



**NSBE** Jr.  
NATIONAL SOCIETY OF BLACK ENGINEERS

PRE-COLLEGIATE INITIATIVES

**RULE**

**BOOK**

**2023 - 2024**



National Society of Black Engineers

NSBE's mission is to increase the number of culturally responsible Black engineers who excel academically, succeed professionally, and positively impact the community

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# INTRODUCTION TO NSBE

## NSBE

The National Society of Black Engineers (NSBE) was founded in 1975 by six Black engineering students at Purdue University nicknamed the Chicago 6. The original aspiration was to establish a student organization to help improve the recruitment and retention of Black engineering students. NSBE is now the largest student-managed organization in the United States with more than 25,000 members.

NSBE is composed of more than 330 chapters on college and university campuses, 170 professional chapters nationwide and 290+ NSBE Jr. chapters. These chapters are geographically divided into six regions.

The NSBE mission is to increase the number of culturally responsible Black engineers who excel academically, succeed professionally and positively impact the community. For more information on NSBE, please visit [www.nsbe.org](http://www.nsbe.org).

In fulfillment of the NSBE objective to “stimulate and develop student interest in the various engineering disciplines,” various programs and competitions were created for pre-college students.

## PCI

The Pre-College Initiative (PCI) Program is the focus of the NSBE effort to promote college, academics, technology and leadership to pre-college students. Our primary goal is to encourage students in grades 6-12 to develop interest in Science, Technology, Engineering and Mathematics (STEM).

The mission of PCI is to lead the world in enhancing pre-college students’ academic, technical and leadership skills in order to maximize their success in life. The vision is to establish PCI as an incubator for our youth, where they can be nurtured and guided in their academic careers. NSBE Chapters support PCI through multiple programs.

## NSBE JR.

A vital component of the PCI program is NSBE Jr., which serves as the membership category for pre-college students and institutions that are officially chartered with NSBE. NSBE Jr. members and chapters are at the core of PCI, as they are the primary beneficiaries of PCI programs.

NSBE Jr. focuses on enhancing the education received by African-American and other minority pre-college students, as well as influencing these students to become tomorrow’s corporate executives, entrepreneurs and leaders. In this spirit, NSBE Jr. is the quintessential recruitment, teaching and preparation device for NSBE.

# KidWind<sup>®</sup>

## PROJECT

The KidWind Challenge is a hands-on design competition that engages students in STEM through the lens of wind energy. Student teams design and construct small wind turbines that they test, and then meet with a panel of judges to present their design process and demonstrate their conceptual knowledge on renewable energy. Teams also engage in a variety of Instant Challenges to gauge their on-the-spot teamwork and problem-solving skills.

When students participate in a KidWind Challenge they will:

- Discover the promise and limitations of wind energy technology
- Design, build and test a functional creative wind turbine
- Compete with their peers in a supportive environment

## KIDWIND TURBINE AND GENERATOR RULES

- Each team that registers must have its own turbine. You will not be allowed to modify another team's turbine and use it for testing. Teams cannot share one turbine and simply change blades or other parts for each team.
- The turbine must fit inside the wind tunnel and operate within its 48" x 48" internal dimensions. It is HIGHLY recommended that you design your turbine to fit within these dimensions with plenty of room. Sand bags or other weights will be available to hold the turbine in place, but we have found that almost all turbines shake and move a little in the tunnel, so it is a good idea to have extra space!
- There are no budgetary restrictions for your turbine design, but it is important to keep in mind that part of the judging process is the economical use of resources. Please use materials responsibly.
- You may only use 1 generator per turbine. You have three options for choosing what this generator will be:
  - You can use the KidWind Wind Turbine Generator (KW-GEN)
  - You can construct your own generator using a kit, online plans, or your own ingenuity.
  - You can select a different AC or DC generator that better matches how much power your turbine can generate.
- If you construct your own generator or use an advanced generator you will be placed in the OPEN DIVISION for energy production at all official KidWind Challenges. If you use a KidWind Generator, you will be placed in the KIDWIND GEN DIVISION. Judges will inspect your generator to determine in which division your team will participate. Please make sure that your generator is visible.
- Power must be generated solely by wind, using the wind tunnel.
- Your turbine can be built on either a vertical or horizontal axis.

- Your turbine may use a gearbox, pulley system, or similar mechanism to increase power output. You may use pre-manufactured gearboxes and other parts, but keep in mind that innovation is a critical judging criteria, and parts that you make on your own will earn you more points.
- You cannot use pre-manufactured wind turbine blades or airfoils/sheets.
- Your wind turbine must be free-standing. A tower/stand will not be provided.
- Metal, plexiglass, and similar blade materials are highly discouraged because they are potentially dangerous. On occasion, we have allowed these types of blades to be used, but only after local judges determined that there was an extremely low risk of failure due to assembly. Send us photos if you are unsure at [info@kidwind.org](mailto:info@kidwind.org). Please be aware that turbines will be disqualified if they are deemed unsafe by the local judges.
- The use of 3D printed parts and components is allowed. While you do not have to use files you created yourself, you should bring documentation about the CAD files to the Challenge and be prepared to discuss the design and the 3D printing process. Judges will want to make sure you understand this technology if you decide to use it.
- Students have used wheels from bicycles as part of their turbines. These are allowed since bike wheels are designed to spin at high RPM. Please be aware that if the wheel assemblies appear unsafe, local judges will disqualify these turbines.
- While the use of shrouds to channel the wind is permitted, the turbine and the shroud must fit COMPLETELY inside the wind tunnel to qualify. If any part of the shroud is outside of the wind tunnel during the test, the turbine will be disqualified. Any shroud that is used must be physically connected to your wind turbine (tower, nacelle, or other structure). It MUST move as you move the turbine and should be independent of your turbine.

## JUDGING AND AWARDS

Your team's turbine will be assessed by four categories, each weighted differently as shown in the diagram below. So brush up on your turbine knowledge, find the best materials and parts you can get your hands on and have some fun along the way.

## TURBINE JUDGING RUBRIC

- Energy Produced in Tunnel (35%)
- Turbine Design (30%)
  - Innovation (10%)
  - Blades (10%)
  - Drivetrain (10%)
- Report/Engineer's Notebook/Documentation (35%)

## ENERGY PRODUCED

The total energy output of your turbine over the 30-50 second trial period will be collected using data-logging software. Each team's energy output will be ranked relative to that of other competitors. Each team will receive points corresponding to its rank. In all cases, you want to generate as much energy as possible to get a high score.

## TURBINE DESIGN

Judges will inspect the parts of your wind turbine closely. They will also conduct a brief interview with your entire team to understand why you chose the parts you did and why you think they work. A panel of judges will examine your wind turbine design before testing it in the wind tunnel. You must be prepared to discuss/ defend the choices you incorporated into the design. The design criteria you will be judged on include:

- The choices and mechanisms by which you maximized power output.
- Craftsmanship of your design, creativity and environmental decisions (e.g., Did you use recyclable materials? Can you take your turbine apart after the competition and reuse the parts?).
- The judges will be very interested in how you developed and constructed specific parts of your turbine. Make sure you understand the decisions you made when constructed the following components.
  - 10% Blades
  - 10% Drivetrain
  - 10% Innovation

## DOCUMENTATION OF DESIGN

All students must complete a Project Profile Form. This sheet should be presented to your judges when you enter the judging room.

In addition to this sheet, teams may also share additional documentation with the judges that showcases, with more detail, their design process and knowledge of wind energy science. It is up to each team to determine how they want to document this part of their project. In the past we have seen short reports, engineer's notebooks, videos (maximum of 4 minutes), PowerPoints, and science fair poster boards

# APPLICATION PROCEDURE

KidWind registration is completed via an online application through Jotform. The 4 - 8 grade application can be found [here](#) and 9 - 12 grade application can be found [here](#). Each team interested in participating for the 2023 - 2024 program year must submit an application for the program and meet all the team requirements. Completing all of the information in the application is vital.

## KIDWIND REGISTRATION INFORMATION TEAM REQUIREMENTS

Every KidWind team must:

- Consist of a minimum of two (2) and up to a maximum of four (4) participants.
- Consist of a combination of students in grades 4 - 8 OR 9 - 12. These are separate age divisions, you can not create a team that includes students in grades 4 - 12 combined.
- Attend the 50th Annual Convention in Atlanta, GA. March 20 - March 24, 2024
- Consist of active NSBE Jr. members.
- Complete all application and registration requests before the deadlines.
- Chapter advisor and team coaches must provide a satisfactory NSBE background check with [Info Cubic](#)

## CRITICAL 2023 - 2024 KIDWIND DATES

For quick reference, the following target dates are listed to ensure your participation in NSBE KidWind. Please read responsibilities, events, and target timeline carefully. ALL links and resources are listed below and should be followed in the suggested order. For further information on the upcoming NSBE conferences, please visit [nsbe.org](http://nsbe.org)

<b>TEAM RESPONSIBILITY AND EVENTS</b>	<b>TARGET TIME FRAME (NO LATER THAN)</b>
<b>KidWind NEW Team Resources, Registration &amp; Application</b>	<p>For NEW teams: Visit the below KidWind links to learn more about the competition and how to create a team.</p> <ol style="list-style-type: none"> <li>1. <a href="#">Plan</a> for KidWind</li> <li>2. <a href="#">Rules and Judging Rubric</a> for Kidwind</li> <li>3. <a href="#">Gear</a> for KidWind (you do not have to purchase kits, its highly suggested you recycle materials around you classroom/home!</li> <li>4. <a href="#">Building guidelines</a> &amp; resources for KidWind</li> <li>5. Take a look and sign-up for upcoming workshops <a href="#">here</a></li> </ol> <p>Review the above resources and register your team on KidWind by Mon, December 4, 2023</p>
<b>ALL KidWind Teams NSBE Registration</b>	<p>ALL teams are required to submit a registration application for NSBE's KidWind 2023 - 2024 competition at Annual Convention.</p> <ul style="list-style-type: none"> <li>• 4 - 8 grade application <a href="#">here</a></li> <li>• 9 - 12 grade application <a href="#">here</a></li> </ul> <p>Registration deadline is Monday, January 8, 2024 Participation confirmation will be sent out by Monday, January 29, 2024.</p>
<b>National Competition</b>	<p>Held at NSBE's Annual Convention March 20 - March 24, 2024 in Atlanta, GA</p>

# MATHCOUNTS®

## MATCHCOUNTS® COMPETITION COMPONENTS

MATHCOUNTS® Written Team Competition is designed to be completed in 20 minutes at Annual Convention.

