2019 Event Logistics Manual

SCIENCE OLYMPIAD

2019 EVENT LOGISTICS MANUAL

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Thanks to all the National Event Supervisors and State Directors who helped provide content for this manual.

Introduction

So, you are going to be a Science Olympiad Event Supervisor or an Event Volunteer. Thank You and Congratulations! You are stepping into the role that has the most impact on participants' Science Olympiad experience while at the same time offering some of the best opportunities to share your STEM knowledge and passion with students.

To help you in this role there are several key sources of information that Science Olympiad produces you need to be aware of and review. First are the event rules. If you haven't done so already, you can access a digital copy of the rules for your Division here for free. All Event Supervisors are encouraged to review both the General Rules, found in the Rules Manuals and Appendix A of this book, and specific event rules found in the manual, as both rule sets apply to your event. Second, make sure to visit the official Science Olympiad web site (www.soinc.org) often for Clarifications/Rules Changes and Frequently Asked Questions that may apply to the event that you are to supervise. Also, on the web you can find additional information such as checklists, scoresheets, and guidelines about your event on its Event Page. Third, you have this Logistics Manual which provides highlights of key information concerning your event as well as some general pieces of advice and guidance that will help make your experience as an event supervisor easier and more enjoyable.

As an event supervisor, you are responsible for **all aspects** of the event including but not limited to:

- familiarity with event rules, General Rules, Rules Clarifications and FAQ's on the National website. Students/coaches will have read the rules many, many times. Be sure you have done the same thing;
- working with the tournament director and host site to ensure all equipment, tests, and materials needed to run the event are in hand;
- approving and setting up event space;
- printing scoresheets and any additional paperwork required for the event;
- if necessary, developing and printing copies of test and answer sheets for students and answer keys for volunteer graders;
- starting and ending the event on time; and,
- coordinating roles and activities of any volunteers assigned to your event.

If you have any questions about expenses and materials, volunteers, meals, tournament shirts or submitting materials (e.g.; tests, answer sheets) for copying or archiving you should contact your tournament director in advance of the tournament.

When it comes to the day of the tournament, we would advise you to:

- Check all equipment ahead of time. All equipment should be the same for teams and in working order.
- Give yourself ample time to set up for your event; if at all possible, try to set up event the day before.
- Make sure the event is run so ALL participants have the same conditions for competition.
- **Be Flexible-** participants are young, excited, and unfamiliar with campus. Whenever possible, let students compete even if they're late. But if they do arrive late, they should not be given extra time to finish. They should only finish what they can do in the time since arrival.
- Read over the rules and make sure you understand them. The students will know them very well!
- Familiarize yourself with the Rules Clarifications and FAQ's, they apply to all states and all tournaments and originate at the national level.
- Make sure you understand how the scoring criteria work.
- Remember that the RULES, INCLUDING THE GENERAL RULES, ALWAYS TAKE PRECEDENCE.
- If your event room has windows to the hall or in the door these windows should be covered.

Guidelines for Events with Written Tests

If your event should happen to feature a written test, please consider the following suggestions to facilitate a better testing experience and easier scoring.

- Write the event so that the questions, or activities, align to the event rules. Make sure to include a mix of difficulty within your activities so that about 15% of them are easy, 60% of them are of medium difficulty, and 25% are difficult.
- Avoid questions that are overly tricky or delve into trivial topics. Difficult does not mean tricky or trivial.
- Arrange your test so that it has a cover sheet which identifies the Event Name, Division, and Tournament date.
- Follow the cover sheet with a page that contains instructions on how answers should be recorded, how much time the participants have to complete the test, if they may write on the test packet, and any resources they may or may not use. Questions should follow on subsequent pages. This arrangement will allow participants to look at the instructions and ask any questions they may have without seeing the test questions.
- Questions and pages all should be sequentially numbered so participants will notice if a page is missing.
- Follow good test and question organization and structure. For example, questions and answers should not cross pages. For multiple choice – indicate "Select best answer" or "All that apply".
- Evenly space out, align, and size answer boxes where participants should write their responses.
- Make sure each question's point value reflects the information that you expect the participants to provide as an answer. For example, a question asking the participants to name the 3 bones found in the human ear should be worth 3 points with the correct name for each bone being worth a single point.
- Make sure to select questions so that no one can get every question correct. If several teams get every question correct, it is difficult to determine the final placement of a team.
- Have a header on each page which includes a space for the participants to write their team name and team number as well as their own names in case the pages separate.
- Have a footer that shows the page number and has space to record the total score for that page. Try to alternate the position left to right to make it easier to record the information on double-sided documents.
- Include a page at the end that has a place to record the totals from each page. This will facilitate calculating the sum of page totals and make it easier to find errors.
- Announce the amount of time left periodically (i.e., 30, 15, 10, 5 minutes).
- Provide staple pullers and staplers so that teams can separate events if they wish. Teams that separate the test should reassemble and staple them – missing pages are the responsibility of the team and not event staff.
- Use sign in sheets and check them to make sure that teams without grades did not show.

Guidelines for Events with Labs

If your event is best suited to be an experimental activity, or a rotation through a variety of laboratory stations, consider these suggestions to make sure participants have the best experience possible.

- Periodically notify teams of the amount of time remaining in the event.
- Make sure to provide instructions on how to clean up the laboratory space or laboratory stations.
- Model and enforce proper safety precautions and safety equipment usage.
- Prepare a rubric in advance to help you consistently score the participants' work.

Guidelines for Events with Labs (continued)

- Consider using an even number scale for your rubric (e.g.; 4 points, 6 points, or 8 points) to help avoid ties.
- Have a system for breaking all ties.
- Write an answer for essay questions that you consider ideal.
- Identify factors that make it ideal.
- Determine the number of points for an ideal score.
- Determine what constitutes awarding few points.
- If different people are grading the reports, it is recommended that the same person grades the same part of the test. Having different people grade the entire test often results in unfair grading and should be avoid if at all possible.
- Include as much hands-on application as possible.
- Ensure there is a place for names and team numbers on all paper testing materials.
- Once judging begins, if a student leaves the testing room for any reason, he/she cannot return.
- All activities must begin and end on time. Do not give any extra time as this could make students late for their next event and this practice will not be consistent for all teams.

Guidelines for Building Events

- Identify all materials and equipment needed to carry out activities or test/measure events.
- Any equipment or materials that are not specified in the rules for the students to bring MUST be supplied by the event supervisor.
- Let your tournament director know as soon as possible if there are items you need but are having difficulty sourcing on your own.
- Consider using painter's tape instead of masking tape for marking dimensions on floors as it is much easier to remove.
- Most building events specify tie breakers in their rules. If one is not specified, you will need to designate a tie breaker before the tournament.
- Make sure students have their team numbers and names on all devices. Handle the devices as little as possible to avoid accidental damage.
- Have a checklist of things to check for each team/device.
- Make sure you have sufficient time to judge devices and determine if there are any construction violations before teams compete.
- For devices that are required to fit in a 3-D box, having a physical box of the desired dimensions is a quick way of making this judgement.
- For events that have other specific dimensions, consider building a measuring scale out of pasteboard. Much easier than measuring the device with ruler/tape.
- Do not release times, distances, or other pertinent information prior to impounding.
- Begin as close as possible to the time indicated on the event schedule.
- Read and follow the event rules carefully.
- If a device is judged to have a construction violation, the team should be notified immediately as to the exact nature of the violation.
- As the Event Supervisor, decide if you will allow teams to make minor adjustments to devices to eliminate construction violations. Whatever you decide, please be consistent.
- Students may not confer with spectators or be coached in any way.
- Do not allow students to compete without proper safety equipment.

