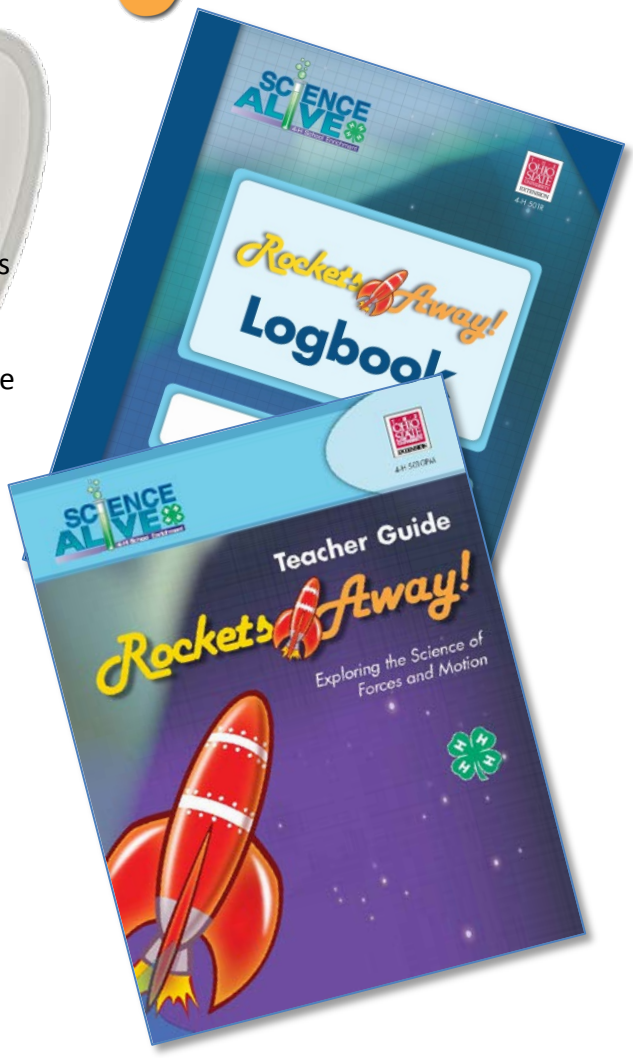
SCIENCE ALIVE
4-H School Enrichment

Rockets Away!

What can youth learn by launching a 2-liter bottle rocket? Find out with *Rockets Away!*, part of the Science Alive 4-H School Enrichment series from Ohio State University Extension, 4-H Youth Development. *Rockets Away!* Challenges youth to use science, technology, engineering, and math (STEM) skills to investigate forces and motion. Whether launching paper rockets or pressurized 2-liter plastic bottles, these action-packed activities pique curiosity, encourage collaboration and communication, and provide young scientists with unforgettable experiences.



The personal *Rockets Away! Logbooks* are meant to be used by your classroom students to record data and observations as they explore the science of forces and motion. In the accompanying *Rockets Away! Teacher Guide*, you'll find hands-on, standards-based inquiry lessons that ignite interest, develop understanding, and build skills in science, engineering, math, and technology.

Look for more about *Rockets Away!* and 4-H Science Alive online at

www.ohio4h.org/rocketsaway

If you are an Ohio resident and want to order the Rockets Away! teacher guide or reorder a set of the Rockets Away! Logbook, please contact your local county Extension office. Out-of-state residents can order online at **http://estore.ose-extension.org**.

Rockets Away!

Ohio Science Academic Content Standards

Science Inquiry and Application	Grades PreK-4 • Observe and ask questions about the natural environment. • Plan and conduct simple investigations. • Employ simple equipment and tools to gather data and extend the senses. • Use appropriate mathematics with data to construct reasonable explanations. • Communicate about observations, investigations and explanations.
	Grades 5-8 • Identify questions that can be answered through scientific investigations. • Use appropriate mathematics, tools, and techniques to gather data and information • Analyze and interpret data. • Develop descriptions, models, explanations and predictions. • Think critically and logically to connect evidence and explanations. • Recognize and analyze alternative explanations and predictions. • Communicate scientific procedures and explanations.
Strand: Physical Science	Grade 2 Topic: Changes in Motion • Forces change the motion of an object. o Motion can increase, change direction or stop depending on the force applied. o The change in motion of an object is related to the size of the force.
	Grade 5 Topic: Light, Sound and Motion • The amount of change in movement of an object is based on the weight of the object and the amount of force exerted. o Movement can be measured by speed. The speed of an object is calculated by determining the distance (d) traveled in a period of time (t). o Earth pulls down on all objects with gravitational force. Weight is a measure of the gravitational force between and object and the Earth. o Any change in speed or direction of an object requires a force and is affected by the mass (or "weight") of the object and amount of force applied.

Ohio Common Core Standards in Mathematics

Measurement and Data	• Measure and estimate lengths in standard units. (Grade 2) • Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. (Grade 3) • Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. (Grade 4) • Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. • Represent and interpret data (Grades 2-5)
Operations and Algebraic Thinking	• Represent and solve problems involving multiplication and division. (Grade 3) • Use the four operations with whole numbers to solve problems. (Grade 4) • Generate and analyze patterns (Grade 4) • Write and interpret numerical expressions. (Grade 5) • Analyze patterns and relationships (Grade 5)

The educational standards cited here are from the Ohio Department of Education *Ohio Revised Science Standards and Model Curriculum, Grades PreK through Eight*, March 2011, available online in their entirety at **www.ode.state.oh.us**.