The Team Round consists of 10 problems that team members work to solve together. Team member interaction is permitted and encouraged. Calculator use is permitted.

The MATHCOUNTS Final Countdown Round is designed for teams to compete head-to-head. A problem is presented to two teams at a time. The question will be read aloud, as well as presented on a screen. Students can use a pencil and scratch paper and discuss with their teammates. Teams have 45 seconds to determine the answer and hit a buzzer when they are ready to answer. The other team can continue to work while their opponent is answering. The team that answers the most questions out of three correct moves on to the next round. Calculators are not permitted.

## COMPETITION RULES

Pencils and paper will be provided for students; however, students may bring their own pencils, pens and erasers if they wish. They may not use their own scratch paper or graph paper.

Calculators are permitted in the Team Round. Students may use any calculator (including programmable and graphing calculators) that does not contain a QWERTY (typewriter-like) keypad. Calculators that have the ability to enter letters of the alphabet but do not have a keypad in a standard typewriter arrangement are acceptable. Smart phones, laptops, iPads®, iPods®, personal digital assistants (PDAs) and any other “smart” devices are not considered to be calculators and may not be used during competitions. Students may not use calculators to exchange information with another person or device during the competition. Coaches are responsible for ensuring that their students use acceptable calculators, and students are responsible for providing their own calculators (and batteries).

Should there be a rule violation or suspicion of irregularities, the MATHCOUNTS® competition official has the obligation and authority to exercise his or her judgment regarding the situation and take appropriate action, which might include disqualification of the suspected student(s) from the competition.

Use of notes and other aids (including graph paper, rulers, compasses, protractors, reference tables, and dictionaries) is not permitted.

Communication with coaches is prohibited during rounds but is permitted during breaks. All communication between guests and students is prohibited during competition rounds.

## COMPETITION RULES

Each Team Round question is worth 2 points. There are 10 questions in the Team Round, so the maximum possible team score is  $10(2) = 20$ .

Ties will be broken as necessary to determine team prizes. The team with the higher Team Round score receives the higher rank. If a tie remains after this comparison, specific questions from the Team Round will be compared. Note: These are very general guidelines. Competition officials receive more detailed procedures.

In general, questions in the Team Round increase in difficulty so that the most difficult questions occur near the end of the round. In a comparison of questions to break ties, generally those who correctly answer the more difficult questions receive the higher rank.

## TEAM REGISTRATION:

- Each team must be a combination of exactly 4 students in grades 6 - 8.
- Consist of active NSBE Jr. members.
- Attend the 50th Annual Convention in Atlanta, GA. March 20 - March 24, 2024
- Complete all application and registration requests before the deadlines.
- Chapter advisor and team coaches must provide a satisfactory NSBE background check with [Info Cubic](#)

## APPLICATION PROCEDURE

MATHCOUNTS® registration is completed via an online application through Jotform. The application can be found [here](#). Each team interested in participating for the 2023–2024 program year must submit an application for the program and meet all of the team requirements. Completing all of the information in the application is vital.

## CRITICAL 2023 - 2024 MATHCOUNTS DATES

For quick reference, the following target dates are listed to ensure your participation in MATHCOUNTS. For further information on the upcoming NSBE Convention, please visit [convention.nsbe.org](http://convention.nsbe.org)

<b>TEAM RESPONSIBILITY AND EVENTS</b>	<b>TARGET TIME FRAME (NO LATER THAN)</b>
<b>MATHCOUNTS Team Registration and Resources</b>	Register your team(s) using our jotform <a href="#">here</a> . Submission deadline is Friday, January 19, 2024.. <ul style="list-style-type: none"><li>• Confirmation of team participation will be sent by Monday, Feb 5, 2024.</li></ul> Download the MATHCOUNTS school handbook <a href="#">here</a> for access to practice problems!
<b>National Competition</b>	Held at NSBE's Annual Convention March 20 - March 24, 2024 in Atlanta, GA



The VEX IQ Challenge provides elementary and middle school students (ages 8-14) with exciting, open-ended robotics, engineering and research project challenges that enhance their science, technology, engineering and mathematics (STEM) skills through hands-on, student-centered learning.

VEX IQ Challenge teams solve an annual game challenge by designing, building and programming a robot for the challenge. Students work in teams to score points in teamwork matches and in Robot Skills Challenge. The VEX IQ Challenge theme for the 2023-2024 season is Full Volume.

## VEX IQ CHALLENGE COMPETITION COMPONENTS:

The VEX IQ Full Volume game manual can be found [here](#)

## TEAM REGISTRATION:

- Each team must be a combination of students in grades 3 -8.
- Teams must consist of at least two (2) students and no more than ten (10).
- Attend the 50th Annual Convention in Atlanta, GA. March 20 - March 24, 2024
- Consist of active NSBE Jr. members.
- Complete all application and registration requests before the deadlines.
- Chapter advisor and team coaches must provide a satisfactory NSBE background check with [Info Cubic](#)

## APPLICATION PROCEDURE:

Each team must follow the below application procedure to be eligible to compete:

- Sign-up and/or register your team for the 2023 - 2024 season on [robotevent.com](http://robotevent.com). You will select "NSBE" as your affiliation.
- Submit registration to compete at NSBE's 50th Annual Convention by December 29, 2023 [here](#).
- Meet all critical 2023 - 2024 dates listed below.

## CRITICAL 2023 - 2024 VEX IQ DATES

For quick reference, the following target dates are listed to ensure your participation in NSBE KidWind. Please read responsibilities, events, and target timeline carefully. ALL links and resources are listed below and should be followed in the suggested order. For further information on the upcoming NSBE conferences, please visit [nsbe.org](https://nsbe.org).

<b>TEAM RESPONSIBILITY AND EVENTS</b>	<b>TARGET TIME FRAME (NO LATER THAN)</b>
<b>VEX IQ Team Registration &amp; Applications</b>	Register your team on <a href="https://robotevents.com">robotevents.com</a> and submit application to compete at NSBE's 50th Annual Convention <a href="#">here</a> by Friday, December 29th, 2023. <ul style="list-style-type: none"><li>• Confirmation of participation will be sent out by Friday, Jan 19, 2024.</li></ul>
<b>National Competition</b>	Held at NSBE's Annual Convention March 20 - March 24, 2024 in Atlanta, GA



The Robotics Education & Competition (REC) Foundation and NSBE developed a partnership to establish VEX Robotics Competition teams through NSBE's Pre-College Initiative (PCI). Each year, an exciting engineering challenge is presented in the form of a game. Students, with guidance from their teachers and mentors, build innovative robots and compete year-round in a variety of matches. In addition to learning valuable engineering skills, students gain life skills such as teamwork, perseverance, communication, collaboration, project management and critical thinking.

The VEX Robotics Competition prepares students to become future innovators with 95% of participants reporting an increased interest in STEM subject areas and pursuing STEM-related careers. The challenge for the 2023 – 2024 season is called Over Under. The object of the game is to attain a higher score than the opposing Alliance by Scoring Triballs in Goals, and by Elevating at the end of the Match.

## VEX ROBOTICS COMPETITION COMPONENTS:

The VEX IQ Full Volume game manual can be found [here](#)

## TEAM REGISTRATION:

- Each team must be a combination of students in grades 9 -12.
- Teams must consist of at least two (2) students and no more than ten (10).
- Attend the 50th Annual Convention in Atlanta, GA. March 20 - March 24, 2024
- Consist of active NSBE Jr. members.
- Complete all application and registration requests before the deadlines.
- Chapter advisor and team coaches must provide a satisfactory NSBE background check with [Info Cubic](#)

## APPLICATION PROCEDURE:

Each team must follow the below application procedure to be eligible to compete:

- Sign-up and/or register your team for the 2023 - 2024 season on [robotevent.com](http://robotevent.com). You will select "NSBE" as your affiliation.
- Submit registration to compete at NSBE's 50th Annual Convention by December 29. 2023 [here](#).
- Meet all critical 2023 - 2024 dates listed below.

# CRITICAL 2023 - 2024 VEX ROBOTICS DATES

For quick reference, the following target dates are listed to ensure your participation in NSBE KidWind. Please read responsibilities, events, and target timeline carefully. ALL links and resources are listed below and should be followed in the suggested order. For further information on the upcoming NSBE conferences, please visit [nsbe.org](https://nsbe.org).

<b>TEAM RESPONSIBILITY AND EVENTS</b>	<b>TARGET TIME FRAME (NO LATER THAN)</b>
<b>VEX Robotics Team Registration &amp; Applications</b>	Register your team on <a href="https://robotevents.com">robotevents.com</a> and submit application to compete at NSBE's 50th Annual Convention <a href="#">here</a> by Friday, December 29th, 2023.. <ul style="list-style-type: none"><li>• Confirmation of participation will be sent out by Friday, Jan 19, 2024.</li></ul>
<b>National Competition</b>	Held at NSBE's Annual Convention March 20 - March 24, 2024 in Atlanta, GA



Future City Competition is national competition that focuses on improving student's math, engineering and science skills. The program is open to students in the 6th, 7th and 8th grades who attend a public, private or home school. The aim of Future City is to provide an exciting educational engineering program for students. It combines a stimulating engineering challenge with an inquiry-based application to present their vision of a city of the future.

Middle-school students will be tasked to imagine, design and build cities of the future. After designing a virtual city (using SimCity), researching, designing and writing up their solution to city-wide issue and building a scale model of their city, teams will present their vision to a panel of judges. NSBE's Future City Competition will take place at the Annual Convention. This year's theme: Electrify Your Future. Design a 100% electrically powered city with energy generated from sources that keep their citizens and the environment healthy and safe.

**Important:** At Annual Convention, NSBE Jr Future City teams will be judged on their city essay, city presentation, city questions and answers, and their project plan. Bringing a physical model is not required.

Click [here](#) to learn more about the deliverables

## TEAM REGISTRATION:

- Each team must be a combination of students in grades 6 – 8
- Teams can have a minimum of four students and a maximum of 30
- Attend the 50th Annual Convention in Atlanta, GA. March 20 - March 24, 2024
- Teams must be comprised of active NSBE Jr. members
- Complete all application and registration requests before the deadlines.
- Chapter advisor and team coaches must provide a satisfactory NSBE background check with [Info Cubic](#)

## APPLICATION PROCEDURE:

Each team must follow the below application procedure to be eligible to compete:

- [Sign-up and/or register your team for the 2023 - 2024 season on futurecity.org.](#)
- Submit registration to compete at NSBE's 50th Annual Convention by December 29, 2023 [here](#).
- Meet all critical 2023 - 2024 dates listed below.

