Science Olympiad

Updated 2024

Head Coaches' Guide

Divisions B and C

Region 7

Macomb and St. Clair Counties

Head Coaches' Guide
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FOREWORD

Welcome to the world of Science Olympiad in Macomb County. This Head Coaches Handbook is intended to help not only the brand new coach, but seasoned ones as well. Our purpose is to simplify the process of starting a team and successfully competing at any level.

Our vision is to update this annually – making it a robust resource. Please take a few minutes to provide your feedback on any revisions, additions, or clarifications to the following email address: ssodirector@macombso.org . We value your input in promoting the success of all our teams.

Since its inception, Science Olympiad has led a revolution in science education. Thank you, Head Coaches, for your efforts in making a difference for our future scientists and engineers!

Yours in Science,

The Macomb County Secondary Board

"The most incomprehensible thing about our universe is that it can be comprehended"
Albert Einstein

SECTION A: OVERVIEW OF SCIENCE OLYMPIAD

A Brief History of Macomb Science Olympiad

There is no secret to the fact that the *Science Olympiad* program has been a tremendous success in creating a nation-wide opportunity for students of science, engineering, and math to challenge themselves in an atmosphere of competition and excitement. It all began in 1984 in Macomb County, based upon the insight of forward-thinking educators who believed that excellence in science education could be advanced in elementary, middle, and high schools through the use of extra-curricular tournaments designed to create competition in a wide range of events. These competitions would provide exciting and fun challenges in scientific literacy and technological leadership. The *Science Olympiad* tradition continues because of the individual contribution of so many people from our community at so many levels and in so many ways; that to give it a good, accurate description would be difficult. Borrowing from a concept familiar to science, it seems appropriate to say that the gravity of *Science Olympiad* lies in the center of each team where the students come together with a coach that guides them to competition.

Science Olympiad Regional Organizational Structure

The organizational structure of *Macomb Science Olympiad* is pretty straight-forward. It is a Michigan based, non-profit corporation with a Section 503(c)(3) designation under the Internal Revenue Code based on its non-profit educational mission. It has an executive board of directors and corporate officers who are elected each year. Two standing committees are assigned the task of planning and conducting the annual tournaments: The Elementary Tournament Committee for elementary teams (through grade 5 or 6) , and the Secondary Tournament Committee for middle school teams and high school teams ((grades 6-12). The committees are always on the look-out for new members.

Budgets are established at the beginning of each year for each tournament committee, and with the special help of a fund-raising committee and the generous contributions of businesses in the community, the organization funds the budgetary needs while keeping team registration fees at a modest level. No school or team should ever decide not to participate because of money concerns.

Science Olympiad at the State and National Level

At the state level, *Science Olympiad* operates through a separate non-profit corporation which conducts a state-wide tournament, inviting a predetermined number of winning teams from each region to compete in the spring on the campus of Michigan State University. Then, the top two teams at the state level are invited to compete in the *National Science Olympiad* late in the spring in an event conducted by *Science Olympiad, Inc.,* against top teams from across the country.

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The Regional Tournament in Early Spring

In our Region #7, the territory includes both Macomb and St. Clair counties (sometimes teams from Wayne County also join the tournament). Typically, the Regional Tournament, includes about 20 schools in Division B and 10 schools in Division C. Usually, the Regional Tournament is held at Macomb County Community College, South Campus in Warren.

The Regional Tournament will consist of 46 competitive events pre-determined at either the National or Regional level. Generally speaking, in Division B, middle school teams consist of students from ranging from 6th to 9th grade. The high school teams in Division C include students at the 9th to 12th grade level. There is some overlap as some middle school teams may include 9th graders. Each division has 23 events and may also include some trial events. After the events are completed, the teams gather in the Sports Expo Center and await the scoring of events and the resolution of any disputed results. The top finishing students receive medals in their individual events, and the top finishing teams receive trophies. During the award ceremony, the pavilion is filled with the admiring friends and families of the students, and the bleachers literally rumble with all of the cheer and excitement. The top team winners in these divisions advance to a state-wide tournament competition in the spring hosted by Michigan State University.

