

<b>Lesson Update and CRT Addendum</b>	
<b>Lesson/Activity Title: Mass vs. Weight: A Heavy Duty Concept</b>	<b>ID: 9-721</b>
<b>Product Number: EB-2010-03-00022</b>	<b>Grade: MS</b>
<b>URL for Lesson: <a href="http://education.ssc.nasa.gov/massvsweight.asp">http://education.ssc.nasa.gov/massvsweight.asp</a></b>	
<b>Subject: Mass, Weight, Gravity, Acceleration, Force</b>	
<b>Summary: This lesson is an exploration of the difference between weight and mass. It has video demonstrations that illustrate the effects of mass on acceleration.</b>	
<b>Materials for Lesson: Lesson has detailed materials list for each activity.</b>	

<b>Review and Recommendations</b>	
<b>ALIGNMENT TO STANDARDS</b>	
<b>NGSS</b>	
<b>Common Core State Standards in Mathematics</b>	
<b>CULTURAL RESPONSIVE TEACHING (CRT) RECOMMENDATIONS</b>	
<b>5E Lesson/Description</b>	
<b>1. Engage</b>	<p><b>This activity has been updated and includes multiple videos of astronauts on the ISS demonstrating various concepts that illustrate the difference between mass and weight using the unique microgravity conditions on the station. The videos include classroom activities to reinforce each demonstration and concept. These should effectively engage students initially.</b></p> <p><b>Students should be given the opportunity to share any experiences they have had with moving objects of varying masses (pushing friends on skates/bikes/shopping carts, moving furniture, rearranging their rooms...).</b></p>
<b>2. Explore</b>	<p><b>Have a discussion with students about phenomenon that may potentially vary based on the effects of gravity, acceleration, or force on mass (paint dripping, stalactite growth...).</b></p>
<b>3. Explain</b>	<p><b>Students should be given the primary responsibility for explanations. They should be required to explain their</b></p>

	foundational thinking and processes throughout the design of their experiment.
<b>4. Expand/Enhance</b>	Research and explore current tests being conducted and previous work done. Good science leads to more and better questions. Let students brainstorm (We know A, so what if they...).
<b>5. Evaluate</b>	Each build up activity can be individually assessed. A summative assessment can be created based on the final presentation of the individual or group's experimental proposal.

**Additional Resources:**

**All found at:**

<http://education.ssc.nasa.gov/Massvsweight.asp>