## CRITICAL 2023 - 2024 FUTURE CITY DATES

For quick reference, the following target dates are listed to ensure your participation in NSBE KidWind. Please read responsibilities, events, and target timeline carefully. ALL links and resources are listed below and should be followed in the suggested order. For further information on the upcoming NSBE conferences, please visit [nsbe.org](https://nsbe.org).

<b>TEAM RESPONSIBILITY AND EVENTS</b>	<b>TARGET TIME FRAME (NO LATER THAN)</b>
<b>Future City Team Registration &amp; Applications</b>	Register your team on <a href="https://futurecity.org">futurecity.org</a> and submit application to compete at NSBE's 50th Annual Convention <a href="#">here</a> by Friday, December 29th, 2023. <ul style="list-style-type: none"><li>• Confirmation of participation will be sent by Friday, Jan 19, 2024.</li></ul>
<b>National Competition</b>	Held at NSBE's Annual Convention March 20 - March 24, 2024 in Atlanta, GA



## TEN80 EDUCATION™

Ten80 Education™ produces standards-based STEM curricula and competitions, as well as a web-based Points Race that gamifies hands-on learning. Its three signature programs are the Ten80 Racing Challenge, Autonomous Vehicle (AV) Challenge, and Unmanned Aerial Vehicle (UAV) Challenge. (The Ten80-NSBE STEM League does not currently include the UAV Challenge.)

Through class, club, and camp curriculum, complete with materials, training, and support, Ten80 invites middle and high school students to practice the art of being STEM professionals. Youth in schools and out-of-school settings, supported by a community of mentors and educators, collaborate and compete in ways that mirror engineers, technicians, green transportation designers, business executives, marketing specialists, and professional motorsports teams. To demonstrate their skills, teams across the U.S. and China gather to compete at local, regional, and national Face-to-Face events each year, and/or submit their work for the online Points Race.

In addition to the curriculum and competitions, Ten80 draws on decades of experience with students and educators to produce custom, event-based STEM experiences with industry association partners, designed to help launch youth into career pathways while promoting meaningful community engagement. Notable custom event sponsors have included the U.S. Army, SEMA (Specialty Equipment Market Association), NASCAR, SME (formerly Society of Manufacturing Engineers), NSBE (National Society of Black Engineers), America Makes, Lightning eMotors, and the Denver Broncos.

## TEN80-NSBE STEM LEAGUE

There are multiple ways that teams can compete each season.

- Ten80 Racing Challenge teams and Ten80 Autonomous Vehicle Challenge teams prepare to compete in the Face-to-Face competition hosted each spring at the NSBE Annual Convention.
- Teams can also earn points and gain feedback from remote STEM mentors via the web-based STEM Challenge Points Race.
- NSBE Ten80 teams, and Points Race teams who have practiced with Ten80 curriculum and materials, are also invited to periodic regional competitions and an open Nationals hosted in late spring of each year in different locations throughout the U.S.

NSBE has committed to bringing members quality programming. A significant part of our commitment is the financial investment. Registering for NSBE's Ten80 program means you commit to completing the program in its entirety and will fully participate in the culminating activities at Annual Convention

## TEN80-NSBE STEM CHALLENGE TEAM REGISTRATION:

- Each team is entered into the Middle or High School series. If any single individual on a team is in grades 9-12, the team must be High School.
- Teams must be comprised of active NSBE Jr. members.
- Each team enters one or more of the following competition series: Racing Challenge, Autonomous Vehicle Challenge, and/or online Points Race.
- Attendance at the 50th Annual Convention in Atlanta, GA is required.
- Complete all application and registration requests before the deadlines.
- Chapter advisor and team coaches must provide a satisfactory NSBE background check with [Info Cubic](#)

## TEN80-NSBE STEM LEAGUE COMPETITION COMPONENTS

### TEN80 RACING CHALLENGE

Students own a motorsports team and their ultimate goal is to engineer performance. This includes personal performance, team performance and of course, race performance. The base technology for Racing Challenge teams is a 1/10th scale electric radio-controlled (RC) car that can be setup in over 4 million ways before re-engineering a single part. Curriculum can be implemented in school and in out-of-school settings using 6-10 week modules, a year-long program, or as core curriculum classwork.

### TEN80 AUTONOMOUS VEHICLE CHALLENGE

The Ten80 Autonomous Vehicle (AV) Challenge introduces students to coding through physical computing, with the promise of an exciting culminating competition. The AV Challenge starts with the electromechanical assembly of a 1/16th scale car. Through installation and experimentation with a series of sensors and coding, the car executes tasks as a self-driving vehicle resembling the fully autonomous cars that are navigating today's roads and highways.

To complete the Ten80 STEM Challenges as a STEM Innovation experience, students are invited to practice their Enterprise skills through teamwork and collaboration. The final goal is not only to compete with the car, but to showcase their business that centers on that vehicle, complete with branding and marketing projects such as elevator pitches and logo design.

Ten 80-NSBE STEM League teams can compete in two ways: (1) Face-to-Face at Regional Competitions, NSBE Finals and Ten80 Nationals; and (2) online Points Race in which teams upload submissions to earn points and team coaches receive additional support through the feedback on team investigations and projects.

Teams can compete in some or all of the following categories:

- Autonomous vehicle OR Head-to-Head Racing
- Data-Driven Design (encompasses DDD Projects, as well as category formerly known as MODS)
- Enterprise
  - Pitch and Presentations
  - Project Planning
  - Marketing & Public Relations
  - Graphic Design

## APPLICATION PROCEDURE:

NSBE teams choose CLASS or CLUB implementation and select the number of kits required for their optimal kit: students ratio. RETURNING teams who already have kits in working order only need to register for 2023-24 Face-to-Face competition, or Face-to-Face and Points Race competition. Registration provides renewed access to the curriculum. No additional kit is required.

CLASS implementation is ideal for chapters intending to implement the curriculum as a for-credit course. All options include registration for the 1st year into the Face-to-Face competition at the Annual Convention. There is an additional charge to enter the Points Race, the spring Ten80 Nationals, and for enhanced support.

Ten80 Racing Challenge and Autonomous Vehicle Challenge registration is completed via an online application through Jotform. The application for middle school can be found [here](#) and application for high school can be found [here](#). To fully complete registration, each team must also complete registration at [www.Ten80Education.com](http://www.Ten80Education.com). Each team interested in participating for the 2023 - 2024 program year must submit both applications for the program and meet all of the team requirements. Completing all of the information in the application is vital.

## CRITICAL 2023 - 2024 TEN80 NSBE STEM LEAGUE DATES

For quick reference, the following target dates are listed to ensure your participation in the Ten80 NSBE STEM League. Please read responsibilities, events, and target timeline carefully. ALL links and resources are listed below and should be followed in the suggested order. For further information on the upcoming NSBE conferences, please visit [convention.nsbe.org](http://convention.nsbe.org).

<b>TEAM RESPONSIBILITY AND EVENTS</b>	<b>TARGET TIME FRAME (NO LATER THAN)</b>
<b>Register with NSBE and Ten80 for Ten80 NSBE STEM at Annual Convention</b>	<p>Register your Ten80 team on <a href="http://www.ten80education.com">www.ten80education.com</a> and submit application to compete at NSBE's 50th Annual Convention here by Friday, December 29th, 2023.</p> <ul style="list-style-type: none"> <li>• Middle School team application <a href="#">here</a></li> <li>• High School team application <a href="#">here</a></li> <li>• Confirmation of participation will be sent by Friday, Jan 19, 2024.</li> </ul>
<b>Acquire access to Ten80 Education™ Curriculum (REQUIRED)</b>	September 1, 2023 through January 28, 2024 at the following link: <a href="#">Ten80 Curriculum</a>
<b>2023-24 Season Orientation and Training Webinars with Ten80</b>	September, October, November, January- Dates TBA. Refer to the calendar at the following link: <a href="#">Ten80 Calendar</a>
<b>Ten80 Points Race</b>	Opens October 2023 at the following link: <a href="#">Ten80 Points Race</a>
<b>NSBE FRC Ten80 Workshops</b>	Dates and Location TBD
<b>NSBE-Ten80 Nationals at 50th Annual NSBE Convention (REQUIRED- Register with NSBE for Convention AND Register with Ten80 for the competition)</b>	<p>Please register for Annual Convention no later than March 1, 2024 if you plan on competing in the Ten80 Competition on Friday, March 22, 2024 in Atlanta, GA.</p> <p>You can register for Convention here: <a href="http://convention.nsbe.org">convention.nsbe.org</a>.</p>



EXPLORE

## FIRST® LEGO® LEAGUE EXPLORE

**NSBE FIRST® LEGO® LEAGUE EXPLORE IS NOT AN OFFICIAL COMPETITION FOR FIRST WORLD FESTIVAL QUALIFICATION.**

### FIRST® LEGO® LEAGUE EXPLORE OVERVIEW

FIRST LEGO League Explore is one of three divisions by age group of the FIRST® LEGO® League program and serves children ages 6-10. This program inspires young people to experiment and grow their confidence, critical thinking, and design skills through hands-on learning. FIRST LEGO League was created through an alliance between FIRST® and LEGO® Education.

Guided by adult coaches, teams (up to six members, grades K – 4) explore a real-world scientific problem such as food safety, recycling, energy, etc. Then, they create a Team poster that illustrates their journey of discovery and introduces their team. They also construct a motorized model of what they learned using LEGO® elements. In the process, teams learn about teamwork, the wonders of science and technology and the FIRST® LEGO® League Explore Core Values, which include respect, sharing and critical thinking. At the close of each season, teams come together at NSBE's Annual Convention to show off their accomplishments, share ideas, celebrate and have fun! Every year, FIRST® LEGO® League Explore works with experts in the field to create a Challenge that relates to an important real world issue. Past challenges have been based on topics such as nanotechnology, climate, quality of life for the handicapped population and transportation.