Rules Governing Team Formation

Team formation is governed by *Science Olympiad* rules which are contained in the manuals published each year for each division. Advance registration is required, and early in the fall of each year we send reminders to area schools. The deadline for final registration is about 30 days before the Regional tournament. The team may consist of up to fifteen (15) students from the registered school, with a maximum of five (5) ninth graders on Division B teams and seven (7) twelfth graders on Division C teams. There are some rules regarding the fielding of multiple teams per school, the use of alternates, and the final registration or assignment of students to particular events, so read the manual carefully.

Rules Governing the Events

Well in advance of the tournament, the competitive events are selected from an array of events promoted by *Science Olympiad* and are designed to follow requirements and standards described in the published manual. ***It is very important to get the manuals and develop a habit of having the rules and event descriptions at your disposal for ready reference in getting the students started and guiding them through the regulations that if not understood could lead to unfortunate disqualification at the tournaments.***

Preparation for Tournament Events

Each coach should review the description of the events scheduled for competition, bearing in mind that these events will be tackled by students who may have had no prior introduction to the

subject matter. Frankly, the task of understanding the details of each event description can be daunting even for someone who has prior experience. Plus, subtle changes in the rules can throw you. Consequently, the Macomb Science Olympiad strives to promote an understanding of the event details through a number of methods:

- Coaches meetings - for head coaches and beginning coaches.
- On-line information feeds at our website where supervisors of each event can field and address questions concerning an event.
- Workshops where demonstrations are given by coaches, supervisors, or outside experts that have "been there and done it", and students can bring their build devices to get hands-on help to make improvements.
- Event Extravaganzas to showcase a wide assortment of events with supervisors presenting tips and ideas for coaches and students to prepare for tournaments.

These events will be scheduled throughout the school season to provide a base of support for every coach and to maximize an early understanding of each event's requirements.

Some of the tournament events are very technical or require considerable study and memorization. Other events involve a commitment to the building of machines or structures which involves a time commitment that matches any of the so-called "study and memorization events." As coach, you will need to assign students to compete in each event, with some students studying multiple events. You will make those decisions based on student interest and experience. Each year, the panoply of events is intended to provide a range of potential areas of interest for all students. The events planned this year are described on the National Science Olympiad website: https://soinc.org/events/2025-event-table

Prepare the Team through Invitational Participation

Across the State of Michigan, many *Science Olympiad* regions conduct **Invitational Tournaments** that are organized for real competition but which don't effect a team's standing within a region or the state. In planning for your team, early on consider this method for shaping your team and gauging student progress. An invitational tournament provides a great opportunity for individual students to test themselves in an atmosphere with less pressure and creates a team outing which builds team spirit. An added benefit is that the volunteer participation of parents opens the door for the coach to get additional help and support for the team as the Regional tournament draws near.

SECTION B: TEAM FORMATION AND HEAD COACH RESPONSIBILITIES

Team Formation

Initial Invitation for Students – Packet of Information
Students are back to school forming routines and finding new friends. Mid to late September is a good time to create interest and invite students to a brief meeting after school. Introduce yourself as head coach and stress the commitment and time expectations. Distribute the information packets to students and their parents. Forms should be turned in to the school office within 10 days for those students who are serious about participating (see appendix: **INITIAL PACKET**). Include contact information, parent and student, student availability matrix, and event ranking. The submitted forms will give a good indication of how many students are trying out. If there are 25 or more, you may want to consider registering alternate teams along with your primary team.

Students Event Assignments
Within the **INITIAL PACKET**, students are asked to rank the events from 1-10 (1 being most desired, 10 being last on their list). Place 3-4 students in each event based on their rankings provided. Students who participated last year should be placed into the same events, or similar events where possible and it makes the most sense. Pair older students with younger students to set up your team for the following year in repeat events. If new students participated in elementary Science Olympiad, place them in related events.

