Civil War Energy Launcher Makerspace Lesson Spring 2017

Background: Students will be creating a launcher out of minimal materials supplied from our school’s Makerspace. Each small group will have exactly the same bag of materials to build from. The groups will need to successfully launch two different types of marshmallows at least 2 meters. They are also simulating that they are either on the Union or Confederate sides of the Civil War and the success of their launchers help win the Battle of Bull Run.

SOL Objectives Covered in this Lesson:

**Science** 4.2 Kinetic vs Potential Energy (Students will investigate and understand characteristics and interactions of moving objects. Key concepts include: a) motion is described by an object’s direction and speed; and b) changes in motion are related to force and mass)

**Social Studies** VS. 7 b Issues that divided our country and led to the Civil War (Students will describe Virginia’s role in the war, including major battles that took place in Virginia; Battle of Bull Run)

**Math** 4.6 Estimate and measure weight/mass (Students will estimate and measure the appropriate weight/mass of an object using Customary and Metric units.) 4.7 Estimate and measure length (Students will estimate and measure appropriate length of an object or distance using Customary and Metric units.)

Civil War Energy Launcher Design Brief

Setting the Stage: The Battle of Bull Run took place near Manassas, Virginia. It was an early Civil War battle that Confederates won and Union soldiers and supporters realized would lead to a much longer war than they had hoped. One of the stand out figures from this battle was General Thomas “Stonewall” Jackson. For today’s activity, you will be forming groups and fighting for either the Confederates or the Union. Your success will help either repeat the win or change the course of history!!!

Goal: Create a launcher that will successfully send ammunition over enemy lines and take out the opposing soldiers.

Roles: Engineer and Infantry Civil War Soldier

Situation: You are serving on the front lines of the Civil War as an infantry soldier. You and your fellow soldiers are commanded to help hold off the northern Virginia area near Manassas. Your job is to successfully push soldiers back and gain territory for your side. To do this, you must successfully launch artillery towards the enemy, but also estimate distances correctly to target where the soldiers are located.

Requirements:

\*\*\*Use the materials in your bag to design a launcher that will launch two types of marshmallows successfully.

\*\*\*Estimate the mass of each marshmallow, predict which will fly the furthest and predict the distance you believe your final launches will go.

\*\*\*Sketch your launcher and label the diagram with the materials you intend to use. You must use at least 3 materials from the bag.

\*\*\*Build your agreed upon design. Launchers must be able to stand freely and can not be affixed to a surface.

\*\*\*Test your launcher prototype and make adjustments to your design based on how your testing successes or failures.

\*\*\*Successfully take out the enemy soldiers on “Launch Day”.

**Civil War Energy Launcher Task Rubric**

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| --- | --- | --- | --- | --- | --- |
| Objective | No evidence (1) | Little evidence (2) | Moderate evidence (3) | Significant evidence (4) | Total Points |
| Students designed a launcher that used at least 3 materials from their bag. |  |  |  |  |  |
| Students sketched a launcher and labeled their diagram with materials they intended to use. |  |  |  |  |  |
| Students developed a prototype of their launcher and tested out its’ successfulness, making adjustments if needed. |  |  |  |  |  |
| Students successfully created a launcher that sent ammunition at least 2 meters. |  |  |  |  |  |
| Students made estimations about the length their marshmallows would travel and their mass. |  |  |  |  |  |

Total Maximum Points (20)