The end result of the design process is a challenge with two defined parts - the Team poster and the Model. The culmination of the hard work for our teams is the participation in the showcase event at NSBE's Annual Convention. Volunteer reviewers at the event interview the teams to learn about their LEGO® Model and Team poster. All the teams are celebrated and leave with an award. This year's theme is MASTERPIECE<sup>SM</sup>

During the 2023-2024 FIRST season, FIRST® IN SHOWSM presented by Qualcomm, the future is yours to create! The FIRST LEGO League challenge is called MASTERPIECES. Children will learn about the role science, technology, engineering, and math (STEM) plays in the arts and will imagine and innovate new ways to create and communicate art across the globe. NSBE Jr. FIRST® LEGO® League Explore competition teams will be invited to compete and participate in all FIRST LEGO League events and activities held locally. It is through the local events by which a team would be eligible to advance to the World Festival. NSBE Jr FIRST LEGO League teams will also be invited to attend and participate at Annual Convention.

With your team registration, you'll receive access to digital resources through the FIRST® Thinkscape Portal, including the MASTERPIECE Team Meeting Guide and a static and interactive version of the Engineering Notebook. Click [here](#) for access instructions.

## FIRST® LEGO® LEAGUE EXPLORE TEAMS GET TO:

- Explore challenges facing today's scientists
- Discover real-world math and science
- Design and build a challenge-related model with a moving part using LEGO® elements
- Create a Team Poster and practice presentation skills
- Develop teamwork skills
- Choose to participate in festivals and showcases
- Engage in team activities guided by the FIRST® Core Values

## CORE VALUES

FIRST® LEGO® League expresses its philosophies of Gracious Professionalism and Coopertition 8 through its Core Values. We ask that everyone associated with every team understand and honor these Core Values:

- **Discovery:** We explore new skills and ideas.
- **Innovation:** We use creativity and persistence to solve our problems.
- **Impact:** We apply what we learn to improve our world.
- **Inclusion:** We respect each other and embrace our differences
- **Teamwork:** We are stronger when we work together
- **Fun:** We enjoy and celebrate what we do!

## TEAM POSTER

The Team Poster requires teams to illustrate their research and team journey. It provides an opportunity for them to share what they studied, what they learned and to show information about the team and each team member.

- Create a Team Poster using a flat poster board or tri-fold presentation board.
- Use words, drawings, photos and small objects to tell about what they have learned during their Challenge research.
- Show where they hunted for answers and describe the people they spoke with on their journey.
- Describe their Model and simple machine.
- Tell observers about the team itself.

# MODEL

The Model gets teams moving! Teams build a representation of what they are researching, based off the challenge and incorporate simple machines and movement into their creation. (Explore Model Building Instructions: [Book 1](#) | [Book 2](#))

- Create a Model that fits within a 15" x 15" footprint.
- Design a Model made of LEGO® parts. Typically, a team of six will use 400 to 1,000 LEGO® parts during the season.
- Must have at least one motorized piece on the Model.
- Create a simple machine using LEGO® ramps, levers, pulleys, gears, wheels and axles, screws, or wedges and incorporates this into their Model.

# APPLICATION PROCEDURE

NSBE FIRST® LEGO® League registration is completed via an online application through Jotform. The application can be found [here](#). To fully complete registration, each team must also complete registration at the [FLL Website](#). Each team interested in participating for the program year must submit an application for the program and meet all of the team requirements. Completing all of the information in the application is vital.

**IMPORTANT UPDATE: NSBE IS NO LONGER A FLL REGION. EACH TEAM MUST SELECT A LOCAL REGION AND COMPETE WITHIN THAT GROUP TO HOPEFULLY QUALIFY FOR FIRST'S WORLD FESTIVAL. NSBE'S ANNUAL CONVENTION IS NO LONGER A QUALIFIER!**

# NSBE FIRST® LEGO® LEAGUE EXPLORE REGISTRATION TEAM REQUIREMENTS

Every NSBE FIRST® LEGO® League Jr. team must:

- Complete registration on the [FLL website](#) to receive their team number.
- Submit an application to participate at NSBE's Annual Convention [here](#)
- Consist of a minimum of two (2) and up to a maximum of six (6) ACTIVE NSBE Jr members.
- Consist of a combination of students in kindergarten through 4th grade
- Attend the 50th Annual Convention in Atlanta, GA
- Assign a chapter advisor and team coach to complete the FIRST® Youth Protection Program (Each team needs two registered coaches through FIRST® )
- Chapter advisor and team coaches must provide a satisfactory NSBE background check with [Info Cubic](#).

**IMPORTANT NOTE: : A NSBE FIRST® LEGO® League coach can prepare more than one NSBE FIRST® LEGO® League team for the Annual Convention showcase.**

# CRITICAL 2023 - 2024 FLL EXPLORE DATES

For quick reference, the following target dates are listed to ensure your participation in the NSBE FIRST LEGO LEAGUE. Please read responsibilities, events, and target timeline carefully. ALL links and resources are listed below and should be followed in the suggested order. For further information on the upcoming NSBE conferences, please visit [convention.nsbe.org](http://convention.nsbe.org).

TEAM RESPONSIBILITY AND EVENTS	TARGET TIME FRAME (NO LATER THAN)
<p><b>Register with FIRST LEGO LEAGUE and NSBE to participate at NSBE's Annual Convention Showcase</b></p>	<ul style="list-style-type: none"> <li>• Register your team on the <a href="http://FLL website">FLL website</a></li> <li>• Register your team/chapter to attend Annual Convention at <a href="http://convention.nsbe.org">convention.nsbe.org</a></li> <li>• Register your team to participate at NSBE First Lego League showcase at Annual Convention no later than Friday, December 29, 2023 <a href="#">here</a></li> </ul>
<p><b>NSBE FIRST LEGO LEAGUE SHOWCASE</b></p>	<p>Held at NSBE's 50th Annual Convention from March 20 - March 24, 2024 in Atlanta, GA.</p> <p>You can register for Convention and receive updates/news here: <a href="http://convention.nsbe.org">convention.nsbe.org</a></p>



# FIRST® LEGO® LEAGUE CHALLENGE

**NSBE FIRST® LEGO® LEAGUE CHALLENGE IS NOT AN OFFICIAL COMPETITION FOR FIRST WORLD FESTIVAL QUALIFICATION.**

## FIRST® LEGO® LEAGUE CHALLENGE OVERVIEW

The FIRST® LEGO® League Challenge competition will only be held at national convention. Teams will build and program robots to compete in this year's MASTERPIECE themed challenge.

Each year FIRST® LEGO® League releases a challenge, which is based on a real-world scientific topic. Each challenge has three parts: the Robot Game, the Project and the Core Values. Teams of up to 10 students, with at least one adult coach, participate in the challenge by programming an autonomous robot to score points on a themed playing field (Robot Game), developing a solution to a problem they have identified (Project), all guided by the FIRST® LEGO® League Core Values. The culmination of the hard work for our teams is the participation in the competition at NSBE's Annual Convention.

In the 2023-2024 MASTERPIECES challenge, FIRST® LEGO® League students will imagine and innovate new ways to create and communicate art across the globe. NSBE Jr. FIRST® LEGO® League Challenge competition teams will be invited to compete and participate in all FIRST LEGO League events and activities held locally. It is through the local events by which a team would be eligible to advance to the World Festival. NSBE Jr FIRST LEGO League teams will also be invited to attend and participate at Annual Convention.

## FIRST® LEGO® LEAGUE COMPETITION COMPONENTS

### GENERAL

- Team members must make all decisions and do all the work on the Robot Game and Project. This includes deciding on strategy, building, programming, researching, choosing a problem and innovative solution and presenting at a tournament.
- Anyone who works with the team (coaches, mentors, topic experts, parents, etc.) may teach team members new skills, handle logistics for the team, ask questions to get team members thinking and remind them of the FIRST® LEGO® League rules. Adults play an important role in coaching and supporting their team, but the team's robot and project should be the work of team members.

## TEAM MEMBERS

- A team must have a minimum of two (2) and a maximum of ten (10) students.
- Students may be members of only one (1) FIRST® LEGO® League team per season.
- Allowed ages in U.S., Canada and Mexico: 9 – 14 years.
- No team member may be outside the maximum allowed age in your region prior to January 1 of the year the challenge is released

## ROBOT GAME

- Each team's robot must be built in accordance with all allowable parts, software and other rules.

## PROJECT

- Teams must demonstrate completion of all three (3) steps of the project (identify a problem, develop an innovative solution and share with others) as part of their presentation and fulfill any other requirements as defined in the annual project document.

## CORE VALUES

FIRST® LEGO® League expresses its philosophies of Gracious Professionalism and Coopertition 8 through its Core Values. We ask that everyone associated with every team understand and honor these Core Values:

- **Discovery:** We explore new skills and ideas.
- **Innovation:** We use creativity and persistence to solve our problems.
- **Impact:** We apply what we learn to improve our world.
- **Inclusion:** We respect each other and embrace our differences
- **Teamwork:** We are stronger when we work together
- **Fun:** We enjoy and celebrate what we do!

## JUDGING AND AWARDS

Official tournaments, including the event at NSBE's Annual Convention, must follow the judging and awards structure determined by FIRST® LEGO® League. Although the audience mostly sees teams playing the Robot Game at tournaments, teams are also being judged on:

- Core Values
- Project
- Robot Design

Robot Game Rules can be found [here](#), judging rubrics can be found [here](#), and awards descriptions can be found [here](#)

# APPLICATION PROCEDURE

NSBE FIRST® LEGO® League registration is completed via an online application through Jotform. The application can be found [here](#). To fully complete registration, each team must also complete registration at the [FLL Website](#). Each team interested in participating for the program year must submit an application for the program and meet all of the team requirements. Completing all of the information in the application is vital.

**IMPORTANT UPDATE: NSBE IS NO LONGER A FLL REGION. EACH TEAM MUST SELECT A LOCAL REGION AND COMPETE WITHIN THAT GROUP TO HOPEFULLY QUALIFY FOR FIRST'S WORLD FESTIVAL. NSBE'S ANNUAL CONVENTION IS NO LONGER A QUALIFIER!**

## NSBE FIRST® LEGO® LEAGUE CHALLENGE REGISTRATION TEAM REQUIREMENTS

Every NSBE FIRST® LEGO® LEAGUE team must:

- Complete registration on the [FLL website](#) to receive their team number.
- Submit an application to participate at NSBE's Annual Convention [here](#)
- Consist of a minimum of two (2) and up to a maximum of ten (10) ACTIVE NSBE Jr members.
- Consist of a combination of students in 4 - 8 grade.
- Attend the 50th Annual Convention in Atlanta, GA
- Assign a chapter advisor and team coach to complete the FIRST® Youth Protection Program (Each team needs two registered coaches through FIRST® )
- Chapter advisor and team coaches must provide a satisfactory NSBE background check with [Info Cubic](#).

