

ACADEMIC STANDARDS FOR SCIENCE AND TECHNOLOGY

Rockets Away: Science Education

<i>Lesson</i>	<i>Academic Standards</i>	<i>Grade Level</i>	<i>Activities Supporting Lesson Objectives</i>
I. Rockets and how they move			
<ul style="list-style-type: none"> ▪ Testing gravity 	3.2.7A: Distinguishing scientific theory and belief 3.2.7B: Describing relationships-inferences and predictions	7	Lifting and letting a ball fall-unbalancing lift and pull forces
<ul style="list-style-type: none"> ▪ Lets get lifting 	3. 2.7B: Describing relationships-inferences and predictions	7	Relationship of mass and force. Comparing force in lifting an empty bottle and a bottle filled with water.
<ul style="list-style-type: none"> ▪ Bouncing things 	3.4.7C: Explaining various motions using models	7	Bouncing a large and a small ball to show force required to bounce a greater mass and a smaller mass.
II. Moving questions about Rockets			
<ul style="list-style-type: none"> ▪ Try a little lift 	3.1.7B:Apply models to predict a given result or observation 3.2.7C:Identify and use of elements of scientific inquiry to solve problems	7	Understanding role of air-stream in lifting power. Practical on blowing an air stream on a piece of paper
<ul style="list-style-type: none"> ▪ Action/Reaction 	3.4.7D: Identifying equipments and instruments that explore the universe	7	Exercise on releasing air from an inflated balloon. Released air provides an equal and opposite reaction of forward motion similar to rocket movement..
<ul style="list-style-type: none"> ▪ Add a nozzle 	3.2.7C: Generate questions about objects that can be answered through scientific investigation. Communicate appropriate conclusions from experiment.	7	Exercise on adding a nozzle to a balloon. Importance of nozzle in directing air movement. Rocket engines have nozzles that work the same way.

<ul style="list-style-type: none"> ▪ Add a stick 	<p>3.2.7C: Generate questions about objects that can be answered through scientific investigation.</p> <p>Communicate appropriate conclusions from experiment</p> <p>Judging significance of an experiment in answering question.</p>	7	Stability of rockets. Exercise on attaching a stick to nozzle of an inflated balloon. Reduces rotation of balloon during upward movement.
<ul style="list-style-type: none"> ▪ Add a fin 	<p>3.1.7 D: Application of size and dimensions of scale to technological applications.</p> <p>3.1.7 E: Describe effect of change on one part of a system to the whole.</p> <p>.</p>	7	<p>Fins stabilize flight of balloon reducing rolling during motion.</p> <p>Role of fin for stability during motion. Controls pitch, yaw and roll. Fin stabilizes air movement acting as control.</p>
<ul style="list-style-type: none"> ▪ Testing turbulence 	3.6.7 A: Factors considered in designing an object	7	Importance of smooth rounded surfaces in shape of rockets.
<ul style="list-style-type: none"> ▪ Broom launch 	3.4.7 C: Describing motion of an object based on position, direction and speed.	7	Exercise on the center of gravity. Equivalence of stability of a broom in motion to stability of a moving rocket.
III. Lets get Launching		7	Applying the principles learned in making rockets to an actual design, construction and launch. A 2 litre bottle is used to make the rocket.