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## 2018 CATAPULT

### **PURPOSE:**

To build a catapult that will propel a standard golf ball to hit targets at 30 ft and 40 ft.

### **GENERAL INFORMATION:**

1. A team will consist of 1 or 2 individual(s) working together to accomplish a common purpose.
2. Teams will be assigned a sequential number at event check-in, which will be used to call teams to the competition area. Teams not present when their number is called, will not earn points related to catapult performance.
3. The Angelina County Science & Tech Fair, George H. Henderson, Jr. Exposition Center (Expo Center), and the Lufkin/Angelina County Chamber of Commerce are not responsible for any loss or damage to materials/projects.
4. An Electronic Submission must be submitted one week prior to project check-in/competition.
5. The Catapult must be present to check-in.

### **MATERIALS PROVIDED BY SCIENCE & TECH FAIR STAFF AT EVENT:**

1. Standard size golf ball
2. Target Area
3. Stop watch (to be operated by judge)

### **CATAPULT DESIGN REQUIREMENTS:**

- a. Entire catapult (through its full range of motion) must fit within a 3ft x 3ft x 3ft cube (Figure 3: Catapult Dimensions).
- b. The catapult can be powered by strings or elastic devices. No rockets, motors, explosives, or compressed air can be used as a power source.
- c. The catapult should provide some leeway to adjust for the size of a standard golf ball.
- d. No portion of the catapult may cross the launch line during competition. Crossing the launch line will result in disqualification.



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### SCORING GUIDELINES (See Attached Scoring Rubric):

#### Safety

- a. Participant and spectator safety is the primary concern. Judges will perform an inspection of the catapult at check-in. Any catapult that appears unsafe or uncontrollable will be disqualified by Science & Tech Fair Staff prior to the competition. No launch will be made from an unsafe device.
- b. Spectators will be kept a safe distance away from launching zone and target area (as determined by Science & Tech Fair Staff).
- c. No students or spectators will enter the target area.

#### 1. Electronic Submission:

- a. For the purpose of the Angelina County Science & Tech Fair, an **electronic submission** is defined as either a provided template on line or using your own template.
- b. The template will provide specific information regarding topics and content for each section.

##### i. Title Page

1. Project Title
2. Event
3. Name(s) of Participant(s) with Grade
4. School
5. Teacher

##### ii. Table of Contents or Tabs with each Section labeled and numbered.

##### iii. Section 1: Define the Problem and Constraints – Questions might include but not limited to:

1. What is the problem?
2. What do we want to design?
3. What do we want to accomplish?
4. What are the specifications or limitations?

##### iv. Section 2: Research and Background Information

1. Research completed related to the solution
2. Journal entries showing project progress (date/time and accomplishments of meetings)
3. Provide a reference section/bibliography to give credit to the sources of information (ex. websites, books, etc.) and people who helped with your project

##### v. Section 3: Develop Possible Solutions – BRAINSTORM IDEAS

1. Show various ideas through sketches, diagrams or notes



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- vi. Section 4: Select a Promising Solution
    1. List of materials, quantities, and source for each item.
      - a. Procedure: Step by step instructions for constructing the contraption
  - vii. Section 5: Build a Prototype – include photos.
  - viii. Section 6: Test and Evaluate Prototype
    1. Trial data used to solve the problem, using tables and/or graphs (if applicable)
  - ix. Section 7: Improve and Redesign if needed
    1. Description of at least one modification made between design and final product. Description should include:
      - a. Why the change was made
      - b. Any positive and/or negative effect(s) of the change
2. Performance Evaluation:
    - a. Ability to hit targets at 30 ft. and 40 ft. from launch line (See Figure 1: Launch Area Diagram, Figure 2: Targets).
  3. Presentation:
    - a. Ability to explain catapult design to judges at check-in.
    - b. Teams are encouraged to develop a theme for their catapult.
    - c. Scored on the basis of design, creativity, and overall appearance.



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### COMPETITION PROCESS:

1. Teams must present their catapult during event check-in.
2. Catapults will be measured at check-in. Catapults exceeding the size limit will be disqualified (Requirement 2a).
3. Each team will be interviewed by judges about their catapult at check-in.
4. Teams are responsible for moving catapult from staging area to competition area.
5. Teams not present when their number is called on competition day, will not earn points related to catapult performance.
6. Teams will be allowed (6) launches within (6) minutes. Points will be awarded for launches that directly enter the targets (no ground bouncing allowed). Targets may be shot in any order. Additional points will not be awarded for hitting the same target(s) multiple times. See the Scoring Rubric for target point values.
7. At the conclusion of competition, catapults must be removed from the Expo Center. Teams are responsible for moving catapult from competition area to late pick-up area. (See the Official Rules document for additional information)
8. Electronic submission score will be used as the tie breaker.