**IMPORTANT NOTE: : A NSBE FIRST® LEGO® League coach can prepare more than one NSBE FIRST® LEGO® League team for the Annual Convention showcase.**

# CRITICAL 2023 - 2024 FLL CHALLENGE DATES

For quick reference, the following target dates are listed to ensure your participation in the NSBE FIRST LEGO LEAGUE. Please read responsibilities, events, and target timeline carefully. ALL links and resources are listed below and should be followed in the suggested order. For further information on the upcoming NSBE conferences, please visit [convention.nsbe.org](http://convention.nsbe.org).

TEAM RESPONSIBILITY AND EVENTS	TARGET TIME FRAME (NO LATER THAN)
<p><b>Register with FIRST LEGO LEAGUE and NSBE to participate at NSBE's Annual Convention Showcase</b></p>	<ul style="list-style-type: none"> <li>• Register your team on the <a href="http://FLL website">FLL website</a></li> <li>• Register your team/chapter to attend Annual Convention at <a href="http://convention.nsbe.org">convention.nsbe.org</a></li> <li>• Register your team to participate at NSBE First Lego League showcase at Annual Convention no later than Friday, December 29, 2023 <a href="#">here</a></li> </ul>
<p><b>NSBE FIRST LEGO LEAGUE SHOWCASE</b></p>	<p>Held at NSBE's 50th Annual Convention from March 20 - March 24, 2024 in Atlanta, GA.</p> <p>You can register for Convention and receive updates/news here: <a href="http://convention.nsbe.org">convention.nsbe.org</a></p>



# FIRST® TECH CHALLENGE

**NSBE FIRST® TECH CHALLENGE IS NOT AN OFFICAL COMPETITION FOR FIRST WORLD FESTIVAL QUALIFICATION.**

## FIRST® TECH CHALLENGE OVERVIEW

FIRST® Tech Challenge (ages 12-18) encourages teams to design, build, program and engage in thrilling robotics competitions. Guided by adult coaches and mentors, students develop STEM skills and practice engineering principles, while realizing the value of innovation and teamwork. The reusable robot kit can be coded using a variety of programming languages. With Gracious Professionalism®, students are encouraged to create team identities and be an ambassador for FIRST and STEM in their communities.

In the CENTERSTAGE<sup>SM</sup> presented by Raytheon Technologies challenge, debuting September 9, 2023, FIRST Tech Challenge teams will raise the curtain on the power of design, creativity, and precision to create all new experiences.

NSBE Jr FIRST Tech Challenge teams will be invited to compete and participate in all FIRST Tech Challenge events held locally. It is through the local events by which a team would be eligible to advance to FIRST Championship.

Main landing page for FTC <https://www.firstinspires.org/robotics/ftc>

## FIRST® TECH CHALLENGE COMPETITION COMPONENTS

### GENERAL

- Team members must make all decisions and do all the work on the Robot Game and Project. This includes deciding on strategy, building, programming, researching, choosing a problem and innovative solution and presenting at a tournament.
- Anyone who works with the team (coaches, mentors, topic experts, parents, etc.) may teach team members new skills, handle logistics for the team, ask questions to get team members thinking and remind them of the FIRST® LEGO® League rules. Adults play an important role in coaching and supporting their team, but the team's robot and project should be the work of team members.
- There are three formats of Competition a Team might experience this season; traditional, remote, and hybrid events. This manual describes traditional events; however, some Teams may switch between formats depending on social distancing rules within their state/region. Below are descriptions of these formats.

## TRADITIONAL EVENTS

A traditional FIRST Tech Challenge event is typically held in a school or college gymnasium, where Teams use Robots to compete in the current season's game challenge. Teams participating in traditional events compete with Alliance partners in a head-to-head style of competition on the official FIRST Tech Challenge Playing Field. Teams compete in a series of Matches that determine their ranking at a traditional Tournament. The size of a traditional event can range anywhere from 8 Teams to over 50 Teams competing in one place. Traditional events are generally scheduled by the local program delivery partner, and are run by many volunteers including referees, judges, scorekeepers, queuers, and other key volunteers. Traditional events consist of Robot inspections, Robot Competitions, judging interviews (for most Competitions), and an overall celebration of Teams and their accomplishments. [Game Manual Part 1 - Traditional Events](#)

## REMOTE EVENTS

Remote events were developed to mimic traditional FIRST Tech Challenge events, while practicing social distancing guidelines. Since Teams may not be able to gather and compete in the traditional head-to-head competition format, the season's official full Playing Field has been adapted to allow Teams to play as a single Team. Remote Teams may order an official half version of this season's field, or compete using a modified version of the field, which will be released at kickoff on 9/9/2023. Teams will sign-up for events and will be provided with a time window to submit their own Match scores, which will determine their rankings. Unlike traditional events, the scoring of the official Matches is done by the Team, rather than an event volunteer. Teams will participate in judging interviews via video conference when judging is part of the event. To learn more about remote events, please read the [Game Manual Part 1 – Remote Events](#) manual.

## HYBRID EVENTS

A Hybrid event blends traditional in-person match play with judging interviews held via video conference. Teams use Robots to compete in the current season's game challenge in the traditional style of an in-person event and participate in judging remotely using a video conferencing tool for their initial and follow-up presentations with the judge panel.

## TEAM MEMBERS

- A team must have a minimum of two (2) and a maximum of fifteen (15) students.
- Students may be members of only one (1) FIRST® Tech Challenge team per season.
- Allowed grades in U.S., Canada and Mexico: 7th - 12th.
- No team member may be outside the maximum allowed grade range in your region prior to January 1 of the year the challenge is released.

# CORE VALUES

FIRST® Tech Challenge expresses its philosophies of Gracious Professionalism and Coopertition 8 through its Core Values. We ask that everyone associated with every team understand and honor these Core Values:

- **Discovery:** We explore new skills and ideas.
- **Innovation:** We use creativity and persistence to solve our problems.
- **Impact:** We apply what we learn to improve our world.
- **Inclusion:** We respect each other and embrace our differences
- **Teamwork:** We are stronger when we work together
- **Fun:** We enjoy and celebrate what we do!

# APPLICATION PROCEDURE

NSBE FIRST® Tech Challenge registration is completed via an online application through Jotform. The application can be found [here](#). To fully complete registration, each team must also complete registration at the [FLL Website](#). Each team interested in participating for the program year must submit an application for the program and meet all of the team requirements. Completing all of the information in the application is vital.

**IMPORTANT UPDATE: NSBE IS NO LONGER A FLL REGION. EACH TEAM MUST SELECT A LOCAL REGION AND COMPETE WITHIN THAT GROUP TO HOPEFULLY QUALIFY FOR FIRST'S WORLD FESTIVAL. NSBE'S ANNUAL CONVENTION IS NO LONGER A QUALIFIER!**

# NSBE FIRST® TECH CHALLENGE REGISTRATION TEAM REQUIREMENTS

Every NSBE FIRST® Tech Challenge team must:

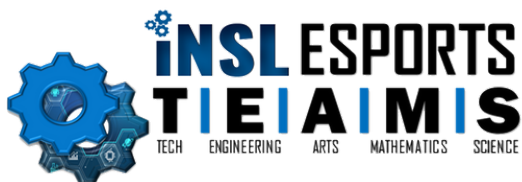
- Complete registration on the [FLL website](#) to receive their team number.
- Submit an application to participate at NSBE's Annual Convention [here](#)
- Consist of a minimum of two (2) and up to a maximum of fifteen (15) ACTIVE NSBE Jr members.
- Consist of a combination of students in 7 - 12 grade.
- Attend the 50th Annual Convention in Atlanta, GA
- Assign a chapter advisor and team coach to complete the FIRST® Youth Protection Program (Each team needs two registered coaches through FIRST® )
- Chapter advisor and team coaches must provide a satisfactory NSBE background check with [Info Cubic](#).

**IMPORTANT NOTE: : A NSBE FIRST® Tech Challenge coach can prepare more than one NSBE FIRST® Tech Challenge team for the Annual Convention showcase.**

## CRITICAL 2023 - 2024 FTC DATES

For quick reference, the following target dates are listed to ensure your participation in the NSBE FIRST® Tech Challenge. Please read responsibilities, events, and target timeline carefully. ALL links and resources are listed below and should be followed in the suggested order. For further information on the upcoming NSBE conferences, please visit [convention.nsbe.org](https://convention.nsbe.org).

TEAM RESPONSIBILITY AND EVENTS	TARGET TIME FRAME (NO LATER THAN)
<p><b>Register with FIRST TECH CHALLENGE and NSBE to participate at NSBE's Annual Convention Showcase</b></p>	<ul style="list-style-type: none"> <li>• Register your team on the <a href="https://fll.org">FLL website</a></li> <li>• Register your team/chapter to attend Annual Convention at <a href="https://convention.nsbe.org">convention.nsbe.org</a></li> <li>• Register your team to participate at NSBE First Lego League showcase at Annual Convention no later than Friday, December 29, 2023 <a href="#">here</a></li> </ul>
<p><b>NSBE FIRST TECH CHALLENGE SHOWCASE</b></p>	<p>Held at NSBE's 50th Annual Convention from March 20 - March 24, 2024 in Atlanta, GA.</p> <p>You can register for Convention and receive updates/news here: <a href="https://convention.nsbe.org">convention.nsbe.org</a></p>



# INTERNATIONAL STEM LEAGUE®

## INTERNATIONAL STEM LEAGUE® OVERVIEW

iNSL Esport T.E.A.M.S. helps students explore data driven problem solving through gaming-related challenges. iNSL is a nonprofit with 25 years in project-based learning and a focus on helping students pursue and remain in STEM careers. The International STEM League offers PreK to Professional learning in 12 countries on 4 continents.

Democratize data, cyber pathways, and AI with Esports. You choose the theme. You choose the games. We help with data analysis, design for prototyping curriculum, and motivation to succeed. iNSL partners with industry mentors to keep content relevant and exciting.

Partners at iRacing have provided hundreds of registrations to get NSBE students on track with simulated racing. Test racing knowledge on simulated tracks, and learn sim car setup, vehicle graphics, track strategy and teamwork in the iNSL iRacing Academy. Saturday practices start in late September with Time Attacks and Heat Races to prep for live sanctioned races in April.