Guidelines for Building Events (continued)

- Check that only materials allowed by the rules are brought in by students.
- Once judging begins, if a student leaves the testing room for any reason, he/she cannot return.
- If a team fails to show up for its sign-up time for a legitimate reason, the Event Supervisor can (but does not have to) allow them to be judged during a different time slot.

Key Terms

Event Name: Indicates how the event should appear in programs, schedules, and awards ceremonies. It is followed by the Division or Divisions in which the event is currently being run.

Impound: Indicates if any items associated with the event need to be collected and sequestered prior to any events starting on tournament day. If Impound is required, this will require additional space to securely hold the impounded items. It will also require additional volunteers to manage and supervise Impound throughout the tournament.

Room Type: Describes the types of classroom spaces in which the event can be successfully run.

Estimated Hours of Prep Time (including set-up): This is an estimate of the amount of time required of an event supervisor to prepare the needed event materials and set up the event space prior to the arrival of participants at the tournament.

Minimum Suggested Supplies: This is a description of the minimal amount of materials that an event supervisor needs to have in order to successfully run the event at a tournament. It reflects the items listed in the Event Parameter, and other sections, of the Event Rules.

Helpers: Indicates how many adult volunteers, in addition to the Event Supervisor, are needed to successfully run the event. Depending upon the event, these Helpers do not necessarily need a specialized science background. Often times, a general science background and experience working with and supervising children will suffice. In some cases, when the event has two parts running simultaneously (e.g.; Hovercraft, Thermodynamics) additional event supervisors are needed and are called out here.

Additional Notes: This section shares special notes and tips from experienced Event Supervisors, Tournament Directors and Rules Committee Members. Often you can find ideas that will improve the event and offer some time savings for new supervisors.

Notes on Scheduling Events

Try to schedule the following events as early as possible in the day to give Event Supervisors as much time as possible to score all student work:

- Experimental Design
- Disease Detectives
- Write It, Do It (WIDI)

Disease Detectives, Experimental Design, and WIDI are likely to have the same students participating in each event. If possible, try to not schedule all the events at same time for one team. Disease Detectives can probably be a bit more flexible.

It is recommended that device events should be scheduled using a sign-up system as opposed to allowing walk-ins because walk-ins tend to create large clusters of teams at the end of the day. Ideally these sign-ups would be done online, at least one week prior to the tournament. Tournament directors should consider activating sign ups on different days and different times to ensure that teams signing up have equal

opportunity and access to sign-up for slots. If at all possible, arrange the sign-up process so that a single person from a team can sign-up participants for all events.

Notes on Resources & Supplies

For more Information about coaches and supervisor sets of bulk supplies for many events, see the official site for Science Olympiad-approved kits: Ward's Science -- https://www.wardsci.com/scienceolympiad. Early bird savings: Save 12% on your Ward's Science Olympiad Kit Order with the promo code – SOVIP2018 until 12/31/18.

For more information about obtaining probes, sensors, photogates, calculators and other tech, use the Texas Instruments Educator Loan Program:
http://education.ti.com/educationportal/sites/US/nonProductMulti/support_borrowtitechnology.html

Anatomy & Physiology (B & C)

Impound: No

Room Type: Biology lab/room with flat tables

Estimated Prep Time (including set-up): 8-12 hours

Helpers: 1-2

Event Conflicts: None

Minimum Suggested Supplies

Microscopes and slides; models, pictures of organs or pictures of an individual suffering from a disease. If you have access to models, or dissected organs, consider using them instead of pictures.

Additional Notes

- This event is ideally done at stations; overheads and internet pictures may be used in a pinch.
- At least one station should include some actual data in graph or table form.
- Students should not be allowed to touch the specimens.
- Content of questions should focus on understanding how structure contributes to function, and how structures work together, rather than simple identification.
- Care should be taken that slides, pictures, samples and specimens are clearly and unambiguously marked with precise locations.
- Please be aware that many anatomical structures have more than one name so Keys or labels should contain all applicable names for a structure to allow proper grading.
- If using probeware, be sure to include directions for the participants on how to use the device.
- Additional guidance and resources for Event Supervisors may be found on the Event Pages for Division B and Division C at soinc.org.

Astronomy (C)

Impound: No

Room Type: Large classroom with projection capabilities; large flat surfaces

Estimated Prep Time (including set-up): 8-12 hours

Helpers: 1-2

Event Conflicts: Dynamic Planet

Minimum Suggested Supplies

Web/LCD projection capabilities, large projection screen; many different astronomy images

Additional Notes

- This event is ideally done as a group test with images projected for all to see.
- There should be more than 1 question for every image.
- Additional guidance and resources for Event Supervisors may be found on the Event Page at soinc.org.

Battery Buggy (B)

Impound: Yes

Room Type: Wide, flat hallway, gym, or other open indoor space; space for impound at all tournaments

Estimated Prep Time (including set-up): 2-4 hours

Helpers: 2-4

Event Conflicts: None

Minimum Suggested Supplies

Tables for Impound; Rope/Safety Tape/Barriers to separate course/impound from spectators; Tape to mark course; measuring tapes; stop watches; large mass balance; Swiffer/Broom to clean the floor; Photogate timing system, if possible. If not using a photogate system, have 2 lasers set up at the timing lines for ease of the timers to see when the dowel passes the timing lines.

Additional Notes

This event is best run in a big space where the impound area and participants can be kept separated from spectators. Rope, or some other queuing device, should be used to designate where spectators are allowed off the area to keep spectators away. If you have a large number of teams competing, consider setting up additional but identical courses.

To be successful, a smooth surface is paramount. Avoid tile floors with seams. Notify teams ahead of the tournament, via email or a tournament website, the type of surface (e.g., vinyl, wood, concrete) that will be used. Also, emphasize with coaches in ample time before the competition that manufacturer voltage must be clearly marked. Do not tell target distance until all devices impounded. Make sure course is clearly taped off as described in rules.

Additional guidance and resources for Event Supervisors may be found on the Event Page at soinc.org.

Boomilever (B & C)

Impound: No

Room Type: Gym or room with tables

Estimated Prep Time (including set-up): 2-4 hours

Helpers: 2 -4

Event Conflicts: None

Minimum Suggested Supplies

- A Testing Wall as described in the event rules Section 5. Test Apparatus. If at all possible, consider having more than one to accommodate a higher number of teams per session. If using additional Testing Walls, make sure to increase the number of the items that follow accordingly.
- Two 5-gallon plastic buckets with handle. One to hold the sand and another to suspend from the Boomilever and fill with sand.
- A small (pint to quart size) scoop/cup to transfer sand to bucket
- Pair of bucket stabilizing sticks as described in the rules (5.d.)
- 15.1 Kg Sand
- A Loading Assembly as described in the rules (5.b.)
- A digital timer to measure the 6-minute event time
- Another bucket or bag to hold excess sand to replenish competition sand if/when it spills
- Scale to mass the Boomilever (accurate to 0.01 grams) (up to 50 or 100 grams)
- Scale to mass sand bucket/chain system (hold at least 15.2 Kg) accurate to at least .1 Kg
- A level to make sure the attached Boomilever is level

Additional Notes

Consider doing as a sign up and/or with multiple testing. Need to use sand and not cat litter. Sand must be dry!

