

## RAMP UP - HAB Lesson Plan

<b>Title of Lesson:</b>	Exploring Energy with Weather Balloons
<b>Grade Level:</b>	4th
<b>AL COS Standard:</b>	SC15.4.1 - Use evidence to explain the relationship of the speed of an object to the energy of that object.
<b>NGSS:</b>	4-PS3-1 – Use evidence to construct an explanation relating the speed of an object to the energy of that object.
<b>Learning Targets/Objectives:</b>	<p>Students will be able to:</p> <ul style="list-style-type: none"><li>● Articulate from evidence to explain the observable impact of the speed of an object and the energy of an object.</li></ul> <p>Students understand that:</p> <ul style="list-style-type: none"><li>● Energy can be transferred in various ways and between objects.</li></ul>
<b>Materials Needed:</b>	<ul style="list-style-type: none"><li>● <b>Book:</b><ul style="list-style-type: none"><li>○ <i>Oh, the Places You'll Go!</i> By Dr. Seuss<ul style="list-style-type: none"><li>▪ Link to purchase on Amazon: <a href="https://www.amazon.com/Oh-Places-You-ll-Dr-Seuss/dp/0679805273">https://www.amazon.com/Oh-Places-You-ll-Dr-Seuss/dp/0679805273</a></li><li>▪ Link to Read Aloud: <a href="https://www.youtube.com/watch?v=0bcx63SvbiU">https://www.youtube.com/watch?v=0bcx63SvbiU</a></li></ul></li></ul></li><li>● <b>Video:</b><ul style="list-style-type: none"><li>○ Helium 101 by National Geographic: <a href="https://www.youtube.com/watch?v=hLUcO26Q7wE&amp;t=173s">https://www.youtube.com/watch?v=hLUcO26Q7wE&amp;t=173s</a></li></ul></li><li>● <b>Worksheet</b><ul style="list-style-type: none"><li>○ Types of Energy: <a href="https://www.liveworksheets.com/w/en/natural-science/928092">https://www.liveworksheets.com/w/en/natural-science/928092</a></li></ul></li><li>● <b>Quiz for Evaluation</b></li></ul>

	<ul style="list-style-type: none"> <li>o Helium Lesson for Kids: Facts &amp; Uses - Quiz &amp; Worksheet:  <a href="https://study.com/academy/practice/helium-quiz-worksheet-for-kids.html">https://study.com/academy/practice/helium-quiz-worksheet-for-kids.html</a></li> <li>● <b>HAB RAMP UP Kit</b> <ul style="list-style-type: none"> <li>o All materials needed for the HAB experiment are included in the kit.</li> </ul> </li> </ul> <p>All links to videos, books, and worksheets can also be found on the HAB Kit Resources page <a href="https://uahrampup.org/hab/">https://uahrampup.org/hab/</a></p>
<b>Preparation:</b>	<ul style="list-style-type: none"> <li>● Fill out the Pre-Flight Checklist on the <a href="https://uahrampup.org">uahrampup.org</a> website</li> <li>● Locate an open space to do the experiment.</li> <li>● Make sure the area that you select is free of trees, powerlines, and no aircraft is flying</li> <li>● Check weather to make sure it is clear to do the experiment</li> <li>● Make sure you have allotted enough time to complete the experiment</li> </ul>
<b>Lesson Logistics:</b>	<ul style="list-style-type: none"> <li>● Make sure you have two to three people to help you with this experiment.</li> <li>● Have someone reading the instructions while the other two are assembling the balloon</li> <li>● Make sure space located is available</li> <li>● Make sure all materials are in place before starting experiment</li> <li>● Identify approximate completion time</li> </ul>
<b>Vocabulary Words:</b>	<ul style="list-style-type: none"> <li>● evidence</li> <li>● energy</li> <li>● explanation</li> <li>● relative speed</li> <li>● phenomenon</li> <li>● helium</li> <li>● construct</li> </ul>
<b>Safety Considerations:</b>	<ul style="list-style-type: none"> <li>● Make sure no one is allergic to latex</li> <li>● Make sure that the balloon does not touch the ground</li> <li>● Make sure all material that is needed is working properly</li> </ul>
<b>Engage:</b>	<ol style="list-style-type: none"> <li>1. Have students watch the video <i>Helium 101</i> by National Geographic.</li> </ol>

	<ol style="list-style-type: none"> <li>2. Tell students they are going to launch a balloon that is inflated with helium.</li> <li>3. Ask: “How far do you think the balloon will travel?”</li> <li>4. Have students complete the interactive Types of Energy worksheet.</li> </ol>
<b>Explore:</b>	<ol style="list-style-type: none"> <li>1. The HABSAT kit will be completed during this phase.</li> <li>2. Ask the students what type of energy will be needed to launch the balloon.</li> <li>3. Ask the students how far and long they think the balloon will travel.</li> <li>4. Ask students why they think the balloon will eventually come down.</li> </ol>
<b>Explain:</b>	<ol style="list-style-type: none"> <li>1. After completing the experiment, ask the following question: “What causes helium balloons to lose their lift?”</li> <li>2. Show the balloon’s flight path on the map (instructions included in HAB kit).</li> <li>3. Ask the students if it went as far as expected.</li> <li>4. Review the recorded data from the flight (instructions for viewing data included in HAB kit).</li> <li>5. Ask the students about the different forms of energy used throughout the experiment.</li> <li>6. Use the discussion to review vocabulary.</li> </ol>
<b>Extend:</b>	<ol style="list-style-type: none"> <li>1. Read <i>Oh, the Places You’ll Go!</i> by Dr. Seuss</li> <li>2. Have the students draw themselves in a hot air balloon traveling to that place. They will write two paragraphs about the place and what type of energy they used to get there.</li> </ol>
<b>Evaluation:</b>	<p>Students will complete Helium Lesson for Kids: Facts &amp; Uses – Quiz and Worksheet.</p> <p><a href="https://study.com/academy/practice/helium-quiz-worksheet-for-kids.html">https://study.com/academy/practice/helium-quiz-worksheet-for-kids.html</a></p>