## INSL-NSBE T.E.A.M.S. LEAGUE

How you game (or if you game) is up to you. Data driven scores are only one of the ways teams can increase points.

- **Climb the points Leaderboard from Oct-March in the Esport T.E.A.M.S. Academic Season! Earn points in Challenge-Focused Web Quests, Monthly STEMvestigations, and Esport Challenge Project submissions**
- **iNSL iRacing teams get on track and up to speed on private tracks, at optional Saturday league practices, in sanctioned Time Attacks and in Feb-March Heat Races. Compete in head-to-head sim racing at the NSBE Annual Convention.**
- **T.E.A.M.S. Challenges: Submit gaming industry related design & prototyping projects for early review by industry mentors to earn points Oct-March. Then pitch final projects (after feedback) at the NSBE Annual Convention.**
- **Dashboard Challenge: Complete the NO CODING Data Analyst Course to earn a real Data Analyst certificate from Eisengard AI. Enter Digital Dashboard projects created in the course (community survey app + data visualization) to compete for remote internships and prizes.**

## INSL-NSBE T.E.A.M.S COMPETITION

Student teams tackle systems and engineering design for the gaming industry. Learn in Esport T.E.A.M.S. Academy online with hands-on investigations and video covering the industry / careers / roles associated with the project theme. Middle and high school students explore data driven problem solving through popular Esport-related challenges. Pick one of the following options to compete or showcase with iNSL-NSBE T.E.A.M.S. this season: iNSL iRacing, Esport T.E.A.M.S. Leaderboard (points race) and Esport T.E.A.M.S. Challenge LIVE (prototype and pitch). Support your challenge project by competing for prizes in multiple categories.

### AWARD CATEGORIES:

- Graphic Design Awards
- Logbooks & Documentation Award
- Presentation Award
- Prototyping Award
- Peripherals & Electronics Award
- Community Impact Award
- 3 Minute Product Pitch (Finals i Atlanta only) Trophy & Remote Internship

### AWARD CATEGORIES:

#### **INSL IRACING T.E.A.M.S.**

Students form a sim racing team to practice data driven decisions that boost performance on and off the track. Learn strategies for improving teamwork, vehicle setup, and data analytics for gaming while building a competitive sim racing club. Online courses contribute to team points and introduce the 5 Ps (Planning, Performance, Prototyping, Peripherals, PR) that contribute to success. Teams prepare on private tracks, at optional Saturday league practices, in asynchronous Time Attacks and in Feb-March Livestreamed Heat Races. iRacing Series competitors compete in head-to-head sim racing at the NSBE Annual Convention.

#### **ESPORTS T.E.A.M.S. LEADERBOARD (POINTS RACE)**

Climb the points Leaderboard from Oct-March in the Esport T.E.A.M.S. Academic Season! Choose one or more challenge projects from the online academy. Earn points for the team by mastering curriculum, conquering STEMvestigations and uploading category submissions for the Esport T.E.A.M.S. Challenge project of your choice. Play favorite PC, console or mobile games & use data to raise scores. Compete for individual medals, team awards, and prizes.

#### **ESPORT T.E.A.M.S. CHALLENGE LIVE**

Teams may submit 1 Esport Design & Prototyping Project for early review by industry mentors to earn points in multiple categories during the Academic Season. Resubmit final projects (after feedback) to compete at NSBE Annual Convention.

## PROTOTYPING CHALLENGE

### **iNSL iRacing Innovation Challenge:**

Prototype a custom iRacing Sim Rig or iRacing Wheel-and-Pedal Peripheral for early review by industry mentors to earn points in the Academic Season, then enter final projects (after feedback) at the NSBE Annual Convention.

### **iNSL Mobile MODS Challenge:**

Prototype a custom adaptive design to make gaming more accessible and enjoyable for all gamers. The curriculum example is a mobile racing wheel for Rocket League, Forza Racing, or Mario Kart style games. Adaptive design for any gaming platform is eligible.

### **Legendary Soft Circuits and Fortnite Wearables:**

Design memorable team apparel or cosplay with electric flair. Incorporate LEDs to create products that advertise / market your Chapter!

### **Sustainable Stadiums:**

Take an MLB the Show (or other virtual stadium design) from screen to tabletop with an architectural scale model. Bonus points for addressing sustainability and incorporating electronics.

### **Tackling Augmented Reality:**

Learn the basics of wire framing, app design and extended realities to launch an AR based mobile app. Bonus points for concepts that benefit your community.

### **Wild Card Challenge:**

Are you into robots, AI, bee keeping? Repurpose and submit a Data-Driven "Wild Card" Project of your choice. The core of the project must prove that your team used data driven problem solving no matter the topic. See the "Wild Card" rubric for details.

### **Dashboard Challenge:**

Take the NO CODING "Democratizing Data with AI" Course to earn a real Data Analyst certificate from Eisengard AI. Enter Digital Dashboard projects created in the course (community survey app + data visualization) to compete for remote internships and prizes.

- Community Impact
- 3 Minute Product Pitch (Finals in Atlanta only)

## INSL-NSBE T.E.A.M.S REGISTRATION

- Each team is entered into the Middle or High School series. If any single individual on a team is in grades 9-12, the team must be High School.
- Teams must be comprised of active NSBE Jr. members.
- Each team enters one or more of the following competition series: iNSL iRacing Series; iNSL Esport T.E.A.M.S. Academic Season; iNSL Esport T.E.A.M.S. Challenge; High School Dashboard Challenge.
- Attendance at the 50th Annual Convention in Atlanta, GA is required. Complete all application and registration requests before the deadlines.
- Chapter advisor and team coaches must provide a satisfactory NSBE background check with [Info Cubic](#).

## T.E.A.M.S APPLICATION PROCEDURE:

Register for iNSL iRacing Challenge or Esport T.E.A.M.S Challenge.

### Registration includes the following resources:

- Access curriculum for All Esport T.E.A.M.S. options during this premier season.
- Curriculum, Coaching Files and Student Guides
- 1 Adult Membership with Student Sub-accounts.
- 5-Session, 10-Session and Extended Schedules / Agendas for Planning
- 1 Points Race Competition Entry & Leaderboard App
- Compete in Prototyping & Presentation at the NSBE Annual Convention.
- Showcase projects in the Metaverse.
- 12 Fully Funded Data Analyst Course Registrations

### iNSL iRacing Challenge registration also includes:

- 1 peripheral prototyping materials pack to support collaborative development of the wheel, pedal and control panel for racing sim rig or racing tabletop setup.
- 12 iRacing Annual Registration codes
- Source your own wheel for iRacing or [add a rig package](#) when registering.

Esport T.E.A.M.S. Challenge registration does not include a materials kit. Chapters are welcome to source their own materials, but materials and kits for each challenge are available for purchase from our partners [HERE](#).

Register online at [iNSL.org/NSBE](https://iNSL.org/NSBE) after September 1st, 2023.

Learn more about challenges, rubrics, and dashboards at [iNSL-competition.org](https://iNSL-competition.org)

# CRITICAL 2023 - 2024 INSL DATES

For quick reference, the following target dates are listed to ensure your participation in the iNSL-NSBE T.E.A.M.S competition at Annual Convention. Please read responsibilities, events, and target timeline carefully. ALL links and resources are listed below and should be followed in the suggested order. For further information on the upcoming NSBE conferences, please visit [convention.nsbe.org](http://convention.nsbe.org).

TEAM RESPONSIBILITY AND EVENTS	TARGET TIME FRAME (NO LATER THAN)
<p><b>Register with INTERNATIONAL STEM LEAGUE and NSBE to participate at NSBE's Annual Convention Showcase</b></p>	<ul style="list-style-type: none"> <li>• Register your iNSL team at <a href="#">here</a></li> <li>• Register your team/chapter to attend Annual Convention at <a href="http://convention.nsbe.org">convention.nsbe.org</a></li> <li>• Register your team to participate in iNSL-NSBE competition at Annual Convention no later than Friday, December 29, 2023.               <ul style="list-style-type: none"> <li>◦ Middle School <a href="#">here</a></li> <li>◦ High School <a href="#">here</a></li> </ul> </li> </ul>
<p><b>iNSL-NSBE Competition at Annual Convention</b></p>	<p>Held at NSBE's 50th Annual Convention from March 20 - March 24, 2024 in Atlanta, GA.</p> <p>You can register for Convention and receive updates/news here: <a href="http://convention.nsbe.org">convention.nsbe.org</a></p>



# TRY-MATH-A-LON (TMAL)

## TMAL OVERVIEW

Try-Math-A-Lon (TMAL) is a tutoring program meant to foster good study habits for minority students, help prepare for standardized test exams such as the ACT and SAT and promote competition and good sportsmanship. The TMAL competition is held between teams composed of high school students in grades 9-12. The purpose of the competition is to help groom TMAL team members for success in STEM courses and prepare them for standardized SAT/ACT testing.

TMAL consists of three components:

1. Regional Conference Competitions
2. Performance Assessment Test (PAT)
3. National Convention Quiz Bowl

Please read thoroughly to have a good understanding of each aspect.

The TMAL rules should be used to guide TMAL coaches/advisors in preparation for the three components of the program. TMAL coaches/advisors are encouraged to prepare their teams as early as possible and share TMAL preparatory materials with other math, science, or technology professionals who may be able to assist TMAL teams with competition preparation. TMAL coaching can begin as early as the start of the school year through March of the next year.

## TEAM REGISTRATION

- Each team will consist of four students and a mandatory alternate
- Teams can be a combination of students in grades 9th - 10th for Lower Division and grades 11th - 12th for Upper Division.
- TMAL teams can consist of students from the same grade level (e.g., four seniors or four sophomores)
- Teams must be comprised of active NSBE Jr. members
- Attendance at the 50th Annual Convention in Atlanta, GA is required

# TMAL COMPETITION COMPONENTS

All teams have the opportunity to compete at the TMAL national competition to be held at the NSBE National Convention.

