



1. **DESCRIPTION:** Prior to the tournament teams design, construct, and test elastic-launched gliders to achieve the maximum time aloft.

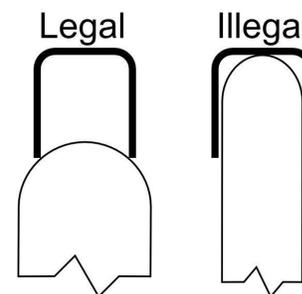
A TEAM OF UP TO: 2 EYE PROTECTION: B IMPOUND: No APPROXIMATE TIME: 6 minutes

2. **EVENT PARAMETERS:**

- Teams may bring up to 2 gliders for final inspection, flight log(s), any tools, and two stand-alone calculators of any type.
- Participants must wear eye protection. Participants without proper eye protection must be immediately informed and given a chance to obtain eye protection if time allows.
- Event Supervisors will provide all measurement tools and timing devices.

3. **CONSTRUCTION PARAMETERS:**

- Gliders may be constructed from published plan(s), commercial kits and/or student designs.
- Participants must not use any components with pre-glued joints or pre-covered surfaces.
- The glider must be constructed from only the following types of materials: wood, foam, paper, plastic film, carbon fiber, tape, thread, glue, and/or ballast. The ballast may be any malleable non-metallic substance.
- The functional components may be attached to each other using tape, thread and/or glue.
- The mass of the glider throughout the flight must be more than 3.0 g and less than 10.0 g.
- Wingspan must not exceed 28 cm at any time.
- The blunt nose of the fuselage, when inserted into a lip balm cap with inside dimensions of ~1.57 cm deep and ~1.37 cm wide must not touch the end.
- Launch handle(s), excluding elastic, must be less than 1 m long in any orientation, be supported completely by the students, and be of a safe configuration. The elastic used in the launch handle must be non-metallic and must be in contact with the glider throughout the launch. Elastic must remain on the launch handle. If elastic leaves the launcher, timing will end for that flight.
- Each glider must be labeled so the Event Supervisor can easily identify the team to which it belongs.
- Teams who build their glider in a canard configuration, where a smaller fore wing or horizontal stabilizer is placed in front of the main or larger wing and there is no rear horizontal stabilizer, will be eligible for a bonus to their single flight score. See SCORING (5.d.) for more details.



4. **THE COMPETITION:**

- The event must be held indoors. Tournament officials must announce the room dimensions (approximate length, width and ceiling height) in advance of the competition. Tournament officials and the Event Supervisor are urged to minimize the effects of environmental factors such as air currents.
- Once participants enter the cordoned off competition area to trim, practice, or compete they must wear eye protection at all times and not receive outside assistance, materials, or communication. Teams violating these rules must be ranked below all other teams. Spectators must be in a separate area.
- During inspection each team must present a flight log of recorded data. Data must include 4 or more parameters (3 required and at least 1 additional) for 10 or more test flights prior to the competition. The required parameters are: 1) estimated/recorded peak flight height after launch, 2) approximate length of elastic (relaxed), and 3) flight time. The team must choose an additional parameter beyond those required (e.g., orbit diameter, cross section of elastic launch loop, height at transition to glide pattern, launch angle, etc.).
- At the Event Supervisor's discretion:
 - multiple official flights may occur simultaneously;
 - test flights may occur throughout the contest but must yield to any official flight; and,
 - no test flights will occur in the final half-hour of the event's last period, except for teams that declare a trim flight during their 5-minute flight period.
- A self-check inspection station may be made available to participants for checking their glider and launch handle dimensions prior to being measured by the officials.
- Participants must present their glider(s), launch handle(s), and flight log for inspection immediately prior to their 5 official flights. Event Supervisors will return flight logs after inspection. Timers will follow teams as they prepare and launch their gliders.

For Event Supervisors Only - Do Not Post
ELASTIC LAUNCHED GLIDER (CONT.)



See General Rules, Eye Protection & other Policies on www.soinc.org as they apply to every event.