Event Coaching Assignments – Parents, Grandparents, Teachers, Past Students, Other Teams in your School District, Business and Industry
The most difficult part of forming a successful Science Olympiad team
(besides hours of practicing) is delegating event coaching responsibilities.
It has been shown that students who have parents coach them do very well in the competitions, so the first request should be to the parents of students participating. The first parent/student team meeting is a good place to fill these coaching positions. Past coaches and teachers should be asked where needed. Teams within the same school district may consider sharing coaching/material resources. The official Science Olympiad rule book is free to download upon registration. This is necessary for coaches and students to proceed with practices.

Event Coaching Tips and Expectations
New event coaches generally need extra attention. Communicate to all event coaches what is expected of them regarding practices, meeting frequency, and time commitments required for their event(s). Provide tournament dates, schedules, and all pertinent information such as resources for coaching, rule clarifications, etc. As a general rule, they should meet with the students at least once per week and meetings should accommodate as many students as possible based on their availability (student availability matrix). Meetings should start by the middle of October. Head coaches may need to contact new coaches on a regular basis to answer questions and/or make suggestions such as lessons, practice tests, and meeting format.

Optional Trial Period 6 to 8 weeks
Consider making the first 6 to 8 weeks of the season a "trial" period. Even if there are only 15 students, it may be a good idea to have tryouts for individual events and/or the team. Coaches can plan to evaluate the students in their event(s) and after 6 to 8 weeks of meetings, recommend to the head coach the top 2 students best to participate in the event. Evaluations can be based on Participation, Aptitude/Ability, and Teamwork/Attitude (see sheet 1 of Initial packet).

Team announcement/ Alternates
The last week before winter break in December, announce final decisions regarding team rosters, ie. Primary vs Alternate teams. The schedule for Regionals and State tournaments should be available and students placed into the events in which they will compete. Your team rosters may change due to student availability, scheduling conflicts, etc. Alternatively, you may decide to wait until after invitationals to make final decisions regarding a primary and alternate team.

Invitational Tournaments
Invitational Tournaments are highly recommended, especially for schools with several alternates or enough students for 2 teams. Invitationals accomplish 2 main objectives: one is to prepare the team for Regionals by improving the overall performance of the team(s) and two, enable the alternate team members to participate in tournament(s). All students may not be able to attend, but these are practice tournaments. Make every attempt to cover all 23 events at these invitationals. Remember non-participation in an event will result in a penalty. Individual medals are awarded here as well as trophies for top teams. Invitationals are similar in format to the Regional tournament and will be a great experience for students and coaches to fully understand how their events are run, and more broadly, what they can expect at Regionals.

Invitational, Regional, State, and National Tournaments
One week prior to each tournament, have a team meeting to distribute schedules, maps, meeting locations, food options, and expectations for the day. Go over any notes to parents and students during this meeting. Head Coaches can provide an Equipment List for each event – a checklist for what to bring to your event. You may want to ask parents to sign up to bring snacks for the team. Be sure students bring activities to keep them occupied during their down time between events.

Suggested Timeline:

- September: Team registration for Regional and State Science Olympiad
- October: Head Coaches Meeting
- September – October: Initial team formation, register for invitationals
- October: Permission slips for student participation, distribute draft calendar
- October thru December: Coaching assignments and trial period
- December: Michigan State Coaches Clinic
- December: Macomb Regional Coaches Extravaganza
- December, January, and February: Coaches meetings, event workshops
- January: Initiate T-shirt design and ordering
- January - February: Invitationals registration and scheduling
- March: Regionals scheduling – Self-scheduling
- March: Regional Tournament lead up to final schedule/team meeting
- March: Regional Tournament
- March: State permission slip
- March: Regionals Tournament debriefing
- March: State Tournament- Finalize lodging/transportation
- April: State scheduling – Self-scheduling online

Head Coach Responsibilities:

- Periodic student/parent meetings
- Any student permission slips or waivers as required by school administration
- Managing team budget
- Delegating responsibilities/tasks to parents as needed
- Periodic pizza parties and team activities
- Team picture(s)
- School announcements, school newsletter articles and community newspapers
- Organize field trips
- Fundraising activities for team
- Ongoing recruitment of future students and coaches
- May-June: Honors Night student recognition – Medals and Certificates
- End of Year Party
- School administration and School Board Recognition

