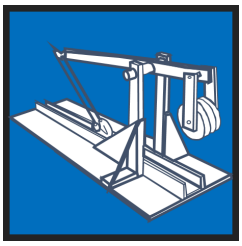
TENNIS BALL LAUNCHER Rules



You are required to follow all rules stated below in order to be eligible to win this event. It is the responsibility of teams to familiarize themselves with these guidelines. Rules are heavily adapted from Nasa's Jet Propulsion Laboratory California Institute of Technology' annual invention challenge.

Safety

- All construction materials are acceptable, except that no explosives, caustic chemicals, or other materials that might cause personal injury are allowed.
- Utilize safe energy sources . Examples of unsafe energy sources are chemical explosions and high pressure gas systems.
- All devices will be inspected prior to launch with our safety coordinator.
- Electrical power from a standard 240 V source.
- The electrical cord may extend beyond the 1x1x1 meter size
- Check with your teacher or parent supervisor to ensure safety before launching
- Always wear protective gear while launching

Objective

- Create a device that can accurately launch an officially supplied Science Games Day tennis ball over a 1.5 meter barrier to a target 10 meters from the launch line. This device will be built on your own following these guidelines and brought to Science Games Day on May 14th, 2016

Scoring

- The team that can launch a tennis ball over a 1.5 meter barrier and land it closest to the center of a target 10 meters away will receive 32 000 points. Teams scores are then calculated as a percentage from the closest distance achieved.

Device Rules

- Device must be capable of launching an officially supplied tennis ball coated in powdered chalk.
- Tennis balls are approximately 6.86 cm in diameter and have a proximate mass of 56 grams.

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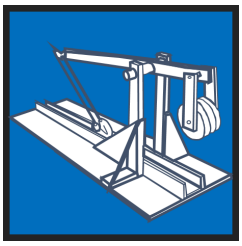

- There can be no alterations to the tennis ball including but not limited to glue, tape, freezing. Any alteration to the official tennis ball provided will result in disqualification.
- The device must be capable of accurately launching a tennis ball over a barrier on the way to the target. See image below.
- Teams will have have two attempts to launch with a120 second time limit. Failure to launch in 120 seconds will result in a disqualification.
- Must be initiated by a single operation such as cutting a string, flicking a switch, pulling a pin, etc. No human power may be used to add dynamic or potential energy to launch the tennis ball(s).
- The device may be moved by human contact once all the tennis balls that have been previously launched have touched the ground. The energy source may be reset by human contact to its starting position.
- Be physically no wider than 1.0 meters, or longer than 1.0 meters, or taller than 1.0 meters at the initial operating phase for the device.
- The device should be able to adapt to uneven ground.
- Not use any remote control devices
- Not be a modified commercially available launching device such as a tennis ball launcher or baseball pitching machine.
- Be capable of allowing the officially supplied tennis ball(s) to be installed just before the start of each launch.
- There are no weight restrictions

Contest Rules

- The contest is outdoors is between Sunway College South Building and New University Building.
- The launch site will be a mix of tile, stone, and brick. The launch site will be clearly marked with a 1.5 meter by 1.5 meter area on the ground. This will be marked in highlighted tape which will clearly identify “bounds” of the device.
- The centre of the target is located exactly 10.0 meters from the front edge of the launch site.
- A barrier that is 1.5 meters tall and 1.5 meters wide is located 2.5 meters from the front edge of the launch site.
- This barrier may or may not obstruct the view of your launch