Additional guidance and resources for Event Supervisors may be found on the Event Pages for Division B and Division C at soinc.org.

Chemistry Lab (C)

Impound: No

Room Type: Chemistry Lab

Estimated Prep Time (including set-up): 10-15 hours

Helpers: 1-2

Event Conflicts: Forensics, Material Science

Minimum Suggested Supplies

Appropriate chemicals for all; various types of glassware; proper disposal containers.

Additional Notes

Long set-up and prep; need many sets of reagents, ideally one for each group; **be sure students and supervisors come with proper safety equipment.** If using probes, students may need directions on how to use. Students may have 5 notes sheets.

FOR ALL CHEM EVENTS SEE SUPERVISOR TIPS on www.soinc.org.

Circuit Lab (B & C)

Impound: No

Room Type: Ideally a science lab but a large classroom with tables can work

Estimated Prep Time (including set-up): 10-12 hours

Helpers: 2-4

Event Conflicts: None

Minimum Suggested Supplies

Multimeter, Materials appropriate for the hands-on activity you choose (i.e.; breadboards, LEDs, wire, resistors, batteries, magnets, motors, compasses, light bulbs, and switches), Written Test, Key, & Answer Sheets

Additional Notes

Ideally, Circuit Lab would be run as a series of stations where participants rotate to answer questions and complete a series of tasks. Given that the hands-on portion of the event can count anywhere from 25% to 50% of a team's final score, Event Supervisors are strongly encouraged to not use a single hands-on activity. Ideally there would be multiple small things for teams to complete over the course of the event either at each team's location or by rotating between stations with at least 5 minutes at each station.

If your space or materials are limited, consider having the teams all work on the written test at the same time and then call them up one at a time for your hands-on station to complete a series of tasks. You will want at least one supervisor who is good at writing and grading tests and another supervisor who is good with hands-on activities.

- Additional guidance and resources for Event Supervisors may be found on the Event Pages for Division B and Division C at soinc.org.

Codebusters (C)

Impound: No

Room Type: Typical classroom with chalk/whiteboard

Estimated Prep Time (including set-up): 8-10 hours

Helpers: 3 - 5

Event Conflicts: None

Minimum Suggested Supplies

Written Test, Key, Answer Sheets; stopwatch(es) or stopwatch app on smartphone; stapler, and scrap paper

Additional Notes

For help preparing your test, please check out these resources:

- Test-Creation Tool: https://toebes.com/codebusters
- Test-Creation Tool Instructional Video: https://youtu.be/pcz_3ql8ebM

Event Preparation

You will need:

1. Sufficient copies of the test for all teams (one booklet per team). They don't need to be stapled.
2. Folders for each of the teams to hold the tests.
3. Multiple timers which have a lap function on them - ideally one per volunteer. The timer app on an iPhone or Android Phone that has a stopwatch function with lap function is sufficient.
4. Optionally, extra scrap paper for any team that needs it.

Before the event begins:

1. Practice starting the timers and using the lap function to record the times. Make sure volunteers understand how to use the lap function and are not accidentally stopping the timer completely.
2. Memorize the answer to the timed question.
3. Place one copy of the test for each team in the provided folders with the first page outside the folder (fastened with a paperclip, for example)
4. When specifying which cipher to use (as it is the first year for this event) it is recommended that you should provide enough information as to make the event accessible to all participants. For example, if you were to use an Aristocrats cipher with spelling errors you would identify it as such but not specify the number of errors. Similarly, a message encrypted using the Atbash cipher should indicate that the Atbash was used.

Running the Event

1. When the students enter the room, instruct them to sit down, DO NOT OPEN THE FOLDER, and put their names, school name and school number on the first page.
2. CRITICAL: Check to see that students have ONLY brought:
    a. Something to write with (pencils, pens, erasers)
    b. Five function calculators (addition, subtraction, multiplication, division, and usually square root). The calculator can have a simple memory store/recall function but must not have a modulus or other scientific and programmable functions. If their calculator doesn't meet these requirements, they may not use it.

3. Remind the teams that:
    a. They do not have to fill in the frequency table. It is simply there as an aid to help them solve the cryptogram. It will not be graded.
    b. They are not restricted to only the timed question during the first 10 minutes of the event. They can move on or split up the work if they would like.
    c. They will need to staple their test booklets after the event is over.
    d. Writing anything after "time is called" at the end can lead to a penalty or disqualification.
4. Instruct the students that if they answer the timed question within 10 minutes, they can be awarded a bonus if they solve the timed question with no more than 2 letters incorrect.
    a. Let them know that you will announce when the 10-minute time is up. After the first 10 minutes, no additional bonus points will be awarded.
    b. When they have a solution for the cryptogram they should raise their hand.
    c. When you see a team raise their hand, hit the LAP function and head to the team.
    d. Determine if their answer is correct (see next page for grading), If so, write the time on their score sheet.
    e. If their score is incorrect (more than 2 letters incorrect), tell the team that the answer is wrong, but DO NOT tell them what is wrong. They can continue to work on the question and raise their hand again to be checked. A team has an unlimited number of attempts during the 10-minute bonus.
5. When the timers hit the 10-minute point, put away the timers, and announce that no bonus points will be awarded but the students can still solve the question for its fixed-point value.
6. When time is up, have the students put writing instruments down and put their answer pages back into the folder in the correct order.

How to grade

1. Teams can have up to two incorrect letters total on their cryptogram and still be correct. See the example below.

    If the cryptogram was as shown:
    Given Cryptogram - KZBAOF KFXMFXYF
    Correct Response - SAMPLE SENTENCE
    and the participants answered (underlined letters indicate mistakes)
    Participant Response #1 - SAMPL<u>F</u> S<u>F</u>NT<u>F</u>NC<u>F</u>
    then it counts as four mistakes (even though the mistake was only in the letter E) and the answer DOES NOT count. However, if they put
    Participant Response #2 - SAMP<u>UL</u> SENTENCE
    It is considered correct with two letter mistakes.

