

LEVEL	Middle School / High School
NUMBER OF TEAMS	Regional Design Day - up to 3 teams per school; MESA Day - 1 team per school
TEAM MEMBERS	3-5 students

OBJECTIVE

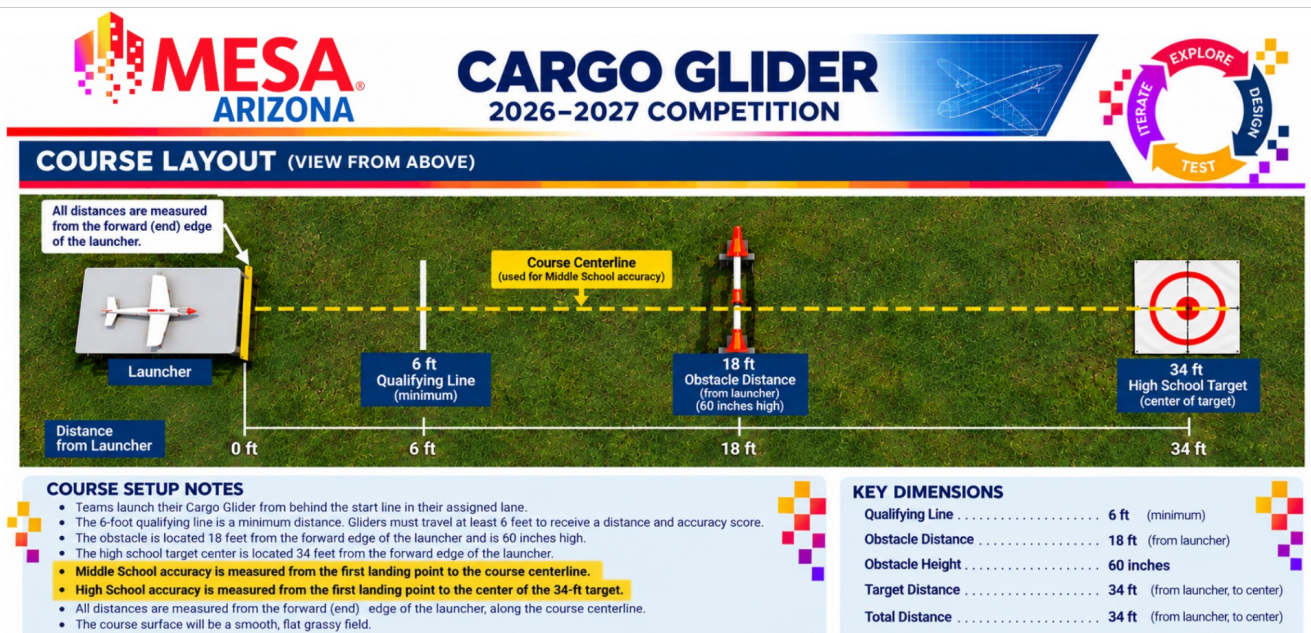
Build an original glider that carries the required cargo (payload) of table-tennis balls, clears a 60-inch obstacle, and flies accurately. Middle School is scored for straight flight from the centerline; High School is scored for landing accuracy near a target.

MATERIALS, CONSTRUCTION & PAYLOAD

- Gliders must be original student work; premanufactured/store-bought gliders are not permitted.
- Any safe materials may be used. There is no maximum glider size, but the glider must fit safely on the official launcher and clear the launcher table and clamps.
- No motors, external thrust/lift devices, remote-control systems, or hazardous materials.
- The official Arizona MESA launcher rubber band is the only permitted launch-energy source.
- **Cargo (payload): standard, unmodified 40 mm table-tennis balls (about 2.7 g each). Middle School carries 2; High School carries 4.**
- The complete payload must remain aboard through first ground contact. If any required ball separates earlier, the flight earns 0 performance points.
- The glider must be clearly labeled with the school's full name and include an identifiable feature for attachment to the official launcher.
- Teams should bring tools and materials needed for repairs. Repairs between official flights may be completed only by team members.

OFFICIAL LAUNCHER, COURSE & FLIGHTS

- Arizona MESA provides the official launcher, rubber band, clamps, obstacle, and course markings at the event.
- A flight must travel at least 6 ft from the forward/end edge of the launcher to qualify for accuracy scoring.
- The obstacle is 60 inches high and is located 18 ft from the forward/end edge of the launcher.
- High School target center is 34 ft from the forward/end edge of the launcher.
- Each team receives one optional, unscored practice launch after passing specification check. The practice uses the official launcher/course and is at the team's own risk.
- Each team then receives two official flights. The better qualifying flight determines the primary accuracy score.



Cargo Glider course layout. All distances are measured from the forward/end edge of the launcher.