## TMAL COMPETITION CURRICULUM

TMAL questions are written with the curricula for grades 9th - 10th and 11th - 12th in mind. In addition, many problems are designed to challenge and accelerate student learning and questions become progressively more difficult at each level of the TMAL competition. Math topics include:

Lower Division: 9th - 10th grade topics

- Algebra and Functions
- Data Analysis, Statistics and Probability, Geometry, Measurements, Numbers, and Operations
- Pre-Calculus
- Problem Solving

Upper Division 11th - 12th grade topics

- Algebra and Functions
- Data Analysis, Statistics and Probability, Geometry, and Measurements
- Calculus
- Trigonometry
- Numbers and Operations
- Problem Solving

## EVENT 1: FALL REGIONAL CONFERENCE COMPETITIONS

**On-site and Virtually Fall Regional Conferences**

TMAL Quiz Bowls will take place in-person and virtually during the 2023 Fall Regional Conferences. Lower and Upper Division team winners from each region will receive an award towards National Convention. Further details will be shared during the September and October Advisor meetings and communications on how to register and where FRCs are being held. FRC registration is required to participate in this competition.

## EVENT 2: PERFORMANCE ASSESSMENT TEST (PAT)

School Year During NSBE Jr. Chapter Meetings

The Performance Assessment Test (PAT) evaluates our NSBE Jr. high school members' college mathematics pathway aptitude and readiness, promotes critical thinking skills and encourages teamwork when preparing for the exams. These tests are timed and measure the teams' ability to solve problems using math concepts. This year, we are introducing the Pre-Performance Assessment Test and the Official Performance Assessment Test.

The PAT exams will be administered through an online application prior to National Convention. All active NSBE Jr. chapters will receive a link to the Pre- and Official PAT on **October 2, 2023** and **January 15, 2024**, respectively. Each team advisor will be responsible for proctoring the assessments or securing a test proctor. The designated proctor should not be a parent or affiliated with the TMAL team. Each team will have one hour to complete the test. All teams participating in TMAL must complete the PAT and submit results to [pebpci@nsbe.org](mailto:pebpci@nsbe.org) by **November 6, 2023** for the Pre-PAT and **February 19, 2024** for the Official PAT.

The NSBE Jr. members of the Lower and Upper Division teams with the best improvement between their Pre and Official PAT results will receive a discount for their National Convention registration. Teams that are eligible for this award must participate in the Pre and Official PAT, as well as attend the National Convention in Atlanta, GA.

## EVENT 3: NATIONAL CONVENTION QUIZ BOWL

On-Site During National Convention

### Game Rules and Guidelines

All teams that register for the National Convention's TMAL Quiz Bowl will be able to compete. Below are the game rules and guidelines that will be implemented.

- There are (6) categories covered in the Lower and Upper Division. TMAL competition:

Lower Division	Upper Division
<ul style="list-style-type: none"><li>• Algebra 1</li><li>• Geometry</li><li>• Numbers and Operations</li><li>• Data Analysis &amp; Probability</li><li>• Problem Solving</li><li>• Pre-Calculus</li></ul>	<ul style="list-style-type: none"><li>• Algebra II</li><li>• Geometry</li><li>• Statistics</li><li>• Trigonometry</li><li>• Problem Solving</li><li>• Calculus</li></ul>

- Each category will have questions ranging in point value, increasing in difficulty
- Each team will pick a category and select a point value when it is their turn.
- Students are allowed to screenshot the question to take to their breakout rooms.
- Teams will have three (3) minutes max to answer the question. Additional time may be allotted for the more difficult questions increasing time to four (4) minutes.
- Teams will be able to provide a response. Each team will designate one representative to buzz in/raise their hand while the game is in session as well as display their team's answer.
- The representative will need to write their team's final answer in its simplest form, legibly, for facilitators to read when called upon (a thick marker may be the best utensil to use).
  - Representatives are not to display their answer until they are given notice.
  - A message will display, if necessary, that 30 seconds remain.
- If a team answers the question correctly, the team will receive the point value for that question.
- If the team answers incorrectly the point value will be deducted.
- Whichever team buzzed in second/next will be selected to control the board first and ask a question. Afterwards, each team will control the board in the order that they appear within the game.
- The game is over when time runs out or all the questions have been selected.
- The team with the highest score after the end of the game wins.
- One award for Lower and Upper Division competitions will be presented at the Pre-Torch Awards to the Lower Division and Upper Division Teams with the high scores.

# APPLICATION PROCEDURE

TMAL registration is completed via an online application through JotForm. The links for the applications can be found here: ([Lower Level](#) | [Upper Level](#)). Each team interested in participating for the 2023 -2024 program year must submit an application for the program and meet all of the team requirements.

## CRITICAL 2023 - 2024 TMAL DATES

For quick reference, the following target dates are listed to ensure your participation in the NSBE's TMAL Competition at Fall Regional Conference and Annual Convention. Please read responsibilities, events, and target timeline carefully. ALL links and resources are listed below and should be followed in the suggested order. For further information on the upcoming NSBE conferences, please visit [convention.nsbe.org](http://convention.nsbe.org).

<b>TEAM RESPONSIBILITY AND EVENTS</b>	<b>TARGET TIME FRAME (NO LATER THAN)</b>
<b>Fall Regional Conference Competitions</b>	FRC registration information will be shared separately.
<b>Performance Assessment Test (PAT)</b>	Pre-PAT results are due <b>November 6, 2023</b> . Official PAT results are due <b>February 19, 2024</b> .
<b>National Competition Quiz Bowl</b>	Register your teams for National Competition Quiz Bowl at Annual Convention <b>no later than November 19, 2023</b> <ul style="list-style-type: none"><li>• <a href="#">Lower Division</a></li><li>• <a href="#">Upper Division</a></li></ul> Competition held at NSBE's 50th Annual Convention in Atlanta, GA from March 20 - March 24, 2024.



# NSBE JR EXPLORER

## NSBE JR EXOLORER T-I-C OVERVIEW

The National Society of Black Engineers (NSBE) presents the NSBE Jr. Explorer: Technical Innovations Competition (TIC) — formerly known as the Science Fair. This program is tailored to allow pre-collegiate students the opportunity to compete and explore the many applications of science utilizing projects, competitions and science fairs. The NSBE Jr. Explorer: TIC will occur at the 50th Annual Convention in Atlanta, GA March 20 - 24, 2024.

## ELIGIBILITY

Students in grades 6 – 12 are eligible to participate in the NSBE Jr. Explorer's Technical Innovation Competition. Participants must be paid NSBE Jr. members.

The fair will be divided into two classifications:

- MIDDLE SCHOOL (JUNIOR): 6TH - 8TH GRADE STUDENTS.
- HIGH SCHOOL (SENIOR): 9TH - 12TH GRADE STUDENTS.

In terms of awards, team projects will be judged separately from individual projects.

## CRITERIA

- A chapter may have as many participants as desired.
- Each student is only allowed to enter one project. The project may include no more than 12 months of continuous research.

## ETHICS STATEMENT

Scientific fraud and misconduct are not condoned at any level of research or competition. This includes plagiarism, forgery, use or presentation of other researcher's work as one's own and fabrication of data. Fraudulent projects will fail to qualify for the competition. NSBE reserves the right to revoke recognition of a project subsequently found to be fraudulent.

# PARTICIPATION REQUIREMENTS

## TEAM REQUIREMENTS

- Teams may have a minimum of one and max of three ACTIVE chapter members.
- Teams may consist of a combination of students in grades 6 – 8 (Junior project teams) and grades 9 – 12 (Senior project teams). Junior and Senior teams (grade groups) cannot be combined.
- Teams may not substitute members in a given research year.
- Team members cannot be changed during a given research year, including converting from an individual project to a team project, or vice versa.
- Each team is encouraged to appoint a team leader to coordinate the work and act as spokes- person. It is recommended that each member of the team be able to serve as spokesperson, be fully involved with the project and be familiar with all aspects of the project. The final work should reflect the coordinated efforts of all team members and will be evaluated using similar rules and judging criteria as individual project.
- Full names of all team members must appear on the abstract, formal report, display and all required forms.
- Individual and team projects are required to be presented to a panel of judges and evaluated based on a set criteria.

## PROJECT REQUIREMENTS

The Middle and High School TIC research project options are separated into two categories.

### **CATEGORY 1: JUNIOR (MIDDLE SCHOOL) SCIENCE FAIR RESEARCH TOPICS**

Middle School Projects (6th - 8th grade) must fit within one of the three areas of science:

- Biological/Life and Earth Sciences (Botany, Ecology, Geology, etc.) - A Biological/Life Science project examines some aspect of the life or lifestyle of an organism or rocks.

Example: The Effect of Sound on Plants, Correlation of History Discovered in Rocks

- Physical Sciences (Physics, Chemistry, etc.) - A Physical Science project studies an abiotic phenomenon in order to understand the relation of identified factors, perhaps including a cause and effect relationship.

Example: Observation of Freezing Rates of Water for Different Starting Temperatures, The Environmental Impact of Global Warming

- Engineering (Electronics, Robotics, Mechanics, etc.) - An Engineering project applies physical science knowledge to solve a problem or achieve a purpose.

Example: Design Considerations for Solar-Cell Powered Homes, The Power of Programming and Electronics, Bridge Experiments & Analysis

## CATEGORY 2: SENIOR (HIGH SCHOOL) GRAND CHALLENGE RESEARCH TOPICS

The High School Projects (9th - 12th grade) will address the National Academy of Engineering (NAE) Grand Challenges. The science project can address any one of the grand challenges however the team sees fit. The team must consider the TIC scientific research requirements first and foremost.

Below are the list of the 14 Grand Challenges. Click on the link above for a description of the challenge.

Advance Personalized Learning	Secure Cyberspace
Make Solar Energy Economical	Provide Access To Clean Water
Enhance Virtual Reality	Provide Energy From Fusion
Reverse-Engineer The Brain	Prevent Nuclear Terror
Engineer Better Medicines	Manage The Nitrogen Cycle
Advance Health Informatics	Develop Carbon Sequestration Methods
Restore and Improve Urban Infrastructure	Engineer The Tools of Scientific Discovery

Certain science projects may be selected for further development, support and a pitch presentation at the 49th Annual Convention. Further details will be shared with selected teams.

## APPLICATION REQUIREMENTS

NSBE Jr. Explorer: TIC registration is completed via an online application through Jotform. The applications can be found here: ([Middle School](#) | [High School](#)).

Each team interested in participating for the 2023 - 2024 program year must submit an application for the program and meet all of the above team requirements. COMPLETED applications are **due no later than 11:59 PM on November 19, 2023.**

## COMPETITION COMPONENTS

Each individual and team is awarded a numerical score in each of the three events. At the end of the competition the total points earned is computed by the rubric listed below. The individual and team with the highest point total is the winner. There is a first and second place winner for each division (high school and middle school, team and individual) of the competition. There will also be one overall winner designated for each segment of the competition.