2. For questions which have a numeric answer (such as determining the a= and b= values or the RSA questions), no mistakes are allowed.
3. Teams do NOT have to fill in the frequency table. It is simply there as an aid to them solving the cryptogram. It WILL NOT be graded. It is included in the answer key as an aid to the grader.
4. When scoring the Baconian ciphers (with strange text or symbols), they can write the answer under the Baconian symbols or on the line provided. Note that you will see lots of As and Bs, but they are not graded as the answer, only what they put on the answer line.
5. As you score each question, if correct, put the number of incorrect letters (0, 1, or 2) next to the question number on the scoring page. Also, put the value for the question into the score column. If they get more than 2 letters wrong, subtract 100 points from the score until it would be zero. If a

question is worth 240 points and they get 4 letters wrong, you would start with 240 points (for up to 2 letters wrong) and then subtract 100 points for the next two letters wrong ending up with a final score of 40 points for that question. If they get 5 or more letters wrong on a 240 point question, they receive 0 points for that question. With a 650 point question, they could get 8 letters wrong and receive 50 points (2 free letters then 6×100=600 points off). Just put the incorrect cost deduction on the score sheet and subtract it from the value for the question. Under no circumstance should the score for any question be less than zero. Note that while the timed question must have 2 or fewer letters incorrect in order to get the timing bonus, a team solving the timed question after the 10 minutes passed would be accepted as correct with 3 incorrect letters receiving 100 points for the timed question.

6. If they correctly answered the timed question in 10-minutes or less with 2 or fewer letters incorrect, you need to compute the bonus time. Take the value for the minute from this first table below:

0:xx	2,160		1:xx	1,920		2:xx	1,680		3:xx	1,440		4:xx	1,200
5:xx	960		6:xx	720		7:xx	480		8:xx	240		9:xx	0

and then add the seconds value from this table:

x:00	240		x:00	236		x:00	232		x:00	228		x:00	224		x:00	220
x:06	216		x:06	212		x:06	208		x:06	204		x:06	200		x:06	196
x:12	192		x:12	188		x:12	184		x:12	180		x:12	176		x:12	172
x:18	168		x:18	164		x:18	160		x:18	156		x:18	152		x:18	148
x:24	144		x:24	140		x:24	136		x:24	132		x:24	128		x:24	124
x:30	120		x:30	116		x:30	112		x:30	108		x:30	104		x:30	100
x:36	96		x:36	92		x:36	88		x:36	84		x:36	80		x:36	76
x:42	72		x:42	68		x:42	64		x:42	60		x:42	56		x:42	52
x:48	48		x:48	44		x:48	40		x:48	36		x:48	32		x:48	28
x:54	24		x:54	20		x:54	16		x:54	12		x:54	8		x:54	4

For example if they solved the time question at the 6:46 mark, you would add 720 (from the 6:xx entry in the first table) to 56 (from the X:46 entry in the second table) to get a bonus of 776. If they had solved it in exactly 4:00 minutes, you would add 1200 and 240 to get a bonus of 1440.

7. Add up all the scores and put the total on the bottom of the score sheet.
8. You must break all ties. Indicate the tie breaker by adding .1 to the score of the team ahead. With multiple teams tied, you will add more. I.e. if five teams all scored 200 points, the final scores that you would enter on the score sheet would be 200.4, 200.3, 200.2, 200.1 and 200.
9. To determine how to break the tie, you need to look at the correctly answered questions in the order from the table generated with the test. If both teams answered the same (i.e. they answered the question with zero mistakes) then you go on to the next question. If one team had no mistakes and the other team had one mistake, then the team with no mistakes is ahead. Using the table below as an example, if one team answered question #8 (which is the highest value question) and another team didn't, the first team will be ahead.

Tie Breaker Order	Question #
1	12
2	8
3	7
4	6
5	17
6	5
7	11
8	14
9	4
10	18
11	15
12	3
13	Timed
14	19
15	16
16	20
17	13
18	10
19	9
20	2
21	1

10. If there is still a tie (typically when you have teams which answered either zero, one or two questions) then you will need to look at the tie breaker questions again and count the number of correctly answered letters. The team with the most correctly matched letters is to be ahead.

Additional guidance and resources for Event Supervisors may be found on the Event Page at soinc.org.

Crime Busters (B)

Impound: No

Room Type: Chemistry Lab

Estimated Prep Time (including set-up): 10-20 hours

Helpers: 2-4

Event Conflicts: Potions & Poisons

Minimum Suggested Supplies

Appropriate Chemistry lab supplies: Iodine reagent (Iodine dissolved in KI solution), 1M HCl, a waste container, thermometers, balances, reagents, usually at each station; chromatography supplies, pens; shoe prints. Hair, fabric and candles, plastics and density determining supplies. Distilled or ROI water for each team in wash bottle, unknowns.

Additional Notes

You will need many sets of reagents & supplies; a long prep time is associated with this event. There should be the same setup for each station and team. There are no heating tasks in this event.

You should consider using many different pens with black ink rather than different colored pens; consider a scenario in which any or none could be the perp; same size shoe prints but worn differently creates a different scenario. Test template, recipes for reagents, and other helpful hints available.

At all times, the participants and supervisors need to use proper safety equipment. Participants will come with proper safety equipment.

For all Chem events see Supervisor Tips on http://www.soinc.org/.

Density Lab (B)

Impound: No

Room Type: Ideally a science lab but a large classroom with tables can work

Estimated Prep Time (including set-up): 10-12 hours

Helpers: 2-4

Event Conflicts: None

Minimum Suggested Supplies

Written Test, Key, & Answer Sheets; Materials and measurement devices appropriate for the hands-on activity you choose (e.g. mass scales/balances, rulers, graph paper, graduated cylinders, beakers, water, balloons, aquarium tank)

Additional Notes

If your space or materials are limited, consider having the teams all work on the written test at the same time and then call them up one at a time for your hands-on station. You will want at least one supervisor who is good at writing and grading tests and another supervisor who is good with hands-on activities.

Also, make sure that you are aware of, and follow, any and all safety and housekeeping rules established by the institution that is hosting the tournament.

Additional guidance and resources for Event Supervisors may be found on the Event Page at soinc.org.

Designer Genes (C)

Impound: No

Room Type: Ideally a science lab but a classroom with large tables can work as well

Estimated Prep Time (including set-up): 10-20 hours to prepare the test; 1-2 hours day of to set-up the room

Helpers: 2-4

Event Conflicts: None

Minimum Suggested Supplies

Written Test, Key, & Answer Sheets; Stopwatch(es), samples or specimens (i.e. slides, pictures, karyotypes, diagrams, pedigrees, corn ears, beans, plants) if appropriate

Additional Notes

Ideally this event should be run as stations where participants get to interact with specimens, samples, or data to answer multiple questions. Use the number of teams per session as a guide to how many stations you will need. Typically, you would like to have more stations than you do teams. If using stations, participants should get about 4 minutes/station if you have 10 to 12 stations or 3 minutes/station if you have 15.

Try to include some graphs, interpretation of data, predictions across the stations.

Additional guidance and resources for Event Supervisors may be found on the Event Page at soinc.org.

Disease Detectives (B & C)

Impound: No

Room Type: Science Lab or Classroom

Estimated Prep Time (including set-up): 10-15 hours

Helpers: 2-4

Event Conflicts: None

Minimum Suggested Supplies

1 copy of test/team, Answer sheet for quick grading, stapler, staple puller

Additional Notes

Competitors should not be expected to know facts such as latency or incubation periods or causative agents about diseases or conditions. These should be provided in background information or the body of the question. However, they should be able to recognize, use and interpret that information when given in different forms.

