for the ramp: smooth foil paper, a strip of carpet or other materials. This is also a good project for practicing measurement. Use a large piece of foam core for a ramp and let the students see how far a car will go when the ramp at steep angle versus a shallow one. <i>(from “The Works”*)</i></p>

## GRADE 2: SCIENCE CURRICULUM FRAMEWORKS

<b>UNIT 2: PHYSICAL SCIENCE – MATTER AND MOTION</b> (continued)				
Substrand/Standard	Curriculum Benchmark	Standards of Proficiency (To be determined by teachers/teams)	Resources	Optional Ideas for Engineering Connections
<p><u>Substrand:</u> Motion <u>Standard:</u> Understand that the motion of an object can be changed by push or pull forces.</p>	<p>Describe how things near Earth fall to the ground unless something holds them up. <i>(Standard PS: 2.2.2.2.2)</i></p>		<p>Grade 2 Harcourt Science:</p> <ul style="list-style-type: none"> <li>• Unit F, Chapter 1, Lesson 3, pp. F11, F18-F24</li> </ul>	
<p><u>Substrand:</u> The Practice of Engineering <u>Standard:</u> Understand that engineering design is the process of identifying a problem and devising a product or process to solve the problem.</p>	<p><b>Explain how engineered or designed items from everyday life benefit people.</b> <i>(Standard NSE: 2.1.2.2.3)</i></p>		<p>Grade 2 Harcourt Science:</p> <ul style="list-style-type: none"> <li>• Unit F, Chapter 1, Lesson 1, pp. F6 (with can opener, egg beater)</li> </ul>	<p>A good question to ask: What did people do before this or that was invented? Before light bulbs, cars, computers, television, zippers? <i>(from "The Works"*)</i></p>

## GRADE 2: SCIENCE CURRICULUM FRAMEWORKS

### UNIT 3: LIFE SCIENCE – PLANTS

Big Questions		Formative/Summative Assessments (To be determined by teachers/teams)		
1. What are living and nonliving things? 2. What do plants need to live? 3. How do plants change during their life cycle? 4. How do we ask questions and make observations about nature? 5. How do products that we use help us in our everyday lives?		Options include, but are not limited to: <ul style="list-style-type: none"> <li>• Grade 2 Harcourt Science Unit A, Chapter 1 Assessment</li> </ul>		
Substrand/Standard	Curriculum Benchmark	Standards of Proficiency (To be determined by teachers/teams)	Resources	Optional Ideas for Engineering Connections
<u>Substrand:</u> Structure and Function in Living Systems <u>Standard:</u> Understand that living things are diverse with many different observable characteristics.	Describe and sort plants into groups in many ways, according to their physical characteristics and behaviors. <i>(Standard LS: 2.4.1.1.1)</i>		Grade 2 Harcourt Science: <ul style="list-style-type: none"> <li>• Unit A, Chapter 1, Lesson 1, “What are living and non-living things?” (pp. A4-A7)</li> <li>• Unit A, Chapter 3 (page 14 Activity)</li> </ul>	
<u>Substrand:</u> Interdependence among Living Systems <u>Standard:</u> Understand that natural systems have many components that interact to maintain the system.	Recognize that plants need space, water, nutrients and air, and that they fulfill these needs in different ways. <i>(Standard LS: 2.4.2.1.1)</i>		Grade 2 Harcourt Science: <ul style="list-style-type: none"> <li>• Unit A, Chapter 1, Lesson 2, pp. A8-A13                – Needs of Plants (page A9)</li> </ul>	With your students, learn about what plants need and then design and make a terrarium. <i>(from “The Works”*)</i>
<u>Substrand:</u> Evolution in Living Systems <u>Standard:</u> Understand that plants and animals undergo a series of orderly changes during their life cycles.	Describe the characteristics of plants at different stages of their life cycles. (For example: Use live organisms or pictures to observe the changes that occur during the life cycle of bean plants or marigolds.) <i>(Standard LS: 2.4.3.1.1)</i>		Grade 2 Harcourt Science: <ul style="list-style-type: none"> <li>• Unit A, Chapter 1, Lesson 3, pp. A14-A17</li> <li>• Unit A, Chapter 1, Lesson 2, pp. A10-A11</li> </ul>	



## GRADE 2: SCIENCE CURRICULUM FRAMEWORKS

### UNIT 3: LIFE SCIENCE – PLANTS (continued)

Substrand/Standard	Curriculum Benchmark	Standards of Proficiency (To be determined by teachers/teams)	Resources	Optional Ideas for Engineering Connections
<p><u>Substrand:</u> The Practice of Science</p> <p><u>Standard:</u> Understand that scientific inquiry is a set of interrelated processes incorporating multiple approaches that are used to pose questions about the natural world and investigate phenomena.</p>	<p><b>Raise questions about the natural world and seek answers by making careful observations, noting what happens when you interact with an object, and sharing the answers with others.</b></p> <p><i>(Standard NSE: 2.1.1.2.1)</i></p>		<p>Grade 2 Harcourt Science:</p> <ul style="list-style-type: none"> <li>• Unit A experiment (pages Ali- Alj)</li> </ul>	<p>Exploring properties of natural materials is important in engineering. It helps engineers determine the best way to use each object. For example, sharp stones can be used to cut, while long, flexible reeds can be used to weave baskets. <i>(from “The Works”*)</i></p>
<p><u>Substrand:</u> The Practice of Engineering</p> <p><u>Standard:</u> Understand that engineering design is the process of identifying a problem and devising a product or process to solve the problem.</p>	<p><b>Explain how engineered or designed items from everyday life benefit people.</b></p> <p><i>(Standard NSE: 2.1.2.2.3)</i></p>		<p>The Works: <a href="http://www.theworks.org/">http://www.theworks.org/</a></p>	<p>A good question to ask: What did people do before this or that was invented? Before light bulbs, cars, computers, television, zippers? <i>(from “The Works”*)</i></p> <p>Transporting Water – What did farmers use before irrigation devices, garden hoses, and shoulder yoke for pails?</p>