- g. Gliders must be launched from a launch handle by a single participant who must be at floor level.
 - h. Teams may make up to a total of 5 official flights using 1 or 2 gliders.
 - i. After check-in teams must be given a 5-minute flight period, starting when their first flight (trim or official) begins. Any flight beginning within the 5-minute period must be permitted to fly to completion. Participants may make any adjustments/repairs/trim flights and may switch gliders or launch handles during their 5-minute Flight Period.
 - j. Gliders will be placed on the ground at the location where the participants choose to make their first flight. Once a team picks up their glider the team will have 1 minute to launch their first flight (trim or official). Time taken in the Preflight Period will impact a team's final score (see 5.b.). If 1 minute passes without the first flight (trim or official) having taken place the 5-minute flight period will begin and no Bonus will be awarded.
 - k. Participants must declare to the Timers before any launches during their Flight Period whether it is an official flight or trim flight. If teams do not indicate the flight type before the launch, it must be considered official. Teams must not be given extra time to recover or repair their gliders.
 - l. Time Aloft for each flight starts when the glider leaves the launch handle and stops when any part of the glider touches the floor, stops moving due to an obstruction (such as a glider landing on a girder or basketball hoop), or the Event Supervisor(s) otherwise determine the flight to be over.
 - m. Event Supervisors are strongly encouraged to utilize 3 Timers on all flights. The middle value of the 3 Timers must be the official Time Aloft for that flight, recorded in seconds to the precision of the device used.
 - n. Gliders must only be launched while aimed at any point on the ceiling. Participants must not aim for the walls, spectators, low obstructions, etc.
 - o. Participants must not steer their gliders during the flight.
 - p. In the unlikely event of a collision with another glider, a team may elect a re-flight. The decision to re-fly may be made after the glider lands. Timers are allowed to delay a launch to avoid a possible collision. The 5-minute period does not apply to such situations.
 - q. Teams filing an appeal must leave their glider(s) and flight log(s) in the event area.
5. **SCORING:**
- a. A Team's Score is the sum of their three longest Times Aloft (Accumulated Flight Score) after multipliers are applied. High Score wins.
 - b. Bonus: Once a team picks up their glider (4.j.) a timing official will start a Preflight Period stopwatch. If their first flight, trim or official, is launched within 1 minute, teams will earn a 1.10 multiplier to their overall Accumulated Flight Score. If they fail to launch within 1 minute, the 5-minute Flight Period will start and no bonus will be awarded.
 - c. Bonus: Any official glider's fuselage that can straddle a 32 cm (longer than 32.0 cm) opening with the overall length of the fuselage will earn a 1.10 multiplier for each flight where the glider is used.
 - d. Bonus: A single flight score will be multiplied by a factor of 1.25 for each flight of a Glider flying in a canard configuration. The canard configuration is where a smaller fore wing or horizontal stabilizer is placed in front of the main or larger wing, there is no rear horizontal stabilizer.
 - e. Teams with incomplete flight logs must have 10% deducted from their Final Score.
 - f. Teams without flight logs must have 30% deducted from their Final Score.
 - g. Teams with Construction or Competition violations must be ranked after all teams that do not violate those rules.
 - h. Ties must be broken by the longest non-scored Time Aloft.

Recommended Resources: The Science Olympiad Store (store.soinc.org) carries the Elastic Launched Glider Video and Problem Solving/Technology CD; other resources are on the event page at soinc.org.

GENERAL RULES

See General Rules, Eye Protection & other Policies on www.soinc.org as they apply to every event.

GENERAL RULES, CODE OF ETHICS, AND SPIRIT OF THE PROBLEM

The goal of competition is to give one's best effort while displaying honesty, integrity, and good sportsmanship. Everyone is expected to display courtesy and respect - see Science Olympiad Pledges. Teams are expected to make an honest effort to follow the rules and the spirit of the problem (not interpret the rules so they have an unfair advantage). Failure by a participant, coach, or guest to abide by these codes, accepted safety procedures, or rules below, may result in an assessment of penalty points or, in rare cases, disqualification by the tournament director from the event, the tournament, or future tournaments.

1. Actions and items (e.g., tools, notes, resources, supplies, electronics, etc.) are permitted, unless they are explicitly excluded in the rules, are unsafe, or violate the spirit of the problem.
2. While competing in an event, participants may not leave without the event supervisor's approval and must not receive any external assistance. All electronic devices capable of external communication as well as calculator applications on multipurpose devices (e.g., laptop, phone, tablet) are not permitted unless expressly permitted in the event rule or by an event supervisor. Cell phones, if not permitted, must be turned off. At the discretion of the event supervisor, participants may be required to place their cell phones in a designated location.
3. Participants, coaches and other adults are responsible for ensuring that any applicable school or Science Olympiad policy, law, or regulation is not broken. All Science Olympiad content such as policies, requirements, clarifications/changes and FAQs on www.soinc.org must be treated as if it were included in the printed rules.
4. All pre-built devices presented for judging must be constructed, impounded, and operated by one or more of the 15 current team members unless stated otherwise in the rules. If a device has been removed from the event area, appeals related to that device will not be considered.
5. Officials are encouraged to apply the least restrictive penalty for rules infractions - see examples in the Scoring Guidelines. Event supervisors must provide prompt notification of any penalty, disqualification or tier ranking.
6. State and regional tournament directors must notify teams of any site-dependent rule or other rule modification with as much notice as possible, ideally at least 30 days prior to the tournament.