Minimize duplicate calculations as much as possible. Avoid having teams calculate risk ratios for 10 different items in an outbreak investigation. This unreasonably rewards or penalizes teams who are able or unable to do it. One or two should be adequate.

In developing short answer and short essay questions, it is a good idea to give some indication of just what the answer should look like. For example, "Person, place and time are key to descriptive epidemiology. Gender and age are two variables associated with person. Give two variables associated with place and two variables associated with time".

The test associated with this event can take a long time to grade so consider scheduling this as the first event of the day; an alternative would be to recruit more volunteers than listed to serve as additional scorers. During the event, some graphs may be projected, but it is not a good idea for students who may need to return to them often.

The event has been run as stations with 10 or fewer teams in a laboratory setting. Stations were not order-dependent. Teams were given 3-4 minutes at each station. Stations requiring more time were duplicated so that teams just moved down but kept doing the same thing.

Additional guidance and resources for Event Supervisors may be found on the Event Pages for Division B and Division C at soinc.org. Many more resources, help, and information can be found at the CDC website.

Dynamic Planet (B & C)

Impound: No

Room Type: Large room with flat tables

Estimated Prep Time (including set-up): 10-15 hours

Helpers: 1-2

Event Conflicts: Astronomy, Ecology, Herpetology, Meteorology

Minimum Suggested Supplies

Enough copies of tests; actual maps/photos/images; rulers.

Additional Notes

Consider including High quality maps—satellite, topographic, etc. May be projected on large screen; be sure to include scale with photos; always ask some questions about causes and predictions.

Additional guidance and resources for Event Supervisors may be found on the Event Pages for Division B and Division C at soinc.org.

Elastic Launched Gliders (B)

Impound: No

Room Type: Gym, cafeteria, high "clean" ceiling, if possible, with no rafters

Estimated Prep Time (including set-up): 2-4 hours

Helpers: 3-5

Event Conflicts: None

Minimum Suggested Supplies

Balance-gram to 0.01g, stop watches, metric rulers-1 meter, 30 cm, timer; gauges to measure the specific dimensions, pieces of poster board with marks for each size limit, table. Consider using a door monitor to minimize disruptions and air currents during flights.

Additional Notes

Try to keep HVAC off; no entry or exit during flight. Consider having a long, expandable pole to get planes if they get stuck on rafters; separate area for spectators. If possible, work with the tournament director to provide room dimensions and type of room prior to the tournament to all teams.

Experimental Design (B & C)

Impound: No

Room Type: 1-2 labs with tables are ideal but can also be run in classrooms if no chemicals are used.

Estimated Prep Time (including set-up): 10-20 hours

Helpers: 2-4

Event Conflicts: Write It, Do It

Minimum Suggested Supplies

Many equal set ups, materials/problems can be anything; at minimum, each station may need rulers or timers or beakers. Copies of the report packet for each team.

Additional Notes

Long set up with one station per team; Long time to grade; should be scheduled as early event; be sure that each station has identical materials; problem can be anything, but try to give students some ideas such as "process X is influenced by 3 different factors a, b, c. Devise an experiment that shows effect of one of these. Vague instructions of the form "design and do an experiment" (with nothing else) should not be used.

Requires good scoring rubric; strongly consider using scoring rubric on soinc.org. Graders should read pages describing scoring rubric. Have a grader meeting to discuss criteria prior to beginning grading of the reports and establish that there is more than one way to conduct an experiment. Use of appropriate units for many categories is essential. If multiple people are grading, consider having them only focus on one part of the report for all teams as opposed to grading the entire report for a few teams. This will promote more consistent and reliable grading.

Fermi Questions (C)

Impound: No

Room Type: Any room will work; however, a room with tables is ideal

Estimated Prep Time (including set-up): 8-10 hours

Helpers: 1 - 3

Event Conflicts: None

Minimum Suggested Supplies

Test questions, scoresheets and scrap paper for each team and one timer

Additional Notes

One possible distribution of people for this event is that the Event supervisor will direct the event, one person will serve as a timer and will help collect the tests and scoresheets and the last helper will be the scorer and score answer sheets while the next round is being conducted.

Forensics (C)

Impound: No

Room Type: Chemistry lab with gas connections in the hoods

Estimated Prep Time (including set-up): 10-15 hours

Helpers: 2-4

Event Conflicts: Chem Lab, Material Science

Minimum Suggested Supplies

Appropriate chem lab supplies: thermometers, cylinders, balances, reagents, usually at each station; chromatography supplies, pens; shoe prints, Iodine reagent (Iodine dissolved in KI solution), 2M HCl, 2M NaOH, Benedict's solution, (no more than 50 mL of each of the solutions) a hot water bath, a Bunsen burner or equivalent BTU heat source to perform flame tests, a waste container, microscope, chromatography materials, unknowns, and a wash bottle with distilled water (no more than 250 mL). Hair, fabric and candles, plastics and density determining supplies.

Additional Notes

Long prep; need many sets of reagents; better done with same setup for each station and team; consider using many different pens with black ink rather than different colored pens; consider a scenario in which any or none could be the prep; same size shoe prints but worn differently creates a different scenario. Test template, recipes for reagents, and other helpful hints available. Be sure students come with proper safety equipment. Be sure the event supervisors and helpers have proper safety equipment.

For all Chem Events see Supervisor Tips on www.soinc.org.

Fossils (B & C)

Impound: No

Room Type: Lab or large classroom with flat tables

Estimated Prep Time (including set-up): 10-15 hours

Helpers: 1-2

Event Conflicts: None

Minimum Suggested Supplies

Many different kinds of fossils, actual specimens better than pictures

Additional Notes

Stations with actual specimens; actual specimens are better than images; local mineral society or museums are often good sources of help.

Event Supervisors are advised to **NOT** use the Genus *Carcharodon* for identification on **ANY** Science Olympiad Fossils exam; it was included on the Fossils List as an alternative genus for the species C. *Megalodon*. Both genera should be accepted for *C. Megalodon.* It would be considered an inappropriate question to have a station that includes a Great White tooth and a megalodon tooth, and ask to identify each. A more appropriate question would be to ask the participants the rationale for the change of *C.* M*egalodon* to the genus *Charcharocles*.

Event Supervisors should also make allowances for participant responses concerning #20, the Genus *Eldredgeops* and accept either *Eldredgeops* or *Phacops* as valid. While *Eldredgeops* is the preferred, and scientifically correct name for the genus, the former name *Phacops* is still in common use and may be found in many references and should be accepted where appropriate.

Game On (B)

Impound: No

Room Type: Computer room

Estimated Prep Time (including set-up): 10-15 hours

Helpers: 2-3

Event Conflicts: None

Minimum Suggested Supplies

Computers with the Scratch program (Available for download from http://scratch.mit.edu) to create an original computer game based on the assigned theme. Projector and screen to display time remaining and instructions to competitors.

Additional Notes

Tournaments are encouraged to provide computer specifications and which Scratch version they will be running to the teams as early as possible. A broad theme to build their original computer game around.

Work with your tournament director to coordinate with the tournament site's IT department. They can be a huge help in getting things set-up for you.

The Scoring Rubric for this event and additional guidance and resources for Event Supervisors may be found on the Event Page at soinc.org.