SECTION C: PRACTICE & TOURNAMENT STRATEGIES

Event Rules

Every event coach should be given the SO sponsored rules for their event upon their first team meeting. Make certain that you READ AND UNDERSTAND the event rules. This means a careful and thorough scrutiny of the event rules write-up. This may seem overly simple but can't be overstated. The event write-ups are, in general, well written, clear and concise. After reading these rules, an event coach should meet with his/her team and spend whatever time is required to make sure the team members have a clear understanding of these rules as well. Once you have reached this point, you should have a final discussion where the team can establish questions to further clarify the event. And remember to check the regional (Macombso.org) and state (MiSciOly.org) websites regularly. Many questions/answers about the event may get posted, keeping you up to date with your event. Talk to any experienced event supervisor, they can attest to how many coaches and teams show up for their event without a clear understanding of the event rules. Make sure your event coaches and students come to practice with a clear understanding of the event rules and all materials required for their events.

Practice Meetings

Be sure to reserve space for your team meetings. Most will take place at school after hours, in a classroom, in the library, or even in the cafeteria. You will need to arrange this with the school's administration well in advance of your first meeting. Some build events are better suited for meeting at a team member's house where there is easy access to materials and tools. Each event coach now has to establish a regular meeting time for the event team members. This will be challenging because of the commitments that all the students have for other commitments but establish the schedule. A coach will quickly see which students are most committed to the event by their presence at these established meeting times. The event coach should gather telephone numbers and emails for each of their team members at this point and share this information with the event team. Attendance at these meetings may be used as one of the determining factors for tournament readiness, and "final team" or "alternate" designation.

Written Test Events

Upon perusal of event rules, the event coach should make a bulleted list of all the topics the event is going to cover. These should be the only topics that the team members are directed to study. The coach should now create a resources list (National and state SO websites (all states), information websites, book titles, magazine articles, etc.) that present subject matter for each of the topics. The coach should personally review these resources to determine the content. You don't want to send your students looking at resources from which they glean little or inaccurate information (beware of Wikipedia).

Once your team members have their resources list, the coach must establish timelines for students to gather information and study the given subject matter. This will, of course, be a moving target; but without specific targets for the students to meet, your team will find itself behind the competition.

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At each of the scheduled meetings, the coach may want to quiz the students on the subject matter they should be up to date with. This can be done with quick-firing verbal questions, written questions, or with mobile apps such as Quizlet. Another option for presenting questions to the students is to email each of the students a written question sheet, and then review these "tests" at the scheduled practices.

Many study events allow students to bring binders of information to use while taking their tests. While it is important that coaches help students organize their materials, it is highly recommended that teams put together their own materials so that they know exactly what is in their binders and how to quickly retrieve the information they need.

This can sound like a lot of work, but by using the available resources, with time, an established routine, and persistence, events will be easier to manage. A team's time and effort can greatly affect the outcome at competition.

Build Events

As the name implies, the team is responsible for building a device (usually to be impounded) which will be used in competition. Teams must build AT LEAST one device. Devices frequently break or must be modified, so students should be prepared to build multiple devices. As in the real world, the best way to build any device is to build the device from a blueprint drawing/sketch. You may want to have the students make the drawing or sketch with the guidance of the event coach. With a detailed drawing/sketch, the team can make more meaningful changes to the device once testing begins. And you will make changes. So plan for them.

Another good practice for these events is to build a "jig", a set-up that allows the students to assemble a device more quickly and repeatedly. These require some thought but can be a useful practice.

To become competitive in these events, the team will wind up building more than one device or making many changes to the one. Don't let this discourage the team. It really is the only way to be successful.

For those events where the device will have to be capable of different target ranges, the successful team will have tested their device through the entire range of course set-ups that they might see at competition as described in the rules, and recording the results in a consistent format. These results can then be used on the day of the competition to set up the device to its best advantage for that particular configuration. Practices for these events must consist of running the device along tournament guidelines so that all team members get a feel for how the event will be run. It is highly advised that all members practice running the device until they can almost do it in their sleep. Be sure to have the team practice working in different roles. This way, if one of them is unable to compete, the other team members should be able to step in with confidence.

