

Junk Box Wars



Pumpkin Chuckin'!

EACH TEAM needs a THINK ABOUT IT worksheet!

Fill out the front as we discuss the rules & requirements!

What is a catapult?

A **CATAPULT** is a device which uses an arm to hurl a **PROJECTILE** a great distance and were often used in ancient times during battle.

The path the projectile travels is called the **TRAJECTORY**.

We will be using a mousetrap and other supplies to create a catapult that will launch a marshmallow (or white pumpkins) to earn points.



TESTING PROCEDURE

Each team will have a total of three trials (chances) to earn points in each challenge:

- **DISTANCE**
- **HEIGHT, &**
- **ACCURACY.**



For the distance and accuracy challenges, points will be awarded based on the landing location (where the marshmallow comes to a stop.)

For the height challenge points will be based on where the marshmallow hits the wall.

Points will be determined by the event judges.

The team with the most points overall (sum of all 9 trials) will be named the winner for each class period and overall.

PROJECT MATERIALS

▪ Each team will receive only one set of materials. You must take all the materials even if you do not think you will use them!

Note:

- No refunds or replacements!

- Replacement mousetraps will be available to replace broken ones, but not ones that have been damaged or destroyed by your team.

▪ Teams are not allowed to share materials with other teams or bring in items of their own from home.

▪ Teams will receive a “white pumpkin” (large marshmallow) to use for practice rounds. Fresh marshmallows will be provided for the final competition. Marshmallows cannot be modified except for decorating them with a marker.

▪ Your team will be provided with a large Ziploc bag to store your materials, the tape page, the Think About It worksheet, and your device.

Notes:

- All unused materials should be saved in case repairs are needed during competition.*
- All materials must remain in the classroom, used for your device, and stored in your bag at the end of class!*
- Teams are not allowed to use the bag as part of the device.*



DEVICE REQUIREMENTS

Your team's device must be powered by the energy stored in the mousetrap's spring. Your device and the marshmallow may not be aided by a helping hand (push, shove, etc.) or other energy source (i.e. rubber bands or changing the spring).

For the distance and accuracy tests, the device may be held at a height up to 1 meter from the floor.

For the height competition, a part of the device must be touching the floor before/at the time of the launch. If the device is not touching the floor at launch time, a zero score will be given for that round.

The entire device must remain behind the launch area boundary at all times – before, during, and after the launch. Having the device (even a small part of it) cross the line will result in a zero score for that round.

Devices may NOT be taped to the floor!

More device requirements ...

Devices that break and/or do not work will be given a score of zero for the rounds that could not be completed. Teams will have time between rounds for modifications, but not major rebuilds!

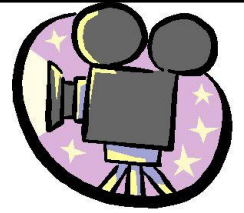
Teams are allowed to use online resources for ideas, but must use their own designs and materials provided by your teacher.

Teams will be allowed at least TWO class periods to build, practice, and modify their device. Be sure to plan a design that can be done in the time allowed and use your class time wisely! Teams that cannot use their time wisely will complete an alternate assignment.

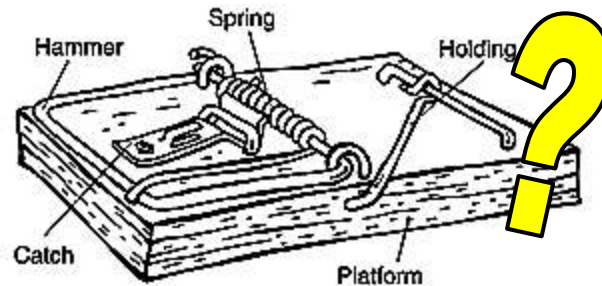


Final Testing - Monday

Think About It ...



How can we modify a mousetrap or add materials to it to create a good catapult?



Some things to consider ...

What type of “flinging” arm will you use?

How long will the arm need to be?

How will the projectile stay on your device?