GeoLogic Mapping (C)

Impound: No

Room Type: Typical classroom, ideally with flat tables & projection equipment (i.e.; LCD projector, screen)

Estimated Prep Time (including set-up): 10 – 15 hours

Helpers: 1 - 2

Event Conflicts: None

Minimum Suggested Supplies

Test, Answer Sheet, & Key; Rulers and Protractors; High quality images (if at all possible avoid photocopying)

Additional Notes

If providing maps to students, be sure they are HIGH quality and resolution; if projecting things, allow ample time; be sure scale is included.

Additional guidance and resources for Event Supervisors may be found on the Event Page at soinc.org.

Heredity (B)

Impound: No

Room Type: Any science lab or classroom with flat tables

Estimated Prep Time (including set-up): 15 – 20 hours

Helpers: 2 - 4

Event Conflicts: None

Minimum Suggested Supplies

Additional Notes

Minimum Suggested Supplies

Test, Answer Sheet, & Key; Timer(s)/Stopwatch(es); Materials for Stations (i.e.; Microscopes, slides, pictures, karyotypes, diagrams, pedigrees, specimens such as corn ears, beans, plants, etc and laboratory data/genetic test results)

Additional Notes

This event is best run as stations; either 10-12 at 4 minutes/station, or 15 at 3min/station. Questions should be designed to challenge student understanding of basic concepts of genetics such as mono- and di-hybrid crosses, pedigrees, karyotyping, structure and function of DNA, and chromosomal abnormalities. Questions focused on the application of this knowledge to problem solving are preferred. Be sure to include both forward thinking (genotype to ratio of progeny) and backward thinking (phenotype and numbers to probable genotypes. For karyotypes, be sure to use either all diploid or all haploid images. In the more challenging questions, students will solve problems/identify reasons for genetic malformations/find transmission patterns of hereditary diseases/identify abnormal genetics at each station. Avoid having participants create pedigrees as they take a long time to create and scoring can be problematic.

Additional guidance and resources for Event Supervisors may be found on the Event Page at soinc.org.

Herpetology (B & C)

Impound: No

Room Type: Biology lab or large room with flat tables

Estimated Prep Time (including set-up): 10-15 hours

Helpers: 2-3

Event Conflicts: Dynamic Planet, Ecology

Minimum Suggested Supplies

Pictures or actual specimens; may be done as PowerPoint.

Additional Notes

Better run as stations with pictures or specimens if allowed in your state; classroom will need large projection screen; when using pictures, be sure to include scale for size; be certain to include some questions on economic importance, natural history, behavior, and ecology. Specimens should be used if at all possible. Area nature facilities are often good sources of critters.

Meteorology (B)

Impound: No

Room Type: A large room with enough space, such as a large classroom with tables, for teams to work comfortably is ideal for the Meteorology event for either the Stationary Workstation or the Timed Station formats. A larger room will allow adequate spacing of teams from one another, minimize distractions from other teams and provide ease of movement.

For the Stationary Workstation format, larger tables will provide adequate room for teams to spread out maps and images.

For a Timed Station format, longer laboratory tables would be ideal as they encourage an ordered and systemized movement of teams from station to station. Be sure that the floor plan is free of obstructions that would hinder or confuse the movement of teams from one station to the next.

Estimated Prep Time (including set-up): 10-15 hours

Helpers: 1-3

For a Stationary Workstation format, one or two volunteers would be helpful in setting up the event, checking-in and checking-out teams as well as for scoring events and event take-down.

For a Timed Station format, at least two or three volunteers would be needed to time stations and rotate students as well as for the activities mentioned above.

Event Conflicts: Dynamic Planet

Minimum Suggested Supplies

Enough copies of exam for each team; Actual weather maps from NOAA, charts

Whether you are using a Stationary Workstation or a Timed Station format, it is imperative that you standardize the resources that you provide. All resources that you provide MUST be the EXACT same as those provided to every other team in every session of your competition. This even applies to such minute things as the kinds of ruler you provide, the amount of string, the amount of time teams have to answer questions and even the kind of pencils each team uses. Standardization of event resources and conditions prevents accusations that some teams had 'better' resources for competition than others did.

For the Meteorology competition, you will likely use Images or sets of Images. If you are using 8.5x11" images, place each into its own sheet protector to minimize damage that may be caused by team handling of the images during competition. You can also laminate images of any size.

You should also provide rulers and protractors for teams to take measurements. Scrap paper for calculations or notes and pencils are also important items.

If you are using PowerPoint, or any other media to display images, be sure to have a computer and LCD projector available. It is also advisable to have a contact for any technology or laboratory issues that you may encounter prior to and during competition.

Additional Notes

Actual weather maps from NOAA, charts, etc. online are ideal; some images can be projected. Try to avoid creating a test that only has multiple-choice questions. Include questions that require some calculations or analysis where possible. Local TV weather people may be able to help, offer suggestions or provide images. Contact these folks many weeks in advance.

Additional guidance and resources for Event Supervisors may be found on the Event Page at soinc.org.

Meteorology may be run in one of the following formats:

Stationary Workstation

Teams are provided with all of the images, maps and other resources needed to complete the event at individual workstations for each team. Teams do not move from station to station and have the entire period of competition to complete the activities. You will need to provide enough materials for each workstation to accommodate the number of teams competing per session.

Advantages:

- Teams have flexibility in determining how much time they will devote to answering certain questions.
- You can ask more detailed, higher level questions or provide extended problem-solving activities.
- Less volunteers are needed to run the event

Disadvantages:

- You will need to provide multiple sets of materials for each workstation, which can be more expensive than using a single resource in a timed station format.

Timed Stations

Teams move from station to station answering one or more questions using a set of resources provided at each station. The amount of time to answer each question or set of questions is limited, and you must include enough time for all teams to visit every station. You will need to provide enough stations to accommodate the number of teams competing in each session. You will also need stopwatches and extra volunteers to help run the event.

Advantages:

- Event setup may be less expensive as all teams use a common resource provided at a single station.
- Moving from station to station provides teams with a variance of activity as they are not seated in one place for the entire period of competition.

Disadvantages:

- Teams have less flexibility in determining how much time they will devote to answering certain questions.
- It is more difficult to ask higher-level thinking questions or provide extended problem-solving activities in a timed station format.
- You will need more volunteers to help run the event.
- It is important to clearly communicate directions for moving from station to station, checkout and other event procedures to teams.

The format that is chosen should ultimately be based on your preferences, and any prior experience you have in running Science Olympiad events. You will also want to consider the Event Needs discussed in the previous sections including room type, the number of volunteers available to help you run the event, availability and cost of Meteorology images, maps, stereoscopes, LCD projectors and other equipment. You will also need to check the Tournament Schedule to ensure that you will have enough time to set up/take down your event should other events be scheduled at your location.

Mission Possible (C)

Impound: Only at State & Nationals

Room Type: Large room with many flat tables. Multiple tables for set up and testing of devices as well as Sign up

Estimated Prep Time (including set-up): 2-4 hours

Helpers: 6 - 8

Event Conflicts: None

Minimum Suggested Supplies

Timers, Stopwatches, Clipboards, Protective eye wear for judges, metric tape measure

Additional Notes

Impound for State & Nationals. Consider a sign-up schedule. Teams may come 30 minutes before test time to set up. Note: steps do not have to be in order, only specific start and end tasks per rules.

