

Overview of Competition

The FBISD Robotics Competition gives elementary and middle school teams a chance to build, program, and test a robot. Each team competes on the same type of game area and tries to complete tasks accurately and efficiently.

Visit the district Robotics Competition website for task release dates. Tasks are usually released in November so students can practice programming and mini-challenges before the competition.

Before the competition, teams design, build, program, and test their robots using only district-purchased LEGO Mindstorms EV3 Core Set (5003400 EV3) or LEGO Spike Prime (#45345) parts. LEGO Expansion Kit parts may not be used. Students should do the building and programming; sponsors should guide and support only.

Teams compete virtually in late March. If needed, top elementary and middle school teams may complete a second round to determine first place. Awards are announced at the STEM Showcase in late spring. Visit the district STEM Showcase website for event information.

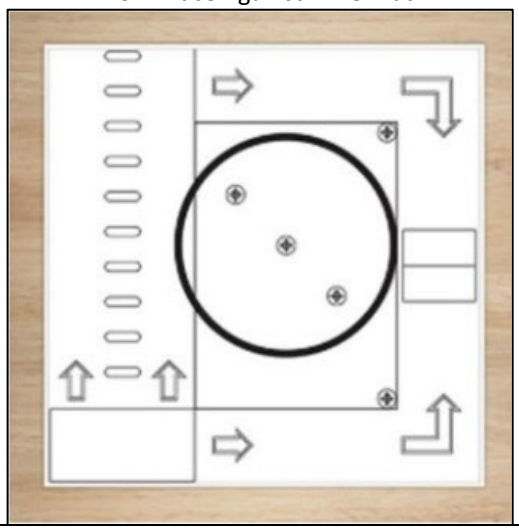
Rules

1. Teams may have up to **three** students and must have at least **one** sponsor.
2. Students may only compete on one team.
3. Each campus may send up to three district-sponsored teams. If more than three teams are interested, campuses should hold a contest to choose the top teams.
4. Only students on the competing FBISD elementary or middle school team may touch the robot and programming device. The only exception is a technical problem. Student problem-solving is part of this competition.
5. Sponsors may help teams prepare before the competition. During the competition, sponsors and non-competing students may not help in ways that affect the score, such as touching the mat, laptop, or robot; reminding students about pieces; or guiding code changes.
    - First offense: 5-point penalty
    - Second offense: 20-second time penalty
    - Third offense: possible loss of job points
6. Each team may use one district-provided LEGO Mindstorms EV3 Core Set (#5003400 EV3) or one LEGO Spike Prime kit (#45345). Spike Prime Expansion kits may not be used.
7. Teams may not melt, cut, bend, glue, solder, or change LEGO pieces or competition materials in any way.
8. Teams may not add extra items, such as tape, string, or rubber bands, to improve or change their robots.
9. Teams may not use remote controls. Robots must be programmed to run on their own.
10. Robots and mats will be inspected before the competition. If either does not follow the rules, the team has 10 minutes to fix the issue. If the issue is not fixed, the team will be disqualified. Teams that use only allowed kit parts and follow the rules should pass inspection.
11. Students will set up the mat for each event. Teams should practice and know each challenge before competing.
12. Teams may tape the mat to the floor using painter's tape, masking tape, or Scotch tape. Do not use duct tape. Tape should not cover mat markings or interfere with the robot.
13. Elementary teams may add markings only in the robot's starting area. Markings that interfere with the robot count as a reset. Other markings may be added only if required for a job, such as tape for a sensor.
14. Sponsors should arrange for a campus staff member to help judge the campus robotics event.

Arena Layout

The competition arena uses an official TCEA robotics mat and the materials listed below. Each campus team is responsible for replacing lost or damaged items. Teams may have extra materials, but only the listed amounts are needed, and all materials may not be used in every task.

TCEA Race Against Time Mat	**Materials Detail from TCEA Contest Material**

	• TCEA Mat
	• 3 checkers
	• 3 PVC couplers
	• 1 EV3 Mindstorm or Spike Prime container
	• 1 EV3 Cuboid or 1 Spike Boxes – directions may be found in Lego software
	• Lego pieces (these should come from the build kit, so students will need to plan their build accordingly to have access to these pieces.
	  ○ One 11 by 15 technic frame
	  ○ Kate and Kyle or 2 mini-figs
	• Three Ping Pong Balls (provided in past years)
	• Three wooden blocks (provided in past years)
	• 6” by 1” strips of red and yellow colored paper

The materials help every team practice and compete with the same setup. The mat will be set up for one job at a time, then cleared and reset for the next job.

Game Specific Rules

1. Teams begin with 0 points.
    - Robots earn points by completing parts of each job. Teams can still earn points even if the robot misses an item or hits an obstacle.
    - Only the final run for each job counts. If a team restarts or resets a job, points start over for that job, minus any touch penalties. Task 3 will explain its scoring difference.

2. Teams may pick up the robot during play. A 5-point touch penalty applies if the robot is picked up outside a designated handling area.
    - Teams may reset their robot up to **5 total times** across all jobs.
    - Each reset is a 5-point touch penalty.
    - After all 5 resets are used, teams must wait until the robot stops moving or goes off the mat before picking it up.
    - The robot earns points when it successfully returns to a designated area at the end of a job.
    - Teams should let the robot keep running if it can still earn enough points. Before resetting or restarting, teams should decide if another attempt is worth the lost points and time.

