| Readorium Alignment to FOSS Kit: Forces and Motion, Types of Interaction | | |
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| **Readorium Books By Standard** | **Magazine Articles (A) and Science Alive Videos (V) By Standard** | **Teacher Resource Center Classroom Strategy Lessons (CL) with Articles (A) by Standard** |
| **NGSS: 6-8-PS2.A: Motion and Stability: Forces and Interactions: Forces and Motion**: For any pair of interacting objects, the force exerted by the first object on the second object is equal in strength to the force that the second object exerts on the first, but in the opposite direction (Newton's third law). (MS-PS2-1)<br>The motion of an object is determined by the sum of the forces acting on it; if the total force on the object is not zero, its motion will change. The greater the mass of the object, the greater the force needed to achieve the same change in motion. For any given object, a larger force causes a larger change in motion. (MS-PS2-2)<br>All positions of objects and the directions of forces and motions must be described in an arbitrarily chosen reference frame and arbitrarily chosen units of size. In order to share information with other people, these choices must also be shared. (MS-PS2-2) | | |
| • Newton's Laws<br>• Scientists who Changed the World<br>• Sports Physics | • A Titanic Collision: The Science Behind the Sunken Ship (A) | |
| **NGSS: 6-8-PS2.B: Motion and Stability: Forces and Interactions: Forces and Motion**: Gravitational forces are always attractive. There is a gravitational force between any two masses, but it is very small except when one or both of the objects have large mass-e.g., Earth and the sun. (MS-PS2-4)<br>Forces that act at a distance (electric and magnetic) can be explained by fields that extend through space and can be mapped by their effect on a test object (a ball, a charged object, or a magnet, respectively). (MS-PS2-5) | | |
| • Newton's Laws<br>• Scientists who Changed the World<br>• Space Rocks! | • A Titanic Collision: The Science Behind the Sunken Ship (A) | |
| **NGSS: 6-8-ETS1.A: Engineering Design: Defining and Delimiting an Engineering Problem**: The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that is likely to limit possible solutions. (MS-ETS1-4) (secondary to MS-PS-3-3) | | |
| • Artificial Satellites<br>• Character Traits of a Good Scientist<br>• Learning from Natural Disasters<br>• Pollution | • Inventor of the Toughest Stuff (A)<br>• Antlers, Beaks, Geckos and Us (V)<br>• Safe from Tsunamis (V)<br>• An Amazing Teen Scientist (A) | • Context Clues (CL-3 A-1 Things That Go Boom!)<br>• Determining Importance (CL-2, A-1. Dragonflies: Flying Aces) |
| **NGSS: 6-8-ETS1.B: Engineering Design: Developing Possible Solutions**: A solution needs to be tested, and then modified based on the test results, to improve it. (MS-ETS1-4) (secondary to MS-PS1-6)<br>There are systematic processes for evaluating solutions with respect to how well they meet criteria and constraints of a problem. (MS-ETS1-2), (MS-ETS1-3) (secondary to MS-PS3-3) (secondary to MS-LS2-5)<br>Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors (MS-ETS1-3)<br>Models of all kinds are important for testing solutions. (MS-ETS1-4) | | |
| • Superstition or Science | • Things That Go BOOM!: The History and Chemistry of Explosives (A)<br>• Crazy Careers in Science (A)<br>• Space psychologist (A)<br>• From Waste to Energy: Bacteria Gives a Boost(V)<br>• Hydrogen Power(V)<br>• Wave of Future- Green Gasoline (V) | • Context Clues (CL-3 A-1 Things That Go Boom!) |

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| | • Pig Poop & Other Energy Sources (V)<br>• Getting Ready for Earthquakes (V)<br>• Chores Don't Have to be a Pain in the But...ler (V)<br>• Musical Computer (V)<br>• Robots of Your Dreams(V)<br>• Robots with Whiskers (V)<br>• Sensible Sensors (V)<br>• Signing Made Simple (V)<br>• Smart Cars! (V)<br>• The Ins and Outs of the Brain (V)<br>• Strong & Sensitive: Metal Foam (V)<br>• Smart Helicopters (V)<br>• X-Ray Vision: Beyond the Bones (V)<br>• Picking Your Brain (V)<br>• The Creative Brain (V)<br>• The Good, Bad, and Baby (V)<br>• What Makes Us Tick (V)<br>• Locked-in Syndrome: (V)<br>• Nanoparticles: Tiny Glowing Cancer Killers (V)<br>• Tongue Driven (V)<br>• Vision for Blind People - Fact or Fiction(V)<br>• Extreme Bacteria (V)<br>• Lord of the Tree Rings (V)<br>• Coral Corrosion (V)<br>• Disappearing Frogs (V)<br>• Earthworm Invasion (V)<br>• ESP: A Lab in a Can (V)<br>• Flowing Free (V)<br>• Virtual Wildfires (V)<br>• Women Powered Robots (V)<br>• Wave of the Future: Clean Ocean Energy (V)<br>• A Computer's Best Friend(A) | |
| **NGSS: 6-8-ETS1.C: Engineering Design: Optimizing the Design Solution**: Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process-that is, some of the characteristics may be incorporated into the new design. (MS-ETS1-3) (secondary to MS-PS1-6)<br>The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optional solution. (MS-ETS1-4) (secondary to (MS-PS1-6) | | |
| • Microscopes<br>• Space Race<br>• Superstition or Science | • Do Scientists Cheat? (A) | |