It is recommended that each scorer either should be looking for different transfers with an additional person timing or have each scorer responsible for each side of the device to watch for transfers and have an additional person be the timer.

Mousetrap Vehicle (C)

Impound: Yes

Room Type: Wide, flat hallway or gym; area for impound at all tournaments

Estimated Prep Time (including set-up): 2-4 hours

Helpers: 2-4

Event Conflicts: None

Minimum Suggested Supplies

Photogate timing system if possible; if not using a photogate system, have 2 lasers set up at the timing lines for ease of the timers to see when the dowel passes the timing lines; tape to mark course; measuring tapes; stop watches; Several 16-oz. identical plastic cups

Additional Notes

This event is best run in a big space where the impound area and participants can be kept separated from spectators. Rope, or some other queuing device, should be used to designate where spectators are allowed off the area to keep spectators away. If you have a large number of teams competing consider setting up additional but identical courses. Do not tell target distance until all devices impounded.

To be successful a smooth surface is paramount. Avoid tile floors with seams. Notify teams ahead of the tournament, via email or a tournament website, the type of surface (e.g., vinyl, wood, concrete) that will be used. Also, emphasize with coaches in ample time before the competition that manufacturer voltage must be clearly marked. Do not tell target distance until all devices impounded.

Mystery Architecture (B)

Impound: No

Room Type: Large room with limited windows and tables/floor space for each team

Estimated Prep Time (including set-up): 6 – 10 hours

Helpers: 5-8 to allow for fast testing of the structures at the end of the session.

Event Conflicts: Experimental Design and Write It, Do It

Minimum Suggested Supplies

Various low-cost building materials in bags for each team. Each bag should contain the same type of materials in the same amounts for the given problem (e.g., bridge, tower, a cantilever for State and National tournaments).

Additional Notes

This event will require a lot of materials as each team will need the same material set-up. Please plan accordingly to have time to acquire the needed materials and prepare individual team kits. It is recommended that low-cost materials (i.e., craft sticks, pipe cleaners, straws, masking tape) be used. In order to maintain the mystery of the event, try to use a room without windows. If windows are present they should be covered.

Also make sure you allow for time to measure and test all the structures that are built during your session.

Additional guidance and resources for Event Supervisors may be found on the Event Page at soinc.org.

Potions & Poisons (B)

Impound: No

Room Type: Chemistry Lab

Estimated Prep Time (including set-up): 10-20 hours

Helpers: 2-4

Event Conflicts: Crime Busters

Minimum Suggested Supplies

At least one hands on activity required. Appropriate chem. lab supplies: a waste container, thermometers, balances, reagents, as appropriate, pictures of the current year's toxic organisms, Distilled or ROI water for each team in wash bottle, unknowns.

Additional Notes

Long prep time; may need many sets of reagents; May be done with same setup for each station and team or as stations. Be sure students come with proper safety equipment. Be sure the event supervisors and helpers have proper safety equipment.

For all Chem Events see Supervisor tips on www.soinc.org.

Protein Modeling (C)

Impound: Yes

Room Type: A computer lab with open table space to store models and allow on-site construction

Estimated Prep Time (including set-up): 10-15 hours;

Helpers: 2 - 4

Event Conflicts: None

Minimum Suggested Supplies

Test, Answer Sheets, & Key (provided by Milwaukee School of Engineering (MSOE) for Regional and State Tournaments); rulers and other measuring devices to evaluate models; on-site protein building materials from MSOE (for Regional & State Tournaments) or common items (e.g.; Kwik Twists, 12-gauge dimensional house wire, Mini-Toobers®, amino acid sidechains, crosslinkers, plastic red & blue end caps, etc.)

Additional Notes

Make sure to review all materials from MSOE before the tournament. Also work with the Tournament Director to discuss event needs and use of computers with the host site's IT department. Try building both the pre-built and on-site proteins in advance of the tournament so you can have practice using both rubrics. Consider having one individual grade only one type of model to insure consistency of the rubric across all teams.

Additional guidance and resources for Event Supervisors may be found on the MSOE Protein Modeling Event page as well as on the Event Page for Division C at soinc.org.

Road Scholar (B)

Impound: No

Room Type: Large classroom with flat tables

Estimated Prep Time (including set-up): 10-15 hours for experienced people, 20-30 for novices

Helpers: 1-2

Event Conflicts: None

Minimum Suggested Supplies

Identical highway and topo map for all teams; topo symbol chart; identical questions for all teams; LARGE FLAT TABLES ARE ESSENTIAL

Additional Notes

Consider laminating topo symbol charts; make sure all have same maps; try to ask a variety of different kinds of questions; do not photo copy the topo (obtain from USGS). May consider laminating topo and road maps also.

Roller Coaster (B)

Impound: Yes

Room Type: Gym or large room with floor space, may be carpeted; Impound at all tournaments

Estimated Prep Time (including set-up): 2-3 hours

Helpers: 3-5

Event Conflicts: None

Minimum Suggested Supplies

Several #2 unsharpened pencils with an unused eraser; Timers, Stopwatches, Clipboards, Protective eye wear for judges, metric tape measure.

Additional Notes

Impound for all tournaments; Consider a sign-up schedule; Note: During the team's 8 minutes, they may do as many practice runs before and between their scorable runs; but, they must start their official run before 8 minutes expire.

Solar System (B)

Impound: No

Room Type: A classroom with desks or tables

Estimated Prep Time (including set-up): 6 - 10 hours

Helpers: 1-2

Event Conflicts: None

Minimum Suggested Supplies

Large classroom with projection capabilities. PowerPoint will often suffice

Additional Notes

Equal time for each projection, etc.; probably best to run all teams at same time. May use sections of maps

Sounds of Music (C)

Impound: No

Room Type: One large room for the written test, two, or more, adjacent rooms for instrument testing

Estimated Prep Time (including set-up): 10-15 hours

Helpers: 4 - 6

Event Conflicts: None

Minimum Suggested Supplies

Test, Answer Sheet, & Key; Pitch pipe or electronic equipment for determining pitch, possibly oscilloscope; stopwatches to time the sessions; clipboards; music stands.

Additional Notes

Be careful with the timing of this event, you will need to complete the written test and the instrument in the allotted session time. Have participants come up to test their instrument while the written test is being taken.

