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# OFFICIAL RULES FOR THE 2016 TULSA ENGINEERING CHALLENGE

## PING-PONG BALL LAUNCHER COMPETITION

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### OBJECTIVE

Design, build and test a ping-pong ball launcher powered by a common household mousetrap that will propel as many ping-pong balls as possible into a target.

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### DESIGN STATEMENT

Each team will design, build, and test a ping-pong ball launcher. The launcher shall be powered by a common household mousetrap that will, within a limited time period, propel as many ping-pong balls as possible into a target. The target will be located approximately twelve feet from the launcher (10 feet for 6<sup>th</sup> grade and under) at the height(s) shown in the attached target schematics. Although launcher weight is not a factor, the launcher must be of sufficient mass to provide stability during launches. Attaching the launcher to the table is prohibited.

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### MATERIAL SPECIFICATIONS

Utilize one (1) standard household mousetrap. Any other materials are permitted in the rest of the design.

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### CONSTRUCTION SPECIFICATIONS

All force used to propel the ping-pong balls must come from the mousetrap spring. **All parts** of the launching mechanism must be visible without disassembly of any part of the launcher. The triggering mechanism need not be the original mousetrap spring mechanism. Teams are free to design their own triggering mechanism; however, the triggering mechanism shall not contribute to the launching force. All parts of the mousetrap spring must be visible without regard to whether the parts are functional parts of the launcher or not. Nonfunctional parts may be replaced but they must be attached to the launcher and clearly visible.

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### COMPETITION SPECIFICATIONS

High school and middle school targets will consist of (3) varying diameter holes (4 inch, 6 inch, and 8 inch) as shown on the attached target schematics. 6<sup>th</sup> grade and under will consist of three (3) nominal three pound, empty coffee cans (approximate five-inch opening) positioned side-by-side in a triangular configuration. The target tables are designed to collect the ping-pong balls with minimal chance of the balls bouncing out of the target.

**Note: There may or may not be a backstop. The design should not rely on banking shots off a nearby vertical surface. There are at least (2) different sizes of ping pong balls 40mm and 38mm, be prepared to use either/both sizes.**

No part of the launcher or any accessory may at any time be closer than 12 feet horizontally to the target (10 feet for 6<sup>th</sup> grade and under). Accessories include, but are not limited to books, boxes, blocks. In general, anything used in conjunction with the launcher will be considered to be an accessory. Floor-to-ceiling height will be at least eight feet. Launchers or accessories should compensate for unequal heights of launch tables and target tables.

Separate tables will be provided for the inspection, staging, and competition. The launcher will be placed on the competition table and will be operated by the entrants. The launch area will be off limits to everyone except the team competing and competition officials. Each team shall be comprised of **no more than two people**. No additional assistance will be allowed. Each team is required to pick up all ping pong balls and to return them to the launching table immediately after competing.

Each team will be allowed 30 seconds to practice. Each team will have two (2) minutes for an unlimited number of launches. Adjustments can be made to the launcher and launch mechanism during the launch period if necessary. However, the clock will not be stopped to accommodate the adjustments. Balls may not be removed from the targets during the launching period.

Competition will run continuously during the Challenge hours between 8:30 a.m. and 12 noon.

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## JUDGING AND SCORING

Prior to the launch, each launcher will be inspected and initialed by the judges to indicate compliance with contest construction specifications. A launcher shall be registered and operated by one and only one team. **No re-registration is permitted.** A team may register only one launcher.

After inspection by the judges, the launcher shall be placed on designated staging tables. Each team is responsible for the security of its entry. No time will be spent looking for or waiting for teams not present when it is their turn. Teams not present will go to the back of the line if competition hours allow. Judges will remove and count balls remaining in targets at the end of the team's timed period. Scoring shall be as follows:

<u>6<sup>th</sup> Grade and Under</u>		<u>7<sup>th</sup> -12<sup>th</sup> Grade</u>	
Rear Left Target	20 points	8" diameter	25 points
Rear Right Target	30 points	6" diameter	50 points
Front Target	50 points	4" diameter	100 points

Decision of judges, during all phases of competition, will be final. Judges will determine winning entries at the close of the competition. Winners need not be present. Ties will be broken by the most number of balls in the 100 point target (50 point for 6<sup>th</sup> grade and under), then the 50 point target (30 point for 6<sup>th</sup> grade and under), and so on.

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## GENERAL

The contest is limited to six (6) entries per division per school. Each entry may be an individual or a team project of not more than two students.

**Registration will be done via the TECh web page which can be accessed through [www.tulsaengineer.org](http://www.tulsaengineer.org).** Questions? E-mail: [tulsatechchallenge@gmail.com](mailto:tulsatechchallenge@gmail.com)

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## PRIZES

Prizes will be awarded for three divisions as follows: Upper Division (9<sup>th</sup> thru 12<sup>th</sup>), Middle Division (7<sup>th</sup> thru 8<sup>th</sup>) and Lower Division (6<sup>th</sup> Grade and under). In the event of a tie, prizes will be equally distributed between winning entries.

First Place:	\$100 cash and \$25 cash for their classroom.
Second Place:	\$75 cash and \$25 cash for their classroom.
Third Place:	\$50 cash and \$25 cash for their classroom.

Cash prizes will be awarded by a bank check and issued to the teacher/school listed on the registration to be cashed and distributed to the winning student(s). We will mail a check to the address listed on the registration within a few weeks of the competition. If you do not receive your prize within a few weeks, please email [info@tulsaengineer.org](mailto:info@tulsaengineer.org) with your team name, school, and competition won.

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