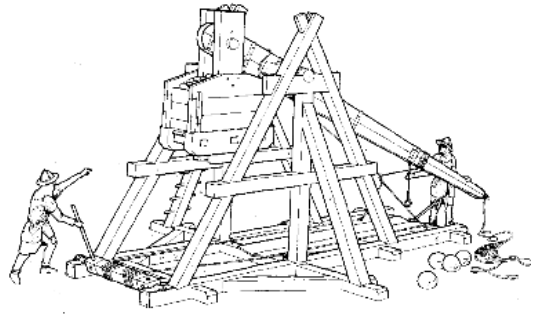


Heights Trebuchet Tournament | Physics

The Evil Panthers have been lurking around the Noble Heights on the Hill for months. War is inevitable! It has been brought to us by King Sting himself to design and test the newest kind of siege equipment, a Trebuchet! We need as many different designs as possible to test in order to find the best one. At that point, we can bring the fight to the Prowling Panthers and bring peace to our land.



Rules and Guidelines:

1. Trebuchets shall not exceed 1m by 1m by 1m. when locked and loaded.
2. Must be constructed by independent parts, no kits are to be used.
3. No springs or elastic parts can be used.
4. The trebuchet can only be powered by a system of counter weights not to exceed 2.3 kg (5lbs) (so basically using gravity)
5. You will need to make a side and top view scaled diagram of your trebuchet
6. It must be free standing and safely launch the projectile
7. Due to safety concerns your trebuchet must be triggered by a remote firing device (i.e. firing pin with string). You must have a way to secure your trebuchet to the ground (weights will be available if your trebuchet is too light and could flip over).
8. **You may not use any power tools in the construction of this. You must be monitored by a parent or guardian during the build at all times.**

Presentation Board Contents

1. Team members names (You may have an optional picture beside your Trebuchet), date & periods should be clearly placed on your presentation.
2. Picture of and name of both the tennis ball and the trebuchet (If not pictured no creativity bonus will be considered. Take pictures from vantages that give the full picture and describe any of the meanings behind your creativity - slogans etc....)
3. Essay describing the history of trebuchet (At least 600 words) (This may be broken into different parts). Some items to consider is as follows (include pictures to add life to your presentation):
 - a. Development and designs
 - b. Scientist/Eras and dates associated with development
 - c. Famous Trebuchets
 - d. Famous battles with trebuchets
4. Bibliography – Reference at least three sources (on back of presentation).
 - a. At least one source must be from print and cannot be an internet source.
5. Calculations
 - a. Calculations of the angle of launch and initial velocity of launch based on distances of launch and times in the air for your trebuchet. (Minimum of 4 trials) Real data is preferred; you must get your trebuchet operational in time to finalize calculations.
 - b. Find the following for the trebuchet Angular Velocity, Angular Acceleration, torque, Tangential Acceleration and Tangential Velocity (be sure to show the calculations).
 - c. Momentum of the projectile at the instant it is released and impulse of the ball during the swing of the trebuchet.
6. Scaled Diagram with all measurements labeled and attached to your presentation.
7. Build pictures of your trebuchets.

Battle Day:

1. On January 10th (weather permitting), the trebuchets will duel it out for first place.
2. Deliver your machine to Mr. Miller's room before school.
3. Scoring distance will be determined by seeing which tennis ball travels the farthest (and measuring it).
 - a. The tennis ball that travels the furthest (including roll and bounce) wins that heat.
4. You will supply your own tennis ball, feel free to decorate it.

All aspects regarding this project are subject to change at the teacher's discretion.

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Milestones:

- Have these accomplished by the following dates to stay on track (proof will be asked for).
- _____ December 11th Group member's formed
 - _____ December 11th Parent /Guardian acknowledgment form signed and brought back
 - _____ December 14th 1st Draft of designs due
 - _____ December 17th Meeting dates and locations for build along with individual responsibilities
 - _____ December 18th Proof of materials collected for build (pictures)
 - _____ December 20st Second draft of design due
 - _____ December 21st Rough draft of "History of the Trebuchet" due
 - _____ January 8th Initial Build and testing pictures
 - _____ January 9th Presentation boards Due
 - _____ January 10th Trebuchet completely built and brought to room before school

Rubric: This is worth 100 points of your six weeks grade!

- _____ 10% Project board with pictures of ball and trebuchet's name, partners, date, period, teacher
- _____ 25% Essay of history of the trebuchet
- _____ 5% Bibliography
- _____ 25% Calculations
- _____ 10% Scaled Diagrams
- _____ 10% Creativity of presentation and trebuchet
- _____ 10% Milestones accomplished
- _____ 5% Clean up and sportsmanship

Group Members:

When selecting group members for your group please consider the following:

- You will all receive the same grade
- It is up to the group to decide who has what responsibilities and keep each other accountable to them.
- You must be able to meet together several times.
- Milestones are set, if someone does not bring the item, everyone is affected.
- You cannot change group members once you have submitted this form.
- You may do this project alone, if you choose too, but once you have selected others to work with you must do it together (Even though you can dived up the tasks).
- You may choose members from other classes of mine, but you must "Compete" at B lunch and only B lunch as a group (no getting out of other classes).

You're Name _____ Period _____

Group Member #2 Name _____ Period _____

Group Member #3 Name _____ Period _____

Score:

Student ID:

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Parents:

Please read though this and please sign. If you have any question or concerns please feel free to email me or call me at 817-382-7804. Safety is my first priority during this and you, please do not allow your child to use power tools (if you wish to do something for them that is up too you however). Urge your child to be creativity regarding materials (for example using natural materials like sticks and ropes), it is not my intention that the students spend money on the Trebuchet. I want to encourage you to help your child (and their group) with this project. Please monitor your child at all times during this build.

Parent Name _____ Parent Signature _____ Date _____

All aspects regarding this project are subject to change at the teacher's discretion.