As for the actual building of the device, let the students do all the work while you guide them. The more they know about the quirks of their particular device, the better they will be when they have to do make adjustments in the middle of a competition get a successful run. Oftentimes, the winning team makes the right adjustment to their device based on a good guess; it's a feel they get when they are comfortable running their device.

SECTION E: FINANCIAL MATTERS

Expenses of Running a Science Olympiad Team

There are two registration fees that are mandatory. These include the registration fee for the regional tournament and the state registration fee. By registering your team with the state organization, you are able to obtain the rules booklet and are automatically registered with the national organization as well. In addition, if you would like your team to practice for the tournament at a local invitational tournament, there will be a registration fee for that too.

State Registration Fee	$ 260/ $125 alternate teams
Regional Registration Fee	$ 75/$25 alternate teams
Invitational Registration Fee	$ 75-125 each (fees vary)

While teams are not required to have team shirts on competition day, most teams are dressed in matching shirts. Typically, an inexpensive silk screen t-shirt will suffice.

Don't be shy about asking the school's principal to cover the cost of the shirt as a way to support the team or look for sponsors whose logos you can include on the shirts.

The events can be easily broken down into study events and building events. Each event has its own unique cost. Many study materials can be found on the Internet or in the public library, but you may wish to purchase some materials. Keep a collection of binders, books, and assorted materials from year to year as events tend to rotate in and out of the competition over several

years. Be sure to keep a record of who has the materials so they can be collected at the end of the season.

Study Event Materials:	
Books	$ 200
Photocopying/ Printing	$ 100
Misc Study Materials (Rocks, Minerals, Fossils)	$ 100
Training CD's	$ 100

Building events are the most expensive. The materials tend to be consumed and because the rules and parameters change from year to year it is difficult to reuse a device. It is advisable to seek donations or a sponsor for many of these events.

Building Event Materials (Varies depending on event)	
Mission Possible (B)	$ 400
Robot Tour (C)	$ 700
Tower (B&C)	$ 200
AirTrajectory (B&C)	$ 100
Scrambler (B)/Electric Vehicle (C)	$ 100
Helicopters (B&C)	$ 100
Bungee Drop (C)	$ 100

Building a competitive team involves more than having the students work hard at their events. They will enjoy the experience more if there is a certain amount of team building outside of preparing for the competition. It is advisable to get the whole team together at least once a month for some social activity. Light snacks are suggested. A year end party is a perfect ending to a great year.

Team Snacks	$ 200
Party Food	$ 150

Should your team qualify for the state competition, travel and hotel in East Lansing will be required. Both are variable expenses depending on the choice and quality of the hotel and how travel is handled. A school-sponsored bus may be a possibility, or transportation by private auto. Be sure to talk to your school's administration about what liability waivers and permission slips may be required to travel to any tournament, especially any that involve an overnight stay.

Hotel at the State Competition	varies
Travel to the State Competition	varies

The expenses involved in running a Science Olympiad team will vary widely. Consider that the expenses listed here are rough estimates and are for reference only.

Your team parents are excellent resources and may have possible connections to Employer Organizations that can help cover expenses. Consider reaching out to school administration to see if there are any funds available for your team. Contact local business sponsors, hold a Can Drive, look for grants. Also, there are many fundraising opportunities that can be found with a little research. Get creative!

Expenses to consider:

State Registration Fees Primary/Alternate	$ 260/$125
Regional Registration Fee Primary/Alternate	$75/$25
Invitational Registration Fee	$ 75-125 each
Team Shirts	$ 225
Study Materials	$ 500
Training CD's	$ 200
Supplies for Building Events	$ 1000
Food	$ 350
Hotel at the State Competition	varies
Travel to the State Competition	varies
	_____
Total of Anticipated Expenses	>$3000

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2024-2025 _*SCHOOL NAME*_ SCIENCE OLYMPIAD

Welcome to Science Olympiad!

