

## Spam Shooter Project Guidelines

Your group is to design a catapult-like device to throw an 8 oz can of Spam (or something equivalent) as far as possible.

### Rules:

1. You may work in groups of up to 5 people, but all the students must be from your period.
2. Safety is one of the main features that you must keep in mind. If your device is unsafe, or you are goofing around when we are testing the devices outside (which is potentially dangerous), your group will be deducted points. **The judges' decisions are final.**
3. Your group is going to be building catapults or catapult-like devices. This would include catapults (obviously), trebuchets, and other devices where there is an "arm" throwing the projectile.
4. Once the can passes the starting line, it must be a freely flying projectile – it may not be powered in the air.
5. You may make modifications to the can, or place it in something, but the can must remain intact. You may not open the can. It also must not explode when it hits the ground. If you are worried about that, wrap it in something to keep it sealed.
6. Your device may only be powered by one person. The other people in your group may not be supporting your device. It must be a freely standing object.
7. **Important dates:**

\*Test Launch: **Friday May 9**

\*Competition Date: **Monday May 12**

**\*\*\*In the event of rain, things would be postponed until the next "nice" day\*\*\***

8. **Guidelines for your design:**

When designing your catapult, make sure that you take important details into account such as cost of materials or how you will transport your project to school. You do not want to get something built and then realize that you have no way of getting it to school.

9. **The Competition:**

The total distance that your can travels (flight and roll) will be measured. The winning group in each class will receive 5 bonus points on the project. The group out of all the classes that is the winner will have 5% added to their final exam score as well. For your grade for the project you will not be judged only on the distance. Having a design that works is a large part of 50% of your grade. Points will mostly be lost if rules (especially ones dealing with safety) are not followed, or if your shooter is poorly constructed or works poorly.

One the competition date you will only be given one “successful” throw. A throw is considered successful unless there was a problem with the firing (can slips out of catapult, part of device gets stuck during firing, etc.). In the case of an unsuccessful throw, another chance will be given. **Again, the judges’ decisions regarding successful/unsuccessful throws are final, and arguments may result in a lowering of your grade.**

You must also include a short (3/4 page) write-up explaining how your device works and the physics principles involved (forces, energy, projectile motion, etc.). The write-up is 25% of your grade for the project.

For the final 25% for the project, your group must estimate the angle that the projectile is launched at, its launching height, and the point where it hits the ground and use these to calculate the initial velocity of the can.

**Final Note: Any devices that are left at school after the competition will result in a lowering of at least one letter grade. You must take them home. Your name must be on the catapults.**

If you have any questions on the project, come talk with me about them. This project counts as one full test grade for the 4<sup>th</sup> Quarter.