

## 3-2-1 Lift Off – Module Overview

**Student Challenge** – Design and launch an Alka-Seltzer rocket.

### Module Intent:

- Designing and conducting well-defined scientific investigations.

### Module Science Concepts

- Physical and chemical changes in matter
- Potential and kinetic energy

### Module Math Concepts

- Independent vs. Dependent variables
- Types of graphs
- Finding a mean

### **Module Engagement**

Introduce module challenge.  
Assess background knowledge.

### **Scientific Investigation**

#### **Activity 1 - Dissolving Material –**

*Teacher Directed Inquiry* – Students explore physical changes in matter and the need to control variables in scientific inquiries.

**Concepts:** Chemical change. Well structured investigation.

#### **Activity 2 - Alka-Seltzer and Water**

*Guided Inquiry* – Students observe the reaction that powers the rocket and read about variables in an investigation.

**Concepts:** Physical & chemical change. Potential & kinetic energy.

#### **Activity 3 – Temperature and Dissolving Time**

*Structured Inquiry* – Students test the effects of temperature on dissolving time.

**Concepts:** Independent and dependent variables. Graphing. Finding an average.

#### **Activity 4 – Particle Size and Dissolving Time**

*Structured Inquiry* – Students investigate the affect of particle size has on dissolving time.

**Concepts:** Well structured investigation. Dependent and independent variables. Finding a mean.

#### **Activity 5 – Different Liquids and dissolving Time**

*Open Inquiry* – Students design and conduct an investigation to determine the effect different liquids will have on the dissolving time.

**Concepts:** Well structured investigation.

### **Design and Engineering**

#### **Activity 6 – What is Form and Function**

*Structured Inquiry* – Students apply concepts from previous activities to explain relationship between form and function.

**Concepts:** Engineering process.

#### **Activity 7 – Engineer Your Rocket**

*Guided Inquiry* – Design Alka-Seltzer rocket and launch it.

**Concepts:** Engineering process.

#### **Activity 8 – Redesign and Launch**

*Guided Inquiry* - Students redesign and launch their rockets and collect data about the performance of the rocket

**Concepts:** Engineering process.

### **Module Extension Effects of Gravity**

#### **Activity 9 – What Goes Up Must Come Down**

*Structured Inquiry* - Students extend their understanding of the force of gravity.

**Concepts:** Effects of the force of gravity

#### **Activity 10 – What Might Effect Gravity**

*Structured Inquiry* - Students compare of rate of fall their understanding of the force of gravity.

**Concepts:** Air resistance.

#### **Activity 11 – Rhythms of Gravity**

*Guided Inquiry* - Students observe and compare of rate of fall of several objects.

**Concepts:** Air resistance.