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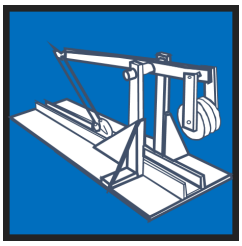
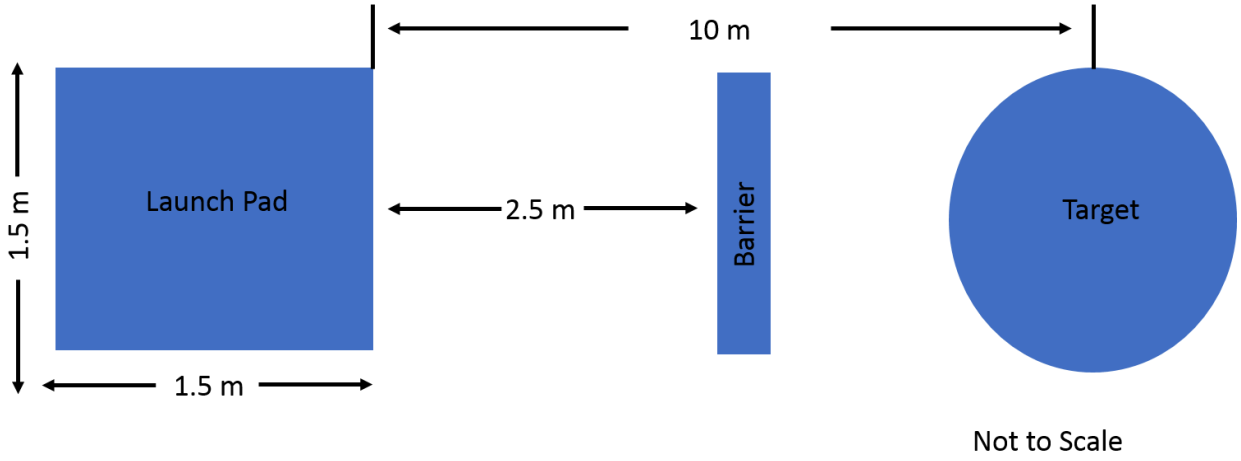


Diagram 1.



Not to Scale

Target Description

- The target will be a coloured banner with distance measurement rings place around it.
- Tennis Ball(s) will be place in chalk prior to launch and will me marked on first bounce. The distance will be measured from the centre of the target outwards.

Contest Procedure

- The order in which teams will participate is selected by a random process.
- The contestant will be given a two-minute period of time to set-up, followed by a two-minute period to operate their device, and finally teams are required to remove the device from the contest site.
- Strict time limits will be imposed to ensure that all contestants are able to operate their device.
- Participants are not allowed to launch any objects during the set-up period.
- The official starter will give a countdown (3….2….1….GO!) for the start of operation of the device. Timers will start the time at the starter's direction. The

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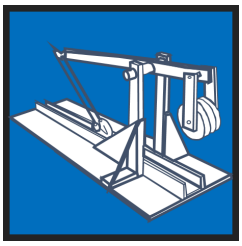
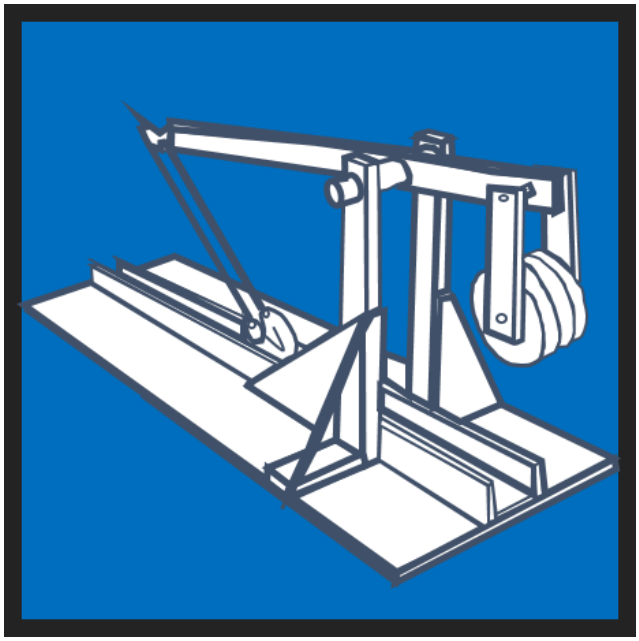


timers will stop the watch at the direction of the official starter. The official starter will voice an audible "STOP!" when the two trial attempts have been taken or 120 seconds has transpired (whichever comes first).

- After the balls have been launched, the contestant will then be asked to quickly remove their device from the contest site and place their entry in an area designated by contest officials for further judging.

Awards

- The team that launches closest to the target will be awarded.
- Other awards or certificates that may or may not be awarded include but not limited to: lightest, heaviest, smallest, largest, most unusual, most artistic, and most creative designs.