My name is _____ and this is my ___ year as head coach at _____.
We are looking forward to another great year for _____ and Science Olympiad. If you are interested in participating in Science Olympiad for 2024-25 season, please fill out the following forms and return it to the school office by **_____, 2024**.

Student Information: This is where you provide contact information for me. Please make sure you indicate at least (1) email address because this will be the primary way I will communicate with students and parents. Make sure you fill out your name, phone number, grade level, and email information, and other questions. Fill in the Day/Time Matrix. Please indicate other activities you are participating in this fall and winter (days and times please).

Events and Descriptions List: Here is a list of the 23 events and their descriptions. Please mark your top ten (1-10) choices in order of interest/preference (1 best, 10 least) next to the event.

Tryout practices will begin in Sept/October, and the team and alternates will be selected by the holiday recess in December. I would like each event to have a coach assigned by the parent meeting so these practices can begin. Parent Meeting:_____. We will discuss coaching assignments, student event assignments, and expectations for all during the tryout period.

New Coaches: Please call me if you have questions about coaching and the time commitment required.

Alternates: There may be **Alternates** who will prepare for competitions and may be called to compete. This year, I would like every student to have a parent/relative coach for at least one event. In the middle of December**, Coaches** will provide me with grades for each student using the following formula:

Aptitude/Ability – 50%
Attendance/Participation – 25%
Teamwork/Attitude -- 25%

The team and alternates will be announced before the holiday break. (Note: 15 students are allowed to compete at each competition. There can be only (5) 9th graders on the roster per competition for schools with 7, 8 and 9th graders. For High School, there can only be up to 7 Seniors on the roster for a competition).

Important Dates:

Parent/Student Introductory Meeting: _____

State Coaches Workshop: Saturday December 7, 2024 at MSU.

Regionals Coaches Workshop: December 4, 2024 (South Lake High School)

Macomb Regional Competition: Saturday March 15th, 2025 (Macomb South Campus, Warren)

Michigan State Competition: Saturday April 26, 2025 (Michigan State University, East Lansing)

National Competition on Saturday May 23-24, 2025

If you have any questions, please contact _____ My email address is _____

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Please fill out the following information:

Student's Name_____ Grade _____

Phone# _____ Student Email: _____

Parents' Names _____

Parents' Emails _____

Please list your Coaching preference(s)- Please list Event(s):
_____

(Parents, older siblings, aunts/uncles: we really need your help to make this successful. I encourage you to get involved – there is no team without committed coaches!)

What activities (sports, clubs, church etc.) do you think you will participate in during the fall, winter and spring?

Have you participated in Science Olympiad before? _____yes _____no

If yes, what school and what events? (elementary and/or middle school)

Please indicate the days/times and reasons below that you will be unavailable to come to meetings from Oct through April:

	8-10am	10-12am	12-2pm	2-3:15 pm	3:30-5:00pm	5-7pm	7-9pm
Monday	**school**	**school**	**school**	**school**			
Tuesday	**school**	**school**	**school**	**school**			
Wednesday	**school**	**school**	**school**	**school**			
Thursday	**school**	**school**	**school**	**school**			
Friday	**school**	**school**	**school**	**school**			
Saturday							
Sunday							

2024-2025 Science Olympiad Interest Form DIVISION B

Please mark your top ten (1-10) choices in order of interest/preference (1 best, 10 least) next to the event.

_____ **Anatomy & Physiology** (B) - Participants will be assessed on their understanding of the anatomy and physiology for the human Integumentary, Muscular, and Skeletal systems.

_____ **Air Trajectory** (B) – Prior to the competition, teams will design, construct, and calibrate a single device capable of launching projectiles onto a target and collect data regarding device parameters and performance.

_____ **Crime Busters** (B) – Given a scenario, a collection of evidence, & possible suspects, students will perform a series of tests. Test results along with other evidence will be used to solve a crime and answer questions.

_____ **Codebusters** (B) - Teams will cryptanalyze and decode encrypted messages using cryptanalysis techniques for historical and modern advanced ciphers.

_____ **Disease Detective** (B) - Participants will use investigative skills in the scientific study of disease, injury, health and disability in populations or groups of people.

