

# **2023 Fannin County Fair Sumobot Challenge**

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\*\*\*\*\*Registration Deadline: September 29, 2023\*\*\*\*\*

## **Contest Entries**

- Teams must register at: <https://forms.gle/eWTFZNV6k1sUSxY8>
  - Teachers, coaches, or parents can register a team.
- **Each team member must complete the waiver documents, which must be signed by a parent, and return to [jessica.hall@ag.tamu.edu](mailto:jessica.hall@ag.tamu.edu) by the registration deadline.**
  - If a team member does not complete the required waiver documents by the deadline, the team will be disqualified.
- Cost: \$30 per team
  - Payment must be made to the Fannin County Extension Office by the registration deadline.

## **Workshops**

- If your child/team is interested in attending a workshop to prepare for the contest, please see below
  - All workshops will be located at the Fannin County Extension Office 2505 N Center St. Bonham, TX 75418
  - For the workshops you'll need: 1 robot per team and 1 computer or tablet with the LEGO Education Spike app downloaded on it. The app will not work on a phone.
    - Download the app on your computer/tablet at:  
<https://education.lego.com/en-us/downloads/spike-app/software>
  - Workshop dates:
    - Building Your Robot: August 24th 6PM
      - We will also discuss how the contest works at this workshop
    - Learning about the LEGO programming app: August 31st 6PM
    - Sumo Bot Programming: September 21st 6PM
    - Sumo Bot Programming: October 5th 6PM

## **Contest Description and information**

- Contest Date: October 14, 2023 8am
- Contest Location: Fannin County Multipurpose Complex (Fairgrounds)
  - Inside the Multipurpose building
- The Robotics Challenge is structured as a sumo-style competition.
- Teams will bring a fully assembled and programmed robot (Please attend our robotics workshops to learn programming) to compete against others in the tournament until a winner is declared. Two robots will "wrestle" in a sumo ring designed for robots. As with human

Sumo wrestling, the goal of sumo-style robotics is to gain leverage over an opponent and force it out of the ring.

- Please note, this is NOT a "battle bots" style competition. In other words, intentionally destructive robots are not allowed and will result in immediate disqualification.

### Eligibility

- This contest is open to any youth who live in and/or attend school in Fannin County and are in 3rd-12th grade
- Teams must be made of **2-3 members** in the same age division **NEW**
  - Junior: 3rd-5th grade
  - Intermediate: 6th-8th grade
  - Senior: 9th-12th grade
- Team members must be designated when registering
- Limited to the 1st 10 teams in each age division

### The Robot

- All teams must bring their own robot
- There will be no required robot; however, the recommended robot is:  
<https://education.lego.com/en-us/products/lego-education-spike-prime-set/45678>
- At check-in, the robot will be inspected by contest officials to ensure it meets the guidelines outlined in these rules.
- If the robot fails to pass the first inspection, the team will be allotted up to 10 minutes to make corrections and resubmit the robot for a second inspection.
- Failure to meet requirements after a second inspection will result in disqualification from the tournament.
- **Robot Requirements:**
  - The robot must be fully assembled at check-in using all parts. Only the parts on the robot at check-in may be used during the tournament. No additional parts may be brought in or used after check-in. This is to ensure each robot will meet weight restrictions for the duration of the tournament.
  - Teams can reconfigure their robot between matches using only the parts used on their robot presented at check-in.
  - Pieces must be in its original factory condition (not cut, bent, reshaped, etc.). Pieces cannot be glued, taped, wired or otherwise held together.
  - Only 1 EV3, NXT, Spike Prime, or Robot Inventor brick can be used in the construction and autonomous control of the robot.
  - The robot must be 100% controlled autonomously by the onboard EV3, NXT, Spike Prime, or Robot Inventor brick. No remote controls of any type allowed.
  - There is no limit to the number of sensors or motors.