Scoring example:

	Run #1	Run #2 Scenario	Run #2 Scenario
Team Action	Team stops after this run.	Team restarts. Run #2 replaces the Run #1 score.	Team restarts. Run #2 replaces the Run #1 score.
Results of run	Robot completes the job for 100 points but goes off the mat once, causing a 5-point deduction.	Robot stays on the mat the entire run.	Robot goes off the mat twice after the team makes an adjustment.
Points earned	Team earns 95 points for this job.	Team earns 100 points, but the extra run may affect overall time.	Team earns 90 points because two 5-point deductions are taken. The team also loses time.

What is the difference between resetting and restarting?

- Resetting means a student stops or picks up the robot while it is running and returns it to the start area. A reset adds a 5-point penalty.
- Restarting means the robot finishes its run, returns to the designated end area, and stops without being touched. The team may then start the job again with no touch penalty, but the extra run takes more time.
- If the robot goes off the mat, stops somewhere on the mat, or must be touched before reaching the designated end area, it counts as a reset, not a restart. The 5-point touch penalty applies.
- When a team restarts, the robot begins again from the designated start area. Points for that job start over, but any reset penalties already earned still count.

Scoring Example: Restart vs. Reset		
	Reset Penalty	**Restart**
Team Action	The robot is running a 100-point job. Students see it is off course, so they pick it up and return it to the start area to save time.	The robot is running a 100-point job. Students let it finish. The robot returns to the end area and earns 50 points. The team adjusts and reruns the job, earning 100 points.
Results of run	This counts as a reset and receives a 5-point penalty.	This counts as a restart, so there is no touch penalty.
Total points earned	Robot earns 100 points on the new run, minus the 5-point reset penalty. Final score: 95 points.	Robot earns 100 points with no penalty. Extra time may affect standings or limit time for other jobs.

3. Teams have 5 minutes to complete all jobs.
    - Time starts after students set up their first job and once the robot starts moving. Time stops when a student clearly tells the judge the team is finished with all jobs.
    - Teams should announce each new job so judges know what to score.
    - If time runs out during a job, only the points earned before time expired count. Teams should think carefully before restarting so they do not lose points from an earlier run.

Scoring Example: Time Limit		
	Second Run Finishes in Time	**Time Runs Out**

Team Action	The robot earns 75 out of 100 points. The team thinks it can earn more and starts a second run.	The robot earns 75 out of 100 points. The team thinks it can earn more and starts a second run.
Results of run	The robot completes the second run in time with no errors.	Time runs out before the robot completes the run.
Total points earned	The team's final score for that job is 100 points.	Only points earned before time expires count, so the team may receive fewer than the original 75 points.

4. Tiebreaker Procedure
   - If there is a tie, tiebreakers will be used in this order: most perfect-score jobs, fewest restarts/resets, then fastest total time.

5. Students are responsible for setting up the arena mat before each event.
   - Students may remove previous-job objects and add current-job objects only after the robot stops moving.
   - If an object from a previous job is removed while the robot is moving, the team receives a touch penalty.
   - If an incorrect object is left on the mat and not touched, there is no touch penalty, even if it affects the robot. Teams must decide whether removing it is worth the penalty.

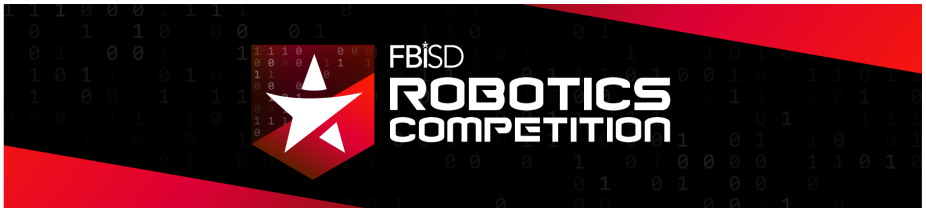
6. Robots must start each job, restart, and reset with both wheels inside the designated starting area.
   - At least one wheel must stay on the mat. If both wheels leave the mat, the team receives a point deduction.

7. At the start of the match, the robot must fit inside a 12-inch cube without being held or restrained. This means it must be no larger than 12" x 12" x 12" while at rest.
   - After the robot starts, it may open arms or move parts beyond the 12-inch size limit.
   - There is no weight limit, but the robot may only use parts from one allowed kit: LEGO Mindstorms EV3 Core Set (#5003400 EV3) or LEGO Spike Prime (#45345).

8. Robots must start each job, restart, and reset in the designated starting area.
   - While the robot is in the starting area, students may change programs, repair or rebuild the robot, and add or remove parts without a penalty.
   - The robot may start anywhere in the starting area as long as both wheels are inside the area.

9. Requests to Reset During a Job
   - Teams may request a reset at any time during the 5-minute time limit.
   - Each reset counts as a 5-point touch penalty.
   - After a reset or restart, the robot must begin the current job again from the start area and the beginning of the program. Time continues to run. Previous points do not carry over, but reset penalties still count.

10. Robots must handle small field differences, such as slight waves in the mat. When possible, teams should practice where they will compete. Store mats with the print facing out so they lay flatter when unrolled.



11. Points are totaled when the team says they are finished with all jobs or when time runs out, whichever happens first.