Event	Total Qualifying Points
Project Summary	200 (160 minimum)
Oral/Multimedia Presentation	100 (85 minimum)
Poster Display	100 (85 minimum)

In order to qualify for an award, each team must meet the minimum qualification points total in each category. No individual or team will be eligible for a prize if the minimum point totals have not been awarded by the judges. If no teams or individuals meet the minimum, awards will not be awarded in that category.

## ABSTRACT

All registered NSBE Jr. participants must submit a 500-word maximum abstract to the NSBE Professionals PCI Chair, Tracy Adams at [pebpci@nsbe.org](mailto:pebpci@nsbe.org). Abstracts must be received **no later than 11:59 PM on December 17, 2023**.

The subject line of the team email should read as follows:

- Abstract\_FirstName. LastName\_DivisionLevel
- Example: EffectsofRecycling\_John.Doe\_MiddleSchool

### GUIDNELINES FOR ABSTRACTS

An abstract is a shortened version of the main ideas of your research paper. An abstract is a one-page paper that is written after you have completed your research paper. It should be easy to read, saving time from reading the entire research paper and is used by the judges to check your research and reasoning. It must provide the necessary information to understand what the research paper and project is about. Follow these instructions when writing the abstract.

The abstract should include the following:

A. Purpose of the Experiment	C. Data
B. Procedure	D. Conclusions

It may also include any possible research applications. Only minimal reference to previous work may be included.

An abstract must not include the following:

**A. Acknowledgments (including naming the research institution and/or mentor with which you were working, or self-promotions and external endorsements**

**B. Work or procedures done by the mentor**

## RESEARCH PAPER

This is a report in which you summarize everything you have researched about the topic for your science project. The size of the font should be no larger than 12 in Times New Roman or Arial. The entire research paper should contain no more than 10 pages when you include the title page, table of contents, abstract, body of the paper (about 5 pages), pictures page and bibliography. The report will be submitted via email (pebpci@nsbe.org) by **11:59 PM on January 21, 2024**.

**No late submissions will be accepted.**

### ORDER OF REQUIRED SECTIONS

- Title Page
- Abstract
- Table of contents
- Introduction
- Materials & Methods
- Results
- Discussion
- Conclusion
- References

»» Images and charts can be integrated within the body of the research paper or included in an appendix.

# PROJECT DISPLAY & VISUAL PRESENTATION

Information must be complete, clear and logical. Color and contrast will add to the overall creativity of the display. The display must maintain an accurate experimental journal that shows all of the data observed during the experiment. Data entries should include:

- Name
- Date and time of the observation
- Accurate description of the observation
- Other observations like weather conditions, mistakes, expectation, etc.

Use your creative skills to design a display that will catch the eye of judges and other observers. Your stand alone display poster can be: 1. A three panel (to display from a table), 2. A single panel posters (to stand on an easel), or 3. These options are acceptable for the project display, including the required components listed below.

Poster display components:

- Title
- Abstract/summary
- Purpose (state what will be determined by completing your experiment)
- Hypothesis
- Materials (list everything that was used to complete the experiment)
- Methods
- Results (include all pertinent data in graphs, data table or charts)
- Tables, graphs and charts may be used to display your collected data
- Pictures, drawings and/or photographs (make sure captions and descriptions are included)
- Conclusion (write a statement that summarizes the results of your data and based on your hypothesis)
- Acknowledgements

A copy of the abstract should be maintained at the Project Display.

**Reminder: Bring a hard copy of your report to the competition site**

# ORAL PRESENTATION

Participants will be given 10 minutes to complete an oral multimedia presentation. There will also be a five minute question and answer session at the end of the presentation. During the oral presentation, participants should go through each of the major sections of the project (namely, the problem/research question, hypothesis, procedures/ methods and materials, results and the conclusion).

Participants must be ready to answer all of the judges' questions related to their project. A well-organized multimedia presentation will give the judge most of what they are looking for. However, the judges will often ask questions simply to ensure all participants understand their project fully.

## ORDER OF REQUIRED SECTIONS

Information must be complete, clear and logical. Color and contrast will add to the overall creativity of the display. The display must maintain an accurate experimental journal that shows all of the data observed during the experiment.

Presentations should include:

- Introduction
- Purpose
- Methods & Materials
- Results
- Conclusion
- Reflections and Future Work/Plans
- Acknowledgments

A student's ability to efficiently articulate their research is an important part of their presentation. Students should be aware that they are representing themselves, schools and NSBE to the public and should be dressed appropriately. Chewing gum, listening to music and cellular phones are strictly prohibited during competition. Students should be respectful of other students and judges. Grading rubrics for all parts of the competition will be shared with participants prior to the convention.

## SAFETY

The safety of our members and the public is of the utmost importance. Precautions must be taken to prevent the possibility of personal injury, property damage and the legal action that could result from a lack of concern for safety.

Exhibits must be sturdy, with moving parts firmly attached and approved for safety. Each exhibit must be self-supporting. Electricity (AC 110 volt cycle) will be supplied, if requested; however, no gas or water outlets will be provided. Switches and cords must be the approved variety, and fuses or circuit breakers must protect circuits. Cell or battery-fed circuits should be both safe in design and operation.

All sharp edges or corners on prisms, mirrors, enclosures and glass and metal plates must be removed or otherwise protected. The length of hoses or extension cords is to be kept to a minimum and out of the way to eliminate tripping hazards. Use tape for securing. Aisles and exits should not be obstructed. Moving exhibits (e.g. radio-controlled vehicles, robots) should be restricted to the regulation display space.

The Host Committee will try to provide an exhibition area to safely demonstrate projects that require more space than the regulated exhibit display space. In addition to the regulations noted here, there may be local municipal or provincial regulations, which must be followed. The Host Committee shall share any such restrictions preceding the fair.

## FIRE SAFETY

Restrictions have been defined on the construction of displays to reduce the possibility of accidental fire during the fair. The Host Committee will be responsible for ensuring that fire extinguishers of proper size and rating are available in the exhibition area, as well as evacuation guidelines in case of an emergency.

- **Combustible material must not be used near a heat source**
- **Smoking is not permitted in the exhibit area**
- **Packing material must not be stored in the exhibit hall**

## CHEMICAL SAFETY

No containers of toxic or flammable chemicals are allowed. Dangerous chemicals are not allowed-this includes prescription drugs and over-the-counter medication.

Substitutes for toxic and corrosive materials must be used. Common salt, for example, can be used to simulate chemicals such as ammonium nitrate. Water may be used instead of alcohol, ether and other highly flammable liquids. When chemicals are simulated, they should be labeled with the names of the substance they represent preceded by the word "simulated." No project will be penalized because the key (but potentially dangerous) components were not on display.

## ELECTRICAL SAFETY

Electrical exhibits shall use as low a voltage as possible. At the end of the viewing period, all electrical exhibits must be disconnected and power bars switched off. Where practical and necessary, it is recommended that pilot lights be used to indicate that the voltage is on.

Cord-connected electrical appliances should have a 3-wire conductor with ground. Electrical devices must be protectively enclosed as far as it is practical. Any enclosure must be non-combustible. All non-current carrying metal parts must be grounded. No exposed live parts over 36 volts are allowed. Current (amperage) must be low so as not to cause any discomfort or danger if touched. Wet cells shall not be used because of the hazardous chemicals involved.

## STRUCTURAL AND MECHANICAL SAFETY

Exhibits must be a safe design with adequate stability to keep from tipping. Dangerous moving parts such as belts, gears, pulleys and propeller blades must be suitably guarded. Pressurized vessels or compressed gas cylinders are not allowed.

## CRITICAL 2023 - 2024 TIC DATES

For quick reference, the following target dates are listed to ensure your participation in the NSBE Explorer Technical Innovation Competition at Annual Convention. Please read responsibilities, events, and target timeline carefully. ALL links and resources are listed below and should be followed in the suggested order. For further information on the upcoming NSBE conferences, please visit [convention.nsbe.org](http://convention.nsbe.org).

TEAM RESPONSIBILITY AND EVENTS	TARGET TIME FRAME (NO LATER THAN)
<p align="center"><b>Submit application to participate in 2023 - 2024 season</b></p>	<ul style="list-style-type: none"> <li>• Register your team/chapter to attend Annual Convention at <a href="http://convention.nsbe.org">convention.nsbe.org</a></li> <li>• Register your team to participate in TIC at Annual Convention <b>no later than Sunday, November 19, 2023.</b> <ul style="list-style-type: none"> <li>◦ Middle School <a href="#">here</a></li> <li>◦ High School <a href="#">here</a></li> </ul> </li> </ul>
<p align="center"><b>Abstract</b></p>	<p>Send abstract to <a href="mailto:pebpci@nsbe.org">pebpci@nsbe.org</a> <b>no later than Sunday, December 17, 2023.</b></p>
<p align="center"><b>Research Paper</b></p>	<p>Send research paper to <a href="mailto:pebpci@nsbe.org">pebpci@nsbe.org</a> <b>no later than Sunday, January 21, 2024.</b></p>
<p align="center"><b>NSBE Jr Explorer TIC National Poster and Oral Presentation Competition</b></p>	<p>Held at NSBE's Annual Convention in Atlanta, GA from March 20 - March 24, 2024.</p>

# PCI ANNUAL EVENTS

## FALL REGIONAL CONFERENCES

Fall Regional Conferences (FRCs) provide a forum for discussion and information exchange between pre-college, collegiate, professionals and corporate representatives at the regional level. Within the three-day weekend each region encourages academic excellence and leadership development through various technical, cultural, workshops and competitions and Career and Graduate School Fairs.

All regions will host workshops and competitions. Regional Pre-College Initiative Chairs will notify active chapters in their region about specific events taking place during FRC.

## ANNUAL CONVENTION

NSBE's Annual Convention provides inspiration, education and connections to pre-college, collegiate and professionals attendees alike. Through inspiring keynotes, innovative discussions, educational workshops, hands-on opportunities, competitions and much more, students will learn how to engage in NSBE's mission to increase the number of culturally responsible Black Engineers who excel academically, succeed professionally and positively impact the community.

## 2024 ANNUAL CONVENTION

ATLANTA, GA  
MARCH 20 - MARCH 24, 2024

To register and for more information about Annual Convention visit [convention.nsbe.org](https://convention.nsbe.org)

## NATIONAL SOCIETY OF BLACK ENGINEERS

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