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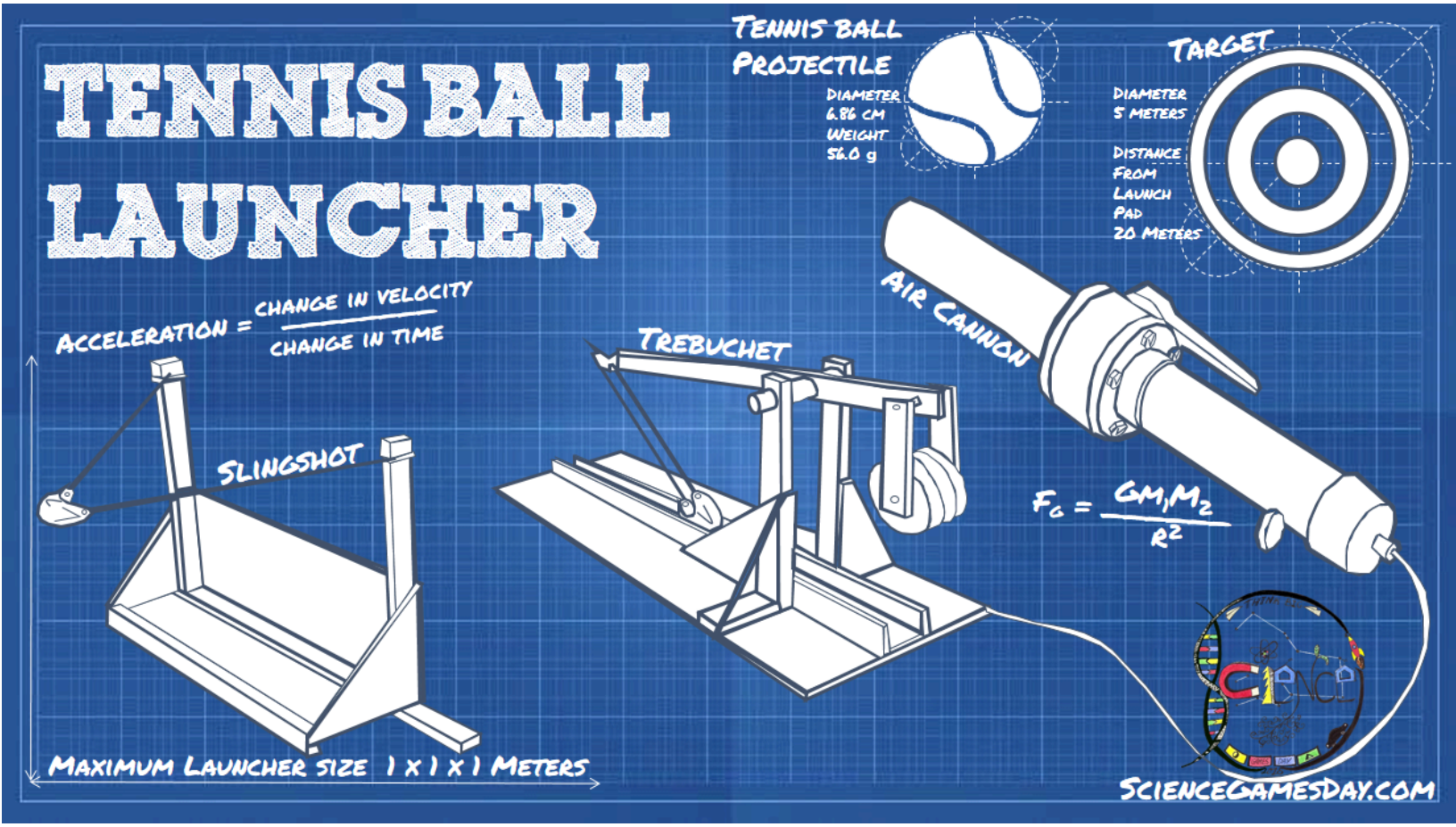

Additional Resources

- https://vimeo.com/51894922
- http://www.jpl.nasa.gov/events/inventionchallenge/2006/rules.html