MIDDLE SCHOOL - STRAIGHT FLIGHT

Judges measure the shortest distance from the glider's first point of ground contact to the course centerline. Smaller distance is better.

HIGH SCHOOL - PRECISION LANDING

Judges measure the straight-line distance from the center of the target to the glider's first point of ground contact. Smaller distance is better.

PERFORMANCE SCORING - 75 POINTS

Accuracy = 60 points. Obstacle Clearance = 15 points.

For each level, the closest qualifying glider earns 60 accuracy points and the furthest qualifying glider earns 5 accuracy points. Other qualifying gliders receive proportionally distributed accuracy scores between 5 and 60 based on measured accuracy. The exact calculation is completed by event judges.

A qualifying flight that clears the 60-inch obstacle earns 15 Obstacle Clearance points. A nonqualifying flight earns 0 performance points for that flight.

Tie-breaking uses the second official flight, then the actual measured accuracy of the best flight, then the actual measured accuracy of the second flight.

SPECIFICATION & SAFETY

Unsafe gliders may not launch until corrected and reinspected. Ordinary flight/specification failures affect performance scoring rather than automatically disqualifying the team; the poster remains eligible. Serious or intentional violations may result in full disqualification.

TL;DR

Build an original glider that carries the required cargo (payload) of table-tennis balls, clears a 60-inch obstacle, and flies accurately. Middle School is scored for straight flight from the centerline; High School is scored for landing accuracy near a target.

READ THE FULL SPECIFICATIONS. The TL;DR is a quick reference and does not replace the complete rules.

ENGINEERING DESIGN POSTER - 25 POINTS

Submit one 36 in. high × 48 in. wide landscape poster as a PDF. It is due by 5:00 p.m. at least two weeks before MESA Day; Arizona MESA will announce the exact date and submission process.

Template: [Arizona MESA Engineering Design Poster Template](#). Recommended, but not required.

Include the project/prototype name, school, team member names, school logo, MESA logo, and the team's Explore → Design → Test → Iterate engineering story.

Area	Pts	What judges look for
Explore	5	Understanding of the challenge, criteria/constraints, research, and ideas considered.
Design	5	Selected approach, key features, and design decisions.
Test	6	Relevant testing/data/evidence and what the team learned.
Iterate	6	Evidence-informed changes, retesting/evaluation, and improvement or next steps.
Communicate	3	Clear, organized communication that makes the engineering easy to understand.

CARGO GLIDER - MIDDLE SCHOOL JUDGE SHEET

School: _____ Team: _____

Judge: _____ Flight Station: _____

SPECIFICATION & SAFETY CHECK

Status	PASS	CORRECTED & PASSED	DID NOT PASS
Mark one	☐	☐	☐

OFFICIAL FLIGHT RECORD

Required cargo: 2 table-tennis balls. Accuracy measurement: shortest distance from first ground contact to course centerline.

Flight	≥ 6 ft?	Cargo aboard through first contact?	Qualifying Flight? Must say YES to the last two	Accuracy measurement	Cleared 60-in. obstacle?
1	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	_____	☐ Yes ☐ No
2	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	_____	☐ Yes ☐ No

PERFORMANCE SCORE - 75 POINTS

Best qualifying flight used for primary accuracy scoring. Record the second official flight for tie-breaking as specified in the rules.

Accuracy Score	_____ / 60
Obstacle Clearance Score	_____ / 15
Performance Score	_____ / 75
Engineering Design Poster	_____ / 25

FINAL SCORE

Accuracy (60) + Obstacle Clearance (15) + Engineering Design Poster (25) = 100 points

FINAL SCORE: _____ / 100

JUDGE NOTES

CARGO GLIDER - HIGH SCHOOL JUDGE SHEET

School: _____ Team: _____

Judge: _____ Flight Station: _____

SPECIFICATION & SAFETY CHECK

Status	PASS	CORRECTED & PASSED	DID NOT PASS
Mark one	☐	☐	☐

OFFICIAL FLIGHT RECORD

Required cargo: 4 table-tennis balls. Accuracy measurement: straight-line distance from target center to first ground contact.

Flight	≥ 6 ft?	Cargo aboard through first contact?	Qualifying Flight? Must say YES to the last two	Accuracy measurement	Cleared 60-in. obstacle?
1	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	_____	☐ Yes ☐ No
2	☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	_____	☐ Yes ☐ No

PERFORMANCE SCORE - 75 POINTS

Best qualifying flight used for primary accuracy scoring. Record the second official flight for tie-breaking as specified in the rules.

Accuracy Score	_____ / 60
Obstacle Clearance Score	_____ / 15
Performance Score	_____ / 75
Engineering Design Poster	_____ / 25

FINAL SCORE

Accuracy (60) + Obstacle Clearance (15) + Engineering Design Poster (25) = 100 points

FINAL SCORE: _____ / 100

JUDGE NOTES
