# Science Lesson
# Intro to a Unit - Engineering a Catapult
# 5th Grade

**State Standard(s):** ETS 1-1; ETS 1-2; ETS 1-3

**Student Learning Objective(s):** The student will be able to brainstorm ideas for and design a catapult that can launch a cotton ball a distance of two feet.

- **Resources and Materials:**
  - Google Slides
  - Short animation
  - Student Engineering Design Process worksheet
  - Pyramid Catapult
  - Popsicle Sticks - 2 Designs
  - Science Max
- **Lesson**

**Anticipatory Set**:

I will show this short animation of 2 knights shooting a catapult for target practice.

**Input**:

I will review what an engineer is/does with the class.

"What is an engineer?" *Student answers will vary.*

- *An engineer is a person who designs and builds complex products, machines, systems, or structures. Engineers want to know how and why things work. Engineers solve problems. They use chemistry, physics, and math to figure out the best way to create new things or to improve a product.*

"You all were engineers when you made your kites. Is an engineer's job easy or difficult? Why?" *Student answers will vary.*

**Modeling**:

"For our next engineering project, you will be making catapults. Who knows what a catapult is?" *Allow for student responses.*

I will discuss what a catapult is, history of a catapult, diagram of labeled parts, etc.

I will show a video of a student-made catapult.

**Check for Understanding**:

Ask the students what kind of catapult they might be interested in making, call on a few students to answer.

**Guided Practice**:

I will have the class follow along with me on their Engineering Design Process worksheet as we fill in question 1 together - Identify the Problem: What is the challenge we are trying to solve?

***I can construct a catapult that can launch a cotton ball a distance of 2 feet.***

**Independent Practice**:

The students will then fill in questions 2 and 3 on their own. They will be brainstorming solutions or ideas on how they can build their catapult, what materials they can use, how it might work. They will then design their catapult by sketching it out.

*Some questions to have up on the screen for the students to keep in mind as they are brainstorming:*

- *What materials would be good to make my catapult?*
- *What do I already have that I can use?*
- *How am I going to build a catapult?*
- *How am I going to get that "force" to shoot my cotton ball?*
- *What are some things that I liked or didn't like from the videos?*

**Closure**:

As the students are working, I will walk around and ask the students what materials they are thinking of using for their catapult. Maybe ask why they chose those materials for the design.

To the whole class, I will let them know that there are a few more videos in Google Classroom that they can watch over the weekend or Monday morning to give them some more ideas on how they want to build their catapult.

- Pyramid Catapult
- Popsicle Sticks - 2 Designs
- Science Max