_____ **Dynamic Planet** (B) - Participants will demonstrate an understanding of the processes involving the cryosphere of the Earth including glaciers and other ice formations and processes.

_____ **Ecology** (B) - Participants will answer questions involving content knowledge and process skills in the area of ecology and adaptations in featured North American biomes.

_____ **Entomology** (B) – Students will be asked to identify insects and selected immature insects by order and family, answer questions about insects, and use or construct a dichotomous key.

_____ **Experimental Design** (B) - This event will determine a participant's ability to design, conduct and report the findings of an experiment entirely on-site

_____ **Fossils** (B) - Teams identify and classify fossils and demonstrate their knowledge of ancient life. Tasks will be related to interpretation of past environments and ecosystems, adaptations, evolutionary relationships, and the use of fossils in dating and correlating rock units.

_____ **Helicopter (B) -** Prior to the tournament, teams will construct, collect data on test flights, analyze and optimize a free flight rubber-powered helicopter to achieve maximum time aloft.

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_____ **Meteorology** (B) - Participants will use qualitative and quantitative analyses to demonstrate an understanding of the factors that influence world climate and climate change through the interpretation of climatological data, graphs, charts and images.

_____ **Metric Mastery** (B) - Teams will estimate and then measure properties of identical objects including mass, area, volume, density, force, distance, time, and temperature. Teams will also perform metric unit conversions.

_____ **Microbe Mission** (B) - Teams will answer questions, solve problems and analyze data pertaining to microbes

_____ **Mission Possible** (B) - Prior to the competition, participants design, build, test, and document a Rube Goldberg®- like Device that completes required Start and Final Actions through a series of specific actions.

_____ **Optics** (B) - Teams must participate in an activity involving positioning mirrors to direct a laser beam towards a target and are tested on their knowledge of geometric and physical optics.

_____ **Potions and Poisons** (B) – This event is about chemical properties and effects of specified toxic and therapeutic chemical substances, with a focus on household and environmental toxins or poisons.

_____ **Reach for the Stars** (B) - Participants will demonstrate an understanding of late-stage stellar evolution and stellar remnants, and their observation across the electromagnetic spectrum.

_____ **Road Scholar** (B) - Participants will answer interpretive questions that may use one or more state highway maps, USGS topographic maps, Internet-generated maps, a road atlas or satellite/aerial images

_____ **Scrambler** (B) - Teams design, build, and test a mechanical device, which uses the energy from a falling mass to transport an egg along a track as quickly as possible and stop as close to the center of a Terminal Barrier without breaking the egg.

_____ **Tower** (B) - Teams will design and build a Tower (Structure) meeting requirements specified in these rules to achieve the highest structural efficiency.

_____ **Windpower** (B) - Teams construct a blade assembly device prior to the tournament that is designed to capture wind power and complete a written test on the principles of alternative energy.

____ **Write It Do It (B)** - One student will write a description of an object and how to build it, and then the other student will attempt to construct the object from this description.

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2024-2025 Science Olympiad Interest Form DIVISION C

Please mark your top ten (1-10) choices in order of interest/preference (1 best, 10 least) next to the event.

_____ **Air Trajectory (C) –** Prior to the competition, teams will design, construct, and calibrate a single device capable of launching projectiles onto a target and collect data regarding device parameters and performance.

_____ **Anatomy & Physiology (C)** - Participants will be assessed on their understanding of the anatomy and physiology for the human Integumentary, Muscular, and Skeletal systems.

_____ **Astronomy** (C) - Teams will demonstrate an understanding of Stellar Evolution: Star Formation & Exoplanets.

_____ **Bungee Drop** (C) - Each team will design one elastic cord to conduct two separate drops at a given height(s) and attempt to get a drop mass, placed in a bottle, as close as possible to, but without touching, a landing surface.

_____ **Chemistry Lab** (C) - Teams will complete one or more tasks and answer a series of questions involving the science processes of chemistry focused in the areas of Periodicity and Equilibrium.