- The robot can weigh up to 1.5 kilograms. There is no minimum weight. A tolerance may be given by contest officials.
- Throughout the tournament, and at the beginning of each match, the robot must be able to fit inside a 10"x10" square box **NEW**. There is no height limit. The robot may autonomously expand to any size once the round starts and the 5-second programming delay has expired (see The Program section).
- The robot must not physically separate into pieces. It must remain a single centralized robot throughout the match.
- No pieces can be purposely dropped or placed onto the playing field by the robot that might impede the mobility of its opponent. Robots may not throw anything at its opponent nor drop items onto the playing field. Any part used to purposely entangle the opponent's robot is not allowed. In the event a piece falls off during the round, the judge may elect to remove the piece if he/she deems such action will not impede the progress of the two robots; otherwise, it will remain on the playing field until the end of the round.
- The robot must possess a form of mobility and use that mobility throughout the match. Stationary robots will be deemed disabled (see Scoring).
- The robot cannot have parts or mechanisms that intentionally cause damage to its opponent. Normal pushes, lifts, and collisions are not considered intentional damage.
- No sharp edges or pointed pieces allowed. If the part could easily cause physical damage to a person, the playing field, or the opponent's robot, it is not allowed.
- After the programmed 5-second delay, the robot must move or attempt to move continuously throughout the match or it will be declared disabled; thus, losing the round.
- The robot must not have any parts or adhesives that adhere, fasten, or somehow secure the robot to the playing surface or its opponent. Sticky substances that might improve traction or grip are not allowed. Tires and other parts of the robot that will come into contact with the playing surface will be tested during inspection using an index card. The robot must not pick up and hold the card for more than 2 seconds.
- The competitor/robot must not use any device, such as jammers or using strobe lights, that may obstruct the control of the opponent robot's operation
- No powders, gasses, or liquids may be stored/used by the robot.
- Robots may be re-inspected at any time during the tournament for any reason.
- Failure to adhere to these rules may result in forfeiture of the match. A second violation will result in disqualification from the tournament as well as forfeiture of all awards and standings.

## **Robot Programming**

- To learn how to program your robot, please attend the robotics workshops at the Fannin County Extension Office - date TBA
- The robot must be pre-programmed to have a 5-second delay after pressing the start button before any physical action by the robot takes place. This delay will allow time for the contestants to back away from the ring so that robot sensors do not detect contestants.
- Every robot's program will be tested for the 5-second delay during inspection and may be re-inspected at any time during the tournament.
- Teams may use any firmware or software language for their EV3, NXT, Spike Prime, or Robot Inventor brick.
- Teams may change or update their program(s) between matches, so long as the team's robot is not currently needed in the staging area or about to compete in a match.

### **Contest Format**

- For this contest, Teams will be divided into and only compete within their age division.
- Once divided into an age division, each team will be paired against a random opponent for their first match.
- If there is an odd number of teams in the age division, some teams may or may not have a bye at some point during the tournament.
- Each team will have the opportunity to earn points in each match. A match win is worth 2 points. A bye is worth 2 points. A match draw is worth 1 point for each team. A match loss will yield 0 points. Following the first match, teams will be paired against other teams with similarly earned points. The Median-Buchholz system, Points Differential, and Wins vs. Tied Participants will be used to break ties. If a tie (within an award position) remains after all matches have been played, the tied teams will play a sudden death match until a winner is declared and the tie is broken.

### **Playing Field (Will be provided by contest; do not bring your own)**

- The platform in which robots will compete upon will have the following specifications:
  - The substructure will be constructed from MDF, plywood, plastic, or similarly rigid material. Short legs may be fastened to the bottom of the substructure to raise it off the floor.
  - The surface will be covered with a printed vinyl material, which will be adhered to the substructure.
  - Total diameter is 42"
  - Top center is white (38" in diameter) with a 2" black border (see Figure1)
  - The playing field surface will be approximately 2-4" above the arena floor.
  - Two 10"x10" starting boxes will be located 8" from the outer edges of the ring (see Figure 1).
  - Measurements may vary slightly from ring to ring and will have a tolerance of up to  $\frac{1}{2}$ ".