COVID-19 PANDEMIC RULES MODIFICATIONS

The COVID-19 pandemic requires that some general modifications be made to the Event Rules listed in this manual in order to permit Science Olympiad competitions to continue in a way that reflects best public health, disease prevention, and personal safety practices. The modifications listed here will be in effect for all Science Olympiad competitions, regardless of level (e.g., Invitational, Regional, State, National), or type (e.g., In-Person, Satellite SO, mini SO). As the pandemic is evolves, these modifications may be amended or rescinded according to local conditions. If changes are made, the Tournament Director for the affected tournament will make an announcement to all participating teams as soon as possible.

1. **If not already allowed, each individual participant can have a personal set of reference materials (e.g., binders, single sheets of paper), calculator, or other academic resource as specified in the specific event rule for use during the competition to facilitate social distancing, isolation, and to prevent resource sharing. Personal sets of resource materials must meet all the criteria established in the specific event rule. This does not apply to Recommended Lab Equipment for Division B or Division C Chemistry Events or tool kits for Build Events.**
2. **Given local conditions, participants may not be able to be in the same location as their partner during competition. Tournaments will allow designated partners to compete from separate locations and competing teams will only need one device for Build or Hybrid with Build Events.**
3. **At the discretion of the Tournament Director, portions of Hybrid Events containing hands-on activities as well as Build and Lab Events may be dropped from the tournament or be conducted as trial events.**
4. **At the discretion of the Tournament Director and Event Supervisors, completion time may be used as a tiebreaker for Core Knowledge and other events where a written or online test is used.**



For Event Supervisors Only - Do Not Post
CHEMISTRY RECOMMENDED LAB EQUIP.

See General Rules, Eye Protection & other Policies on www.soinc.org as they apply to every event.

Each team may bring any or all of the items listed below for use in Division B Chemistry Events. Teams not bringing these items will be at a disadvantage as Event Supervisors will not provide Recommended Lab Equipment. A penalty of up to 10% may be given if a team brings prohibited lab equipment to the event.

| Item & Expected Use | Likely to be used in: | | | |
|---|-----------------------|----------------------|--------------|---------------------|
| | Crime Busters | Can't Judge a Powder | Food Science | Potions and Poisons |
| Box - Containing all of the kit materials | X | X | X | X |
| 10 ml Graduated Cylinder - Measuring volumes | | X | X | X |
| 25 ml Graduated Cylinder - Measuring volumes | | X | X | X |
| 100 ml Graduated Cylinder - Measuring volumes | | X | X | X |
| 50 ml Beakers - Doing reactions, developing chromatograms | X | X | X | X |
| 100 ml Beakers - Doing reactions, developing chromatograms | | X | X | X |
| 250 ml Beakers - Doing reactions, developing chromatograms | | X | X | X |
| 400 ml Beakers - Doing reactions, developing chromatograms | X | X | X | X |
| 50 ml Erlenmeyer Flasks - Doing reactions | | X | X | X |
| 125 ml Erlenmeyer Flasks - Doing reactions | | X | X | X |
| 250 ml Erlenmeyer Flasks - Doing reactions | | X | X | X |
| Test Tubes - Mix Chemicals, heat chemicals | X | X | X | X |
| Test Tube Brush - Clean Test Tubes | X | X | X | X |
| Test Tube Holder - Holds test tubes for heating | X | X | X | X |
| Test Tube Rack - Hold Test Tubes | X | X | X | X |
| Petri Dishes - Doing reactions, developing chromatograms | X | X | X | X |
| Spot Plates - Doing reactions in semi-micro scale, testing solubility, pH | X | X | X | X |
| Slides - To put hairs, crystals, or fibers on for use with a microscope | X | | | |
| Cover Slips - To prevent items from coming off slides | X | | | |
| Droppers - Add small amounts of liquids to reactions | X | X | X | X |
| Spatulas or spoons - Getting small amounts of solids out of containers | X | X | X | X |
| Stirring Rods - Stirring mixtures | X | X | X | X |
| Thermometer - Determining the temperature of a solution | | X | X | X |
| Metal Tongs, Forceps, or Tweezers - Holding objects, retrieving objects from liquids | X | X | X | X |
| pH or Litmus paper - Test acidity or alkalinity of solution | X | X | X | X |
| Hand Lens - Magnification of small items for identification | X | X | | |
| 9V or less Battery Conductivity Tester - Determining ionic strength of solution | | X | X | X |
| Paper Towels - Cleaning | X | X | X | X |
| Pencil - Writing, Marking Chromatogram | X | X | X | X |
| Ruler - Measuring lengths | X | X | X | X |
| Magnets - For extraction and identification of iron filings | X | X | X | X |



For Event Supervisors Only - Do Not Post CALCULATOR CLASS DESCRIPTIONS

See General Rules, Eye Protection & other Policies on www.soinc.org as they apply to every event.

