

- LEVEL:** Middle School/High School
- NUMBER OF TEAMS:** One (1) team per school can participate at the MESA Day state competition.  
Three (3) teams can participate at MESA regional events.
- TEAM MEMBERS:** Two (2) to Six (6) Students per Team
- OBJECTIVE:** Team will design a helicopter that is made 100% of paper that will land on a target while staying in the air for the longest time.
- High School teams must have a payload that weighs, at minimum, 10 grams
- Students will also be required to submit their design poster ahead of MESA Day for review and scoring.
- MATERIALS:** Only paper is allowed for helicopter. For the high school weights, non-paper material is allowed for only the weight.
- DESIGN PARAMETERS:**
1. The helicopter must:
    1. Be made of only paper.
    2. Be, at minimum, 8 cm in length (length across the blades)
    3. Be, at minimum, 5 cm in height (base to top)
  2. The helicopter will be dropped from a height of at least 6 meters
  3. The target will be a circle with a diameter of 1 meter
  4. The helicopter must be labeled with the school name
- TESTING PARAMETERS**
1. Two (2) team members are required to be present during testing.
  2. Team members will go to designated launching spot when directed by judges
  3. Team will be allowed 30 seconds to line up their launch.
  4. Team will release their helicopter and time will start.
  5. Time will stop when the helicopter reaches the ground or target
- SPECIFICATION CHECK:**
1. Teams must arrive during the designated specification check time. Teams not arriving during spec check will receive a performance score of zero. See event agenda for exact times.
  2. Teams will submit their design poster two (2) weeks before competition for judging.
  3. During specification check, teams will check in to the competition area and submit their helicopter for inspection to ensure the design conforms to dimensions, materials, and construction rules.
  4. Devices must be in testing condition prior to device inspection. If devices are disqualified during inspection check, design changes will not be allowed. Only devices passing inspection will be allowed to participate in the performance tasks.

5. Repairs are allowed, replacement parts and materials only, and all repairs must be done in the impound area under supervision of a judge. The addition or exchange of parts that, in the opinion of the judge, would alter the design or function of the launcher is NOT allowed. No tools or supplies will be available at the event. Teams should bring any repair tools and repair materials with them.
6. All repair materials to be used during the competition must be impounded with the device. Tools may be kept by the team and need not be impounded. MESA will not provide tools.
7. After clearing specification check, all launchers will be impounded until testing.

#### **JUDGING:**

1. Team will arrive at least 10 minutes before testing time
2. When directed by judges, teams will collect their helicopter and proceed to the testing area.
3. Judge will direct the team to drop the helicopter and start the timer when released.
4. When the helicopter reaches the ground, judges will stop the timer.
5. Judge will record the score of landing on the target.
  1. If the helicopter does not land in the target, judges will measure the distance from the outer edge of the target to the landing spot in metric units
6. Teams will have three (3) attempts

#### **SCORING CRITERIA:**

1. Teams will be judged on :
  1. Time and Accuracy
  2. Design Poster
2. Time will be judged on how long the helicopter stays in the air in seconds to the nearest hundredth place (2 decimal places)
3. Accuracy will be measured by where it lands on or by the target
  - a. Bullseye – 100 points
  - b. Inner ring – 60 points
  - c. Outer ring – 35 points
  - d. Outside the target – 35 – (cm from target \* 0.1)
4. Time and Accuracy Scores will be averaged.
5. The Time and Accuracy scores will be multiplied together for the Performance Score
6. The Final Score will be determined by adding the Performance Score and Poster Score.

School: \_\_\_\_\_

Student Names: \_\_\_\_\_

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**Specification Check (circle one):**

	<b>Pass</b>	<b>Fail</b>
1. Team arrived on time for spec check and impounding	Yes	No
2. Team has submitted a Design Poster?	Yes	No
3. The helicopter is, 100% paper, excluding high school payload	Yes	No
4. <b>High School</b> Team has a payload of at least 10 grams	Yes	No

**Final Score:**

<b>Time</b>			<b>Accuracy</b>	
<b>Attempt</b>	<b>Time (sec)</b>	<b>Attempt</b>	<b>Distance from Target</b>	<b>Score</b>
1		1		
2		2		
3		3		
<b>Average</b>			<b>Average</b>	

	<b>Final</b>
<b>Time Average (in seconds)</b>	*
<b>Accuracy Average</b>	
<b>Final Score</b>	+
<b>Poster</b>	=
<b>Total</b>	

**Lead Judge Signature:** \_\_\_\_\_

**Student Signature:** \_\_\_\_\_

**Comments:**

**Rubric for Design Poster**

Category	Excellent (3 points)	Met Criteria (2 points)	Poor (1 point)	Not Present (0 points)
<b>Project Overview</b> - team summarizes the project, including team objective(s), successes, challenges, and performance expectation				
<b>Helicopter Graphic</b> – Team has a graphic of their paper helicopter				
<b>Helicopter Information</b> – Team has a bulleted list that describes the size and shape of their helicopter				
<b>Testing Data 1</b> - Team has a graphic of testing data that helped determine their design decisions				
<b>Testing Data 2</b> – Team has a 2 <sup>nd</sup> graphic of testing data that helped determine their design decisions				
<b>Launcher Name</b>			Yes	No
<b>School &amp; Team Member Names</b>			Yes	No
<b>School Logo</b>			Yes	No
<b>MESA Logo</b>			Yes	No
<b>Column Totals:</b>				
<b>Total Score:</b>				