_____ **Codebusters** (C) - Teams will cryptanalyze and decode encrypted messages using cryptanalysis techniques for historical and modern advanced ciphers.

_____ **Disease Detective** (C) - Students will use investigative skills in the scientific study of disease, injury, health and disability in populations or groups of people.

_____ **Dynamic Planet** (C) - Participants will demonstrate an understanding of the processes involving the cryosphere of the Earth including glaciers and other ice formations and processes.

_____ **Ecology** (C) - Students will answer questions involving content knowledge and process skills in the area of ecology and adaptations in featured North American biomes.

_____ **Electric Vehicle** (C) – Teams must design, build and test one vehicle that uses electrical energy as its sole means of propulsion to travel as quickly as possible and stop close to a Target Point.

_____ **Entomology** (C) - Students will be asked to identify insects and selected immature insects by order and family, answer questions about insects, and use or construct a dichotomous key.

_____ **Experimental Design** (C) - This event will determine a participant's ability to design, conduct and report the findings of an experiment entirely on-site.

_____ **Forensics (C)** - Given a scenario and some possible suspects, students will perform a series of tests. These tests, along with other evidence or test results, will be used to solve a crime.

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_____ **Fossils (C)** - Teams identify and classify fossils and demonstrate their knowledge of ancient life. Tasks will be related to interpretation of past environments and ecosystems, adaptations, evolutionary relationships, and the use of fossils in dating and correlating rock units.

_____ **Geologic Mapping** (C) - Teams will demonstrate understanding in the construction and use of topographic maps, geologic maps, and cross sections, and their use in forming interpretations regarding subsurface structures and past depositional environments on Earth and other planetary bodies.

_____ **Helicopter** (C) -. Prior to the tournament teams design, construct and test free flight rubber-powered helicopters to achieve maximum time aloft.

_____ **Material Science** (C) – Teams will complete lab activities and answer a series of questions related to the materials science of ceramics with an emphasis on chemical and crystalline structure, and behavior.

_____ **Microbe Mission** (C) - Teams will demonstrate biology laboratory skills related to selected topics cell structure and biology

_____ **Optics** (C) - Teams will demonstrate physics laboratory skills related to selected topics including light reflection/refraction, colors of light. Timed stations with test questions, and “Laser shoot” challenges.

_____**Robot Tour** (C) - Teams use maps and remote sensing technology to explain human impact on the Earth.

_____**Towers** (C) - Team members design and build the most efficient tower.

_____**Wind Power** (C) - Teams will build a blade assembly that consists of any kind of propeller/pinwheel/rotor attached to a compact disc (CD) which will be used to capture wind power. Students will also be tested on their knowledge regarding alternative energy.

_____ **Write It Do It** (C) - Technical writing exercise where students write a description of a contraption given to them at competition, and their teammates will attempt to recreate it using that written description and materials provided.

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Science Olympiad Permission To Participate

I give permission for my daughter/son to participate with _____ in the 2025 Science Olympiad Tournaments:

Saturday, _____ at _____.

Saturday, _____ at _____.

Saturday, __March 15th, 2025___at Macomb College – South Campus, located at 14500 E. 12 Mile Rd., Warren.

I understand that if _____ qualifies for the State Competition, that I give my permission for my child to participate on Saturday April 26, 2025 in the Michigan Science Olympiad competition at Michigan State University in East Lansing.

I understand that adequate and appropriate supervision will be provided. I recognize, however, that unanticipated situations and problems can arise on any trip, school-sponsored or otherwise, which are not reasonably within the control of the supervising coaches or volunteers. In such instances, I agree that the school, coaches and volunteers are not to be held responsible in the event of an accident or injury and we will hold the school, coaches, and volunteers harmless from any costs, liability, or expenses related thereto.

Please fill out this permission slip and return to _____ or the school office by _____.

Student's Name _____

Address _____

Home Phone #_____ Student Cell #_____

Parent's Name: _____

Parent's Cell # _____

Parent's Signature:_____ Date: _____

Emergency Contact Person, in case parent is unavailable:

_____ Phone # _____

Please list any medical conditions, allergies, or medications that we need to be

aware of: _____

_____