The following document was prepared to offer some guidance to teams as they select calculators for use in different Science Olympiad events. By no means are the calculators listed here inclusive of all possible calculators; instead they are offered as common examples. The decisions of the event supervisors will be final.

Class I - Stand-alone non-graphing, non-programmable, non-scientific 4-function or 5-function calculators

are the most basic type of calculators and often look like the one shown to the right. These calculators are limited to the four basic mathematics functions and sometimes square roots. These calculators can often be found at dollar stores.



Class II - Stand-alone non-programmable, non-graphing calculators look like the calculator to the right or simpler. There are hundreds of calculators in this category but some common examples include: CASIO FX-260, Sharp EL-501, and TI-30X.



Class III- Stand-alone, programmable, graphing calculators and stand-alone non-graphing, programmable calculators, often look like the calculator shown on the right. Some examples are: Casio 975 0/9850/9860, HP 40/50/PRIME, and TI 83/84/89/NSPIRE/VOYAGE.

To identify a stand-alone non-graphing, programmable calculators are look for the presence of the 'EXE' button, the 'Prog' button, or a 'file' button. Examples include but are not limited to: Casio Super FXs, numerous older Casio models, and HP 35S. A calculator of this type with the buttons labeled is shown to the right.



PROG Button

EXE Button



Class IV - Calculator applications on multipurpose devices (e.g., laptop, phone, tablet, watch) are not allowed unless expressly permitted in the event rule.



EYE PROTECTION GUIDE

See General Rules, Eye Protection & other Policies on www.soinc.org as they apply to every event.

This resource was created to help teams comply with the Science Olympiad Policy on Eye Protection adopted on July 29, 2015 and posted on the Science Olympiad Website (soinc.org).

Participant/Coach Responsibilities: Participants are responsible for providing their own protective eyewear. Science Olympiad is unable to determine the degree of hazard presented by equipment, materials and devices brought by the teams. Coaches must ensure the eye protection participants bring is adequate for the hazard. All protective eyewear must bear the manufacturer's mark Z87. At a tournament, teams without adequate eye protection will be given a chance to obtain eye protection if their assigned time permits. If required by the event, participants will not be allowed to compete without adequate eye protection. This is **non-negotiable**.

Corresponding Standards: Protective eyewear used in Science Olympiad must be manufactured to meet the American National Standards Institute (ANSI) standard applicable at its time of manufacture. The current standard is ANSI/ISEA Z87.1-2015. Competitors, coaches and event supervisors are not required to acquire a copy of the standard. The information in this document is sufficient to comply with current standards. Water is not a hazardous liquid and its use does not require protective eyewear unless it is under pressure or substances that create a hazard are added.

Compliant Eyewear Categories: If an event requires eye protection, the rules will identify one of these three categories. Compliance is simple as ABC:

CATEGORY A

- Description: Non-impact protection. They provide basic particle protection only
- Corresponding ANSI designation/required marking: Z87
- Examples: Safety glasses; Safety spectacles with side shields; and Particle protection goggles (these seal tightly to the face completely around the eyes and have direct vents around the sides, consisting of several small holes or a screen that can be seen through in a straight line)

CATEGORY B

- Description: Impact protection. They provide protection from a high inertia particle hazard (high mass or velocity)
- Corresponding ANSI designation/required marking: Z87+
- Example: High impact safety goggles

CATEGORY C

- Description: Indirect vent chemical/splash protection goggles. These seal tightly to the face completely around the eyes and have indirect vents constructed so that liquids do not have a direct path into the eye (or no vents at all). If you are able to see through the vent holes from one side to the other, they are NOT indirect vents
- Corresponding ANSI designation/required marking: Z87 (followed by D3 is the most modern designation but, it is not a requirement)
- Example: Indirect vent chemical/splash protection goggles

Examples of Non-Compliant Eyewear:

- Face shields/visors are secondary protective devices and are not approved in lieu of the primary eye protection devices below regardless of the type of vents they have.
- Prescription Glasses containing safety glass should not be confused with safety spectacles. "Safety glass" indicates the glass is made to minimize shattering when it breaks. Unless these glasses bear the Z87 mark they are not approved for use.

Notes:

1. A goggle that bears the Z87+ mark and is an indirect vent chemical/splash protection goggle will qualify for all three Categories A, B & C
2. VisorGogs do not seal completely to the face, but are acceptable as indirect vent chemical/splash protection goggles