While there are several different resources that can be used to determine pitch ,a few that have been identified that merit Event Supervisor consideration are:

- **Accord Chromatic Tuner** – for Android phones
  https://play.google.com/store/apps/details?id=uk.co.avoir.gaccord&hl=en_US
- **Science Journal by Google** – for Android and Apple phones
  https://play.google.com/store/apps/details?id=com.google.android.apps.forscience.whistlepunk&hl=en_US
  https://itunes.apple.com/us/app/science-journal-by-google/id1251205555?mt=8

While there are several different resources that can be used to determine volume, a few that have been identified that merit Event Supervisor consideration are:

- **Decibel X** – for Android and Apple phones. It is recommended that event supervisors purchase the Pro Version for $4 as it comes with some additional features.
  https://play.google.com/store/apps/details?id=com.skypaw.decibel&hl=en_US
  https://itunes.apple.com/us/app/decibel-x-db-dba-noise-meter/id448155923?mt=8
- **Science Journal by Google** – for Android and Apple phones
  https://play.google.com/store/apps/details?id=com.google.android.apps.forscience.whistlepunk&hl=en_US
  https://itunes.apple.com/us/app/science-journal-by-google/id1251205555?mt=8

Additional guidance and resources for Event Supervisors, including a forthcoming dedicated Event Supervisors Guide, may be found on the Event Page for Division C at soinc.org.

Thermodynamics (B & C)

Impound: Yes

Room Type: Large Lab with access to water and electricity. Also, space will be needed for Impound.

Estimated Prep Time (including set-up): 10-15 hours

Helpers: Impound 1; Event 2 -4

Event Conflicts: None

Minimum Suggested Supplies

Impound items: measuring stick or size gauge, hole size gauge, check sheet

Part I - Device test items: Temperature probe, insulated hot water container 1+ gallon, water heater, measured water dispensing (Possibly large plastic syringes), towels, 2 stop watches, ice cubes, and water.

Part 2 - Written test

Additional Notes

Event: Teams prepare device, hot water is added to the device by the supervisor, teams close the device, supervisor measures the temperature of the device after predetermined time. Teams take a written test the after device is setup. Precise timing is required for 20 to 30 devices in parallel.

Water Quality (B &C)

Impound: None

Room Type: A science lab with access to water and electricity

Estimated Prep Time (including set-up): 10 -15 hours

Helpers: 1 - 5

Event Conflicts: None

Minimum Suggested Supplies

Test, Answer Sheet, & Key; Salt; 400 to 600 mL beakers, Microscopes (if using live specimens); Images or models of Macroinvertebrates

Additional Notes

This event is ideally run as a series of stations. When selecting questions consider including graphs and tables, food webs, ecological pyramids, life cycles, sampling and population density, and data from ecological studies. Try to have questions focus on process skills and use strictly vocabulary questions sparingly.

Set up the hydrometer station near a sink and have plenty of paper towels available. One volunteer should be stationed at the hydrometer station. Any station instructions/additional questions at the hydrometer station need to be setup so that they don't get wet and destroyed. However, at the Regional level, participants may need to focus on testing their hydrometer, so additional questions at this station are not recommended. When doing idenifications, try to avoid using pictures of specimens/macroinvertebrates. Nature areas are great sources of specimens/macroinvertebrates.

If using higher concentrations of salt solution, make sure to allow enough time that the salt dissolves completely.

Additional guidance and resources for Event Supervisors may be found on the Event Pages for Division B and Division C at soinc.org.

Wright Stuff (C)

Impound: No

Room Type: Gym, cafeteria, high "clean" ceiling, if possible, with no rafters

Estimated Prep Time (including set-up): 2-4 hours

Helpers: 3-5

Event Conflicts: None

Minimum Suggested Supplies

Balance-gram to 0.01g, stop watches, metric rulers-1 meter, 30 cm, timer; gauges to measure the specific dimensions

Additional Notes

Try to keep HVAC off; no entry or exit during flight. Consider having long expandable pole to get planes if stuck on rafters; separate area for spectators; if possible, work with the tournament director to provide room dimensions and type of room prior to the tournament to all teams.

Write It Do It (B & C)

Impound: No

Room Type: 2 adjacent large rooms with flat tables

Estimated Prep Time (including set-up): 12-20 hours

Helpers: 2-4

Event Conflicts: Experimental Design

Minimum Suggested Supplies

Various identical supply bags: corks, beads, paper clips, index cards, stickers, toys (Lincoln Logs, Legos, K'Nex, blocks, etc.) In addition, coffee stirrers and coffee sleeves and different colored plastic eating utensils are good things to use. Use your imagination.

Additional Notes

Will need at least 1 model for every 4-5 teams. Make sure supply bags are uniform. Setting up bags and building structures requires much time; No spectators. Glass doors and windows to hallways should be covered. Develop good rubric for scoring.; 25-30 pieces should usually be maximum; do not make object too complicated for completion; experiment with different structures; office and craft stores are good source of supplies; long time to score so schedule early. With 25-30 pieces one can create 75 + points since many pieces will have orientation and attachment to evaluate.

Many people develop a scoring rubric with long phrases. Consider developing a rubric similar in form to what is used for Experimental Design. If one is talented with use of camera and cropping pictures, one can create a scoring rubric that show a few views of the object. At each junction, imbed a small box that can be used to check if connection, orientation, etc. is good. Done properly, one person can score 30 structures in an hour.

Be sure to record finish time of teams, since this is tie breaker criterion. Any creative person can be used to supervise this event. English and art people are often good for this event.

Appendix A

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.

Appendix B

2019 Science Olympiad Calculator Guide

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.**

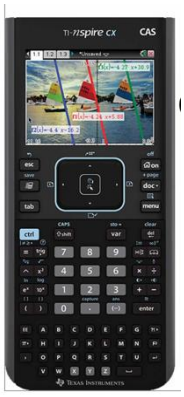
Stand-alone non-graphing, non-programmable, non-scientific 4-function or 5-function calculators can be used in the following events: Anatomy & Physiology, Astronomy, Battery Buggy, Circuit Lab, Chemistry Lab, Codebusters, Designer Genes, Density Lab, Disease Detectives, Dynamic Planet, Elastic Launched Gliders, Experimental Design (Both Divisions), Forensics, Geologic Mapping, Heredity, Meteorology, Mousetrap Vehicle, Potions & Poisons, Road Scholar, Sounds of Music, Thermodynamics, Wright Stuff, and Water Quality.

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.

Stand-alone non-programmable, non-graphing calculators, in addition to the above listed calculators, can be used in the following events: Anatomy & Physiology, Chemistry Lab, Dynamic Planet, Designer Genes, Disease Detectives, Experimental Design (Division B.), Forensics, Geologic Mapping, Heredity, Meteorology, Potions & Poisons, Road Scholar, and Water Quality.

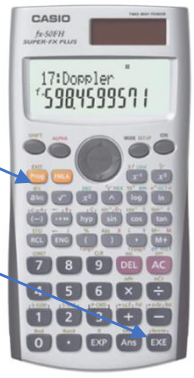
Stand-alone non-programmable, non-graphing calculators look like the calculator to the right or simpler. There are hundreds of calculators in this category but some common examples include: CASIO FX-260, Sharp EL-501, and TI-30X.

Stand-alone, programmable, graphing calculators and **stand-alone non-graphing, programmable calculators,** in addition to the above listed calculators, can be used in the following events: Astronomy, Battery Buggy, Circuit Lab, Density Lab, Elastic Launched Gliders, Experimental Design (Division C), Mousetrap Vehicle, Sounds of Music, Thermodynamics, and Wright Stuff



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

Stand-alone non-graphing, programmable calculators are another type of calculator that can be used in the above listed events. To identify these calculators, 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.



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

Appendix C

Eye Protection Guide

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