

Rockets Away! Lessons at a Glance

Lesson	Next Generation Science Standard*	STEM Abilities	Life Skill	Success Indicator
1. Blast Off with a Paper Rocket	MS-PS2-2. Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	Build/construct Collect data Communicate/demonstrate Compare/contrast Develop solutions Draw/design Interpret/analyze/reason Measure Model/graph/use numbers Plan investigations Problem solve State a problem Use tools	Mastering technology, working with numbers	Makes a simple paper rocket, records distance, and calculates average, median, and mode
2. Rocket Redesign	MS-PS2-2. Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	Collaborate Communicate/demonstrate Draw/design Evaluate Interpret/analyze/reason Measure Observe Plan investigations Problem solve Redesign State a problem	Mastering technology, thinking critically, working with numbers	Improves paper rocket design
3. On the Launch Pad	3-PS2-1. Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.	Categorize/order/classify Collaborate Collect data Communicate/demonstrate Evaluate Interpret/analyze/reason Observe Question	Understanding systems, reasoning, thinking critically	Demonstrates and Identifies objects in motion and identifies whether forces are "pushes" or "pulls."
4. Getting Off the Ground	MS-PS2-4. Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depending on the masses of interacting objects.	Collaborate Collect data Communicate/demonstrate Evaluate Hypothesize Infer Interpret/analyze/reason Measure Model/graph/use numbers Plan investigations Summarize Use tools	Understanding systems, reasoning, thinking critically, working with numbers	Identifies forces to move objects of different sizes and mass



5. Rocket on a String	MS-PS2-2. Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	MS-PS2-2. Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	Understanding systems, reasoning, thinking critically, working as a team	Builds and tests a balloon rocket
6. Pinwheel Rockets	3-PS2-2. Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.	Collaborate Communicate Design solutions Develop solutions Draw/design Evaluate Interpret/analyze/reason Invent/implement solutions Observe Plan investigations State a problem Use Tools	Solving problems, practicing creativity, using scientific methods	Designs, builds, tests, and improves upon a pinwheel rocket
7. Design a Balloon Rocket	MS-PS2-2. Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	Communicate/demonstrate Evaluate Interpret/analyze/reason Invent/implement solutions Observe Optimize Plan investigations Predict Test Use tools	Solving problems, practicing creativity, using scientific methods	Designs, builds, tests, and improves upon a balloon rocket
8. Build a Bottle Rocket	MS-PS2-2. Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.	Build/construct Communicate/demonstrate Evaluate Interpret/analyze/reason Invent/implement solutions Observe Plan investigations Use tools	Processing information, managing resources, planning and organizing	Builds a 2-liter bottle rocket
9. Rockets Away!	MS-PS2-4. Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depending on the masses of interacting objects.	Communicate/demonstrate Measure Observe Plan investigations Use tools	Using scientific methods	Participates in, observes, and records data for rocket launches
10. How High? How Fast? Do the Math	MS-PS2-4. Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depending on the masses of interacting objects.	Communicate/demonstrate Hypothesize Infer Model/graph/use numbers Observe Plan investigations Use tools	Reasoning, working with numbers	Calculates height and velocity using data from actual launches
* The activities in <i>Rockets Away!</i> support the learning goals for the performance expectations cited, sometimes as described in the performance expectation itself but oftentimes by laying the groundwork for learning with reinforcement of the related science and engineering practices, disciplinary core ideas, and crosscutting concepts. The Next Generation Science Standards are available in their entirety at nextgenscience.org .				