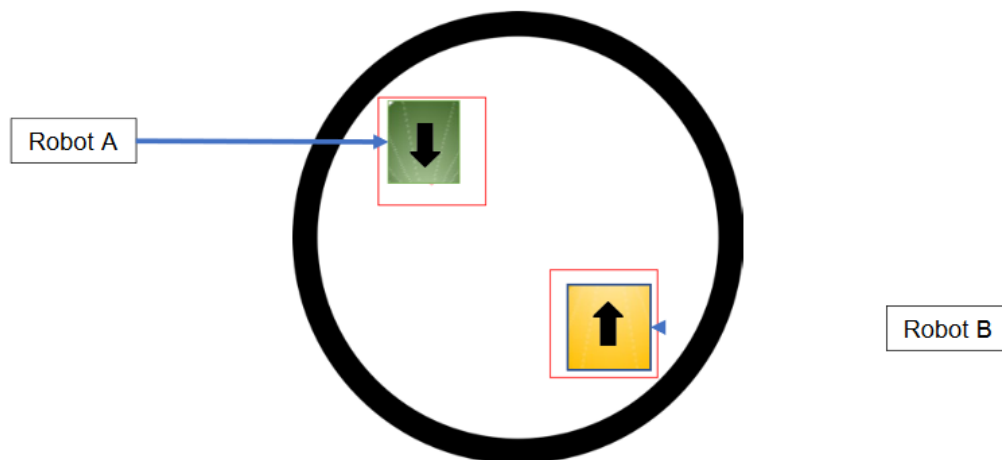
- The opposing team's robot, on its own or by force from its opponent, is the first to touch (with any part) the arena floor.
- The opposing robot becomes disabled and fails to engage for 10 or more seconds.
- An opposing team member violates a rule
- A team wins a match when it has 1 or more round wins than the other team.
- A match draw occurs when both teams have the same win-loss-draw record.
- Match Point Values
  - A win is worth 2 points
  - A bye is worth 2 points
  - A draw is worth 1 point
  - A loss is worth 0 points
- A piece or pieces of a robot that breaks off the main structure of the robot during a match and lands on the arena floor does not constitute the opponent leaving the arena.
- If both robots become entangled for 10 seconds, or if it is determined that both robots touched the arena floor at the same time, the round will be declared a draw. Entanglement is defined as engaged robots that are not making significant progress toward the edge of the arena.
- Matches will be scored by a single judge. At the end of the match, once the score card has been signed by both team captains, the results are final. **There will be NO challenging judges' decisions.**
- If a team fails to report to the staging area and/or their assigned ring when called, they will forfeit the match and not be awarded any points. In such cases, the opposing team will be awarded a match win.
- A penalty may be declared by the judge if he/she is witness to unsportsmanlike conduct by a team member or determines a rule has been violated. In such cases, 1 point will be deducted from the team in violation.

### **Team Procedure**

- When announced, teams will bring their robot (powered up and ready to compete) to the designated staging area. Teams that fail to report to the staging area will forfeit their match.
- Teams will be directed to a playing field and place their robots in one of the two starting squares.
- The team captain will place the robot in its ready position. Other team members must stay in the designated contestant spectator area. Team captains can change between matches if desired.
- Each robot must be placed completely within the 10" x 10" square with the front of the robot facing in the same direction as the arrow. (see Figure 2)
- A contest official will countdown to start the match.

- When the first round begins, the team captain will press the start button on his/her robot and then move to the designated contestant spectator area during the 5-second programming delay. At this point, the robot may not be touched by any team member until the judge announces the results of the round.
  - If there is a false start (one team pushes the button before the other), a restart will be ordered by the judge.
  - If a team false starts a second time within a round, the opposing team will be awarded a round win.
- The judge will monitor the round until it ends.
- The judge will then instruct both team captains to retrieve his/her robot and reset it for the remaining rounds.
- At the conclusion of the match (3 rounds), the judge will announce and record the match results. Both team captains will review and initial the scorecard.
- Depending on the tournament schedule, the team will either proceed to the next playing field, return to the staging area, or to the team holding area.
- **At the conclusion of all matches in each age division, each team will participate in an interview.** Interviews determine Engineering Design Champion and Sportsmanship Awards, not match awards.
  - Interview questions might include:
    - What was each team member's job in the engineering process?
    - Why did you design your robot the way you did?
    - How did you program your robot?
    - What is it about your robot that made it a better competitor than the other robots?

**Figure 2: Robot Placement Example**



### Other Contest Information

- Teams are only allowed to bring the following:
  - 1 Pre-built, pre-programmed robot (see The Robot section above)
  - 1 empty container to transport robot and/or listed store supplies in
  - Unlimited number of replacement batteries
  - Battery charger
  - 1 power strip
  - 1 laptop or tablet for programming only (no internet access will be available)
  - Electronic devices used for medical reasons are permitted.
- Teams are NOT allowed to bring the following:
  - Extra Lego parts or pieces
  - Cell phones, except for medical reasons. In such cases, please notify contest officials prior to the contest
  - Food or beverages of any sort, except for medical reasons
- Contest officials will not have, nor provide, any parts, supplies, or computers for teams to borrow/use.
- No communication will be allowed between spectators and teams during the tournament.
- No adults (including coaches) are allowed on the contest floor once the tournament begins.
- Team-to-team communication is allowed and encouraged.
- If programming or construction problems arise, teams are highly encouraged to communicate and assist one another.
- Tips for inspection:
  - Have your robot powered up and ready.
  - Be ready to demonstrate the required 5-second programming delay.
  - Make sure ALL pieces you may use during the tournament are attached to your robot at check-in.
  - Ensure your robot meets all rules outlined above.
  - Make sure all firmware is up to date prior to the tournament.

## Awards

- Overall:
  - Engineering Design Champion
  - Sportsmanship/Teamwork
- Junior:
  - Sumo Junior division champion
  - 2nd-4th Place
- Intermediate:
  - Sumo Intermediate division champions
  - 2nd-4th Place
- Senior:
  - Sumo Senior division champions



- 2nd-4th Place