## 2018 CATAPULT

### ILLUSTRATIONS

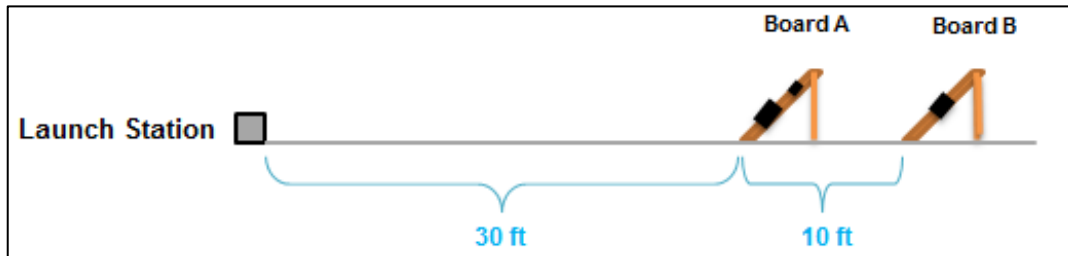


Figure 1: Launch Area Diagram

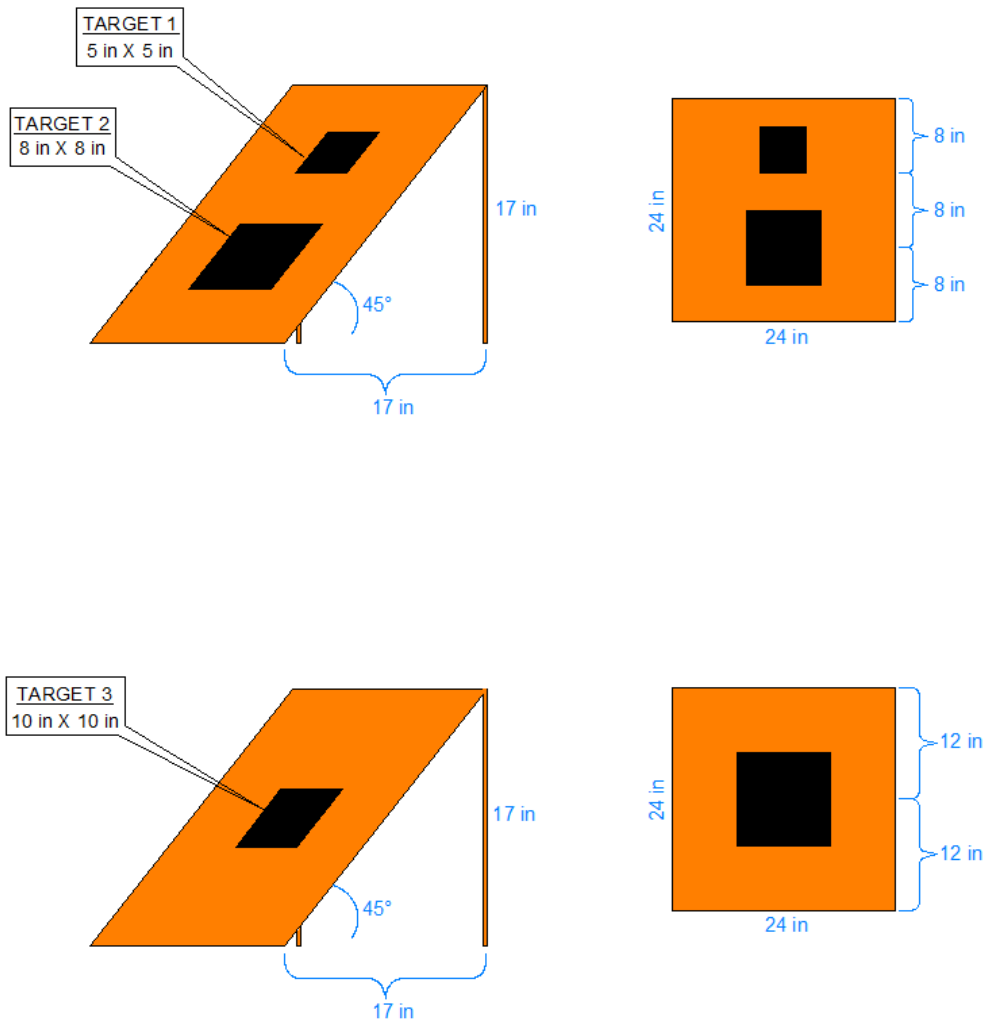


Figure 2: Targets

## 2018 CATAPULT

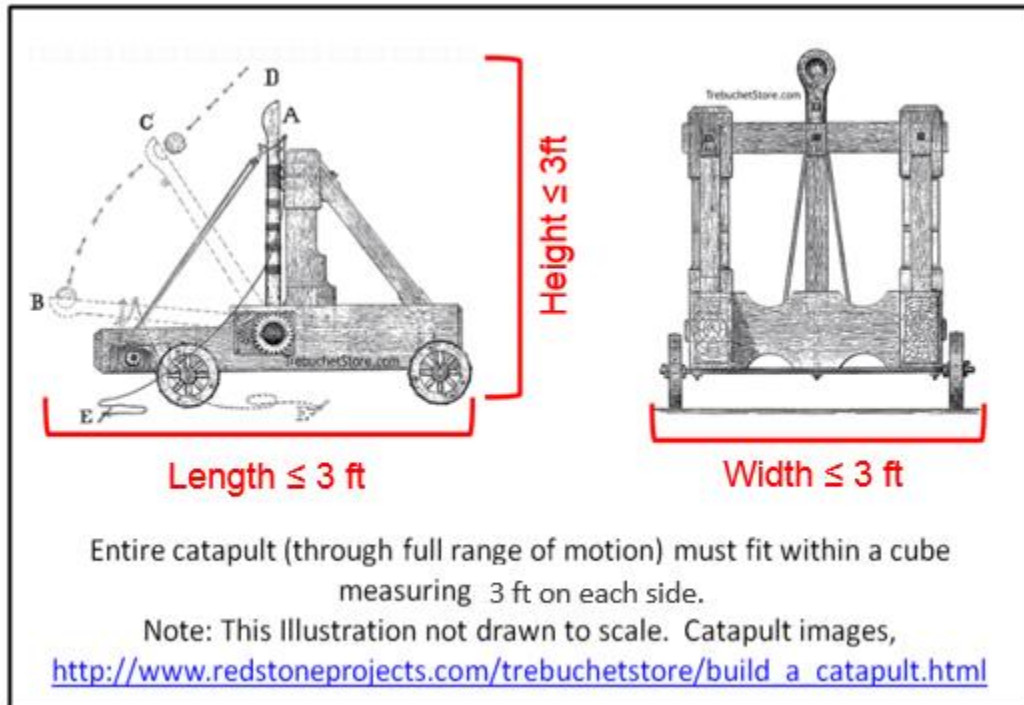


Figure 3: Catapult Dimensions



## 2017 CATAPULT

**Team Number** (Provided at Check-In):

<u>Team Member Name</u>	<u>School</u>	<u>Grade</u>
(1)		
(2)		

**DIVISION:**

Middle School (Grades 6-8)

High School (Grades 9-12)

**SCORING:**

ELECTRONIC SUBMISSION CONTENT	Available Points	Awarded Points
Overall Neatness and Organization of Templates	5	
Define the Problem	5	
Research and Background Information	5	
Develop Solutions - Brainstorm	5	
Select Promising Solution	10	
<ul style="list-style-type: none"> <li>- Process used to construct the machine</li> <li>- List of materials, quantities, &amp; source</li> </ul>		
Build a Prototype (include pictures)	5	
Test and Evaluate Prototype	5	
<ul style="list-style-type: none"> <li>- Diagram(s) and Analysis</li> <li>- Description of design modification(s)</li> </ul>		
Improve & Redesign	5	
<b>ELECTRONIC SUBMISSION TOTAL</b>	<b>45</b>	

PRESENTATION		
Verbal presentation to the judges	10	
<b>PRESENTATION TOTAL</b>	<b>10</b>	

PERFORMANCE EVALUATION		
<b>Accuracy</b> (Figures 2 & 3)	Target 1:	20
	Target 2:	10
	Target 3:	15
<b>PERFORMANCE EVALUATION TOTAL</b>	<b>45</b>	

<b>TOTAL PROJECT SCORE</b>	<b>100</b>	
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