

Rocket Activities

There are few classroom topics that generate as much excitement as rockets. The scientific, technological, engineering, and mathematical (STEM) foundations of rocketry provide exciting classroom opportunities for authentic hands-on, minds-on experimentation. The activities and demonstrations that follow are suitable for students at many grade levels.

For the most part, material and tool requirements are simple, but a few of the bigger projects require launch platforms that need to be constructed or purchased in advance. Although purchasing platforms from school science catalogs and specialty companies is an option, constructing your own is a learning process in which you can involve your students. Minimal proficiency with tools (saw, screw driver) is required. Detailed instructions (with lots of illustrations!) are provided.

As you review the activities you will notice that each supports state and national educational standards for science, technology, and mathematics. A matrix identifying specific national standards and recommended grade levels follow on the next two pages. You may “cherry-pick” activities, but linking several or using all of the activities will provide your students with a memorable and beneficial STEM unit and turn your students into “rocket scientists.” *You Are Go For Launch!*

A Note about Measurement

Where possible, all measurements used in the activities are metric. However, English units are often employed when constructing devices because most materials and parts are sized with English measures.

Principles and Standards for School Mathematics

Pre K - 12

National Council of Teachers of Mathematics

Rocket Activities

- Number and Operations
- Algebra
- Geometry
- Measurement
- Data Analysis and Probability
- Problem Solving
- Reasoning and Proof
- Communication
- Connections
- Representations

	Content Standards					Process Standards				
	Number and Operations	Algebra	Geometry	Measurement	Data Analysis and Probability	Problem Solving	Reasoning and Proof	Communication	Connections	Representations
Pop Can "Hero Engine"	✓			✓	✓		✓	✓	✓	✓
3...2...1...PUFF!	✓		✓	✓	✓				✓	✓
Heavy Lifting	✓				✓	✓	✓	✓	✓	✓
Newton Car	✓			✓	✓	✓	✓	✓	✓	✓
Rocket Races	✓		✓	✓	✓	✓	✓	✓	✓	✓
Pop! Rockets Launcher				✓				✓		
Pop! Rockets	✓		✓	✓	✓	✓	✓	✓	✓	✓
Foam Rocket	✓	✓	✓	✓	✓		✓	✓	✓	✓
Launch Altitude Tracker	✓		✓	✓	✓	✓	✓	✓	✓	✓
High-Power Paper Rocket Launcher				✓				✓		
High-Power Paper Rockets	✓		✓	✓	✓	✓	✓	✓	✓	✓
Rocket Wind Tunnel	✓			✓	✓	✓	✓	✓	✓	✓
Advanced High-Power Paper Rockets	✓		✓	✓	✓	✓	✓	✓	✓	✓
Water Rocket Launcher				✓					✓	
Water Rocket Construction			✓	✓					✓	
Project X-51	✓		✓	✓	✓	✓	✓	✓	✓	✓

Suggested Grade Levels

The matrix below displays suggested grade levels for the activities in this guide. Each activity is appropriate for a wide range of student abilities. Although grade levels are suggested, small modifications will enable activities to be used successfully with other grade levels. One area of potential adjustment are the student pages. The reading level and vocabulary on these pages may be below or above your students' abilities. Many of the activities contain tips, suggestions, and extensions that will assist you in preparing the lesson for the appropriate audience.

Suggested Grade Levels

Rocket Activities	K	1	2	3	4	5	6	7	8	9	10	11	12
Pop Can "Hero Engine"	✓	✓	✓	✓	✓	✓	✓	✓	✓				
3...2...1...PUFF!	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Heavy Lifting	✓	✓	✓	✓	✓	✓	✓	✓	✓				
Newton Car				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rocket Races				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Pop! Rockets Launcher	✓	✓	✓	✓	✓	✓	✓						
Pop! Rockets	✓	✓	✓	✓	✓	✓	✓						
Foam Rocket					✓	✓	✓	✓	✓	✓	✓	✓	✓
Launch Altitude Tracker					✓	✓	✓	✓	✓	✓	✓	✓	✓
High-Power Paper Rocket Launcher				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
High-Power Paper Rockets				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rocket Wind Tunnel				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Advanced High-Power Paper Rockets				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Water Rocket Launcher					✓	✓	✓	✓	✓	✓	✓	✓	✓
Water Rocket Construction					✓	✓	✓	✓	✓	✓	✓	✓	✓
Project X-51					✓	✓	✓	✓	✓	✓			