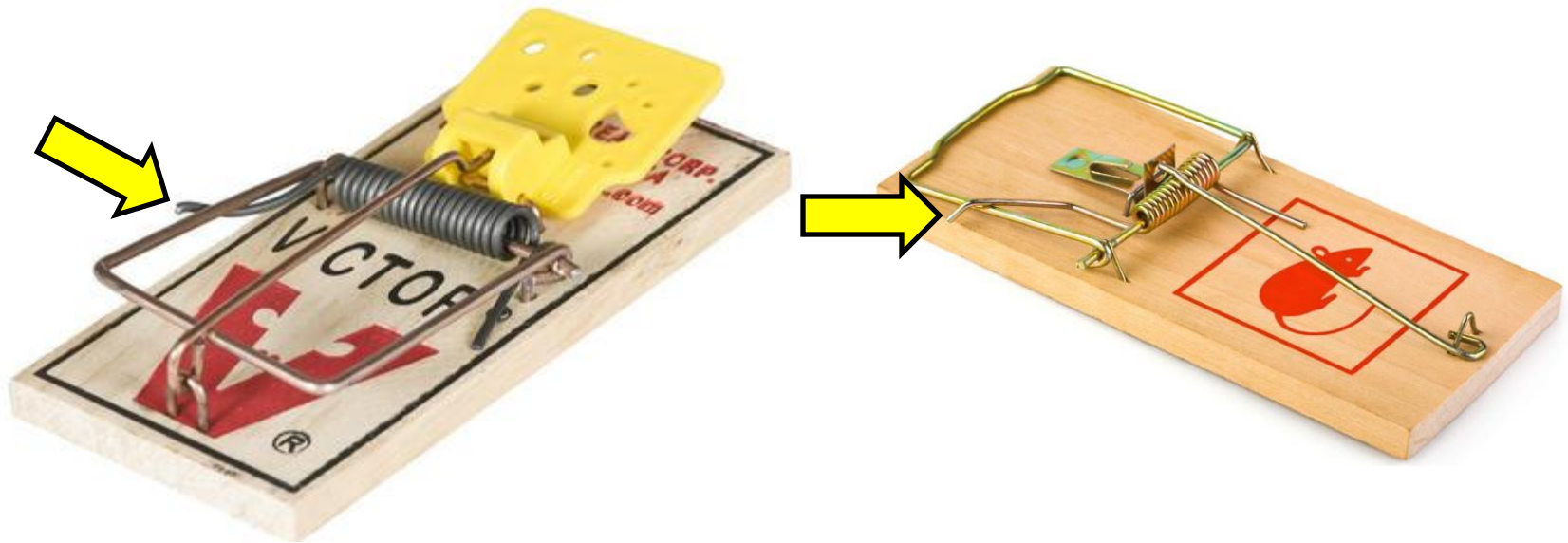
How will you release (or launch) the device?

How will you hold the device before, during, and after the launch?

Worried about getting “snapped”?

Use pliers to unhook the small wires holding down the sides of the arm.

Be sure to leave room to reattach the side wires when you are ready to use the device!



Things to Remember ...

ONE set of materials – No refunds or replacements!

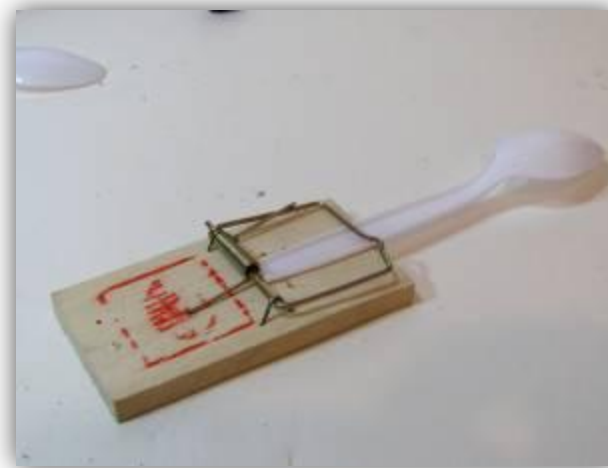
Does not include mousetraps – each group can receive one replacement mousetrap if needed.

No sharing or trading of materials is allowed! All materials must be kept in the classroom in your team's bag unless we are testing/modifying the devices.

Fling or flop?

Make sure you build the launching arm or part is on the correct side of the mousetrap's arm!

Don't build it upside down!



Questions?



❑ Fill out the BACK of your “Think About It” page and have it APPROVED BY THE TEACHER.

- *Need to draw a picture and label the materials you will use.*
- *Write 2 sentences to explain why you designed your device the way you did and how it will help you earn points.*

❑ Get a large Ziploc bag, a tape page, and ALL the materials listed in the Supply List. Write your names on the tape page.

❑ Tape will be handed out in 25 cm sections (after the first 50 cm) and should be stored on the tape page (the laminated sheet).

❑ Use your class time to build your device and make changes on your planning page if needed.

NOTE: You will have time tomorrow to practice flinging the marshmallow quietly in the hallway and make modifications.

Supply List

1 Mousetrap*

5 Straws

5 Craft sticks

1 Pipe cleaners

2 Plastic spoons

2 Plastic cups

1 Index card

200 cm Masking tape

•Replacement mousetraps will be available to replace broken ones.

•Marshmallows will be provided for each team and cannot be modified except for decorating them with a marker.

• Masking tape will be provided on a laminated paper. Teams must keep track of their tape pages during class and store them with their materials.

ALL MATERIALS MUST REMAIN IN THE CLASSROOM AND STORED IN YOUR BAG! TAKING STUFF WITH YOU WILL RESULT IN A ZERO GRADE!



Time is up for today!

Put all your materials in your Ziploc bag along with your tape page and Think About It worksheet.

Put the bag in the correct spot for your class.

Final testing will begin on Thursday!

Do not throw away any materials until told to do so. You may need them for repairs during testing. Also, so not take apart or destroy your device until told to do so! We will “recycle” as much as we can from your devices and leftover materials.

