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High School Robotics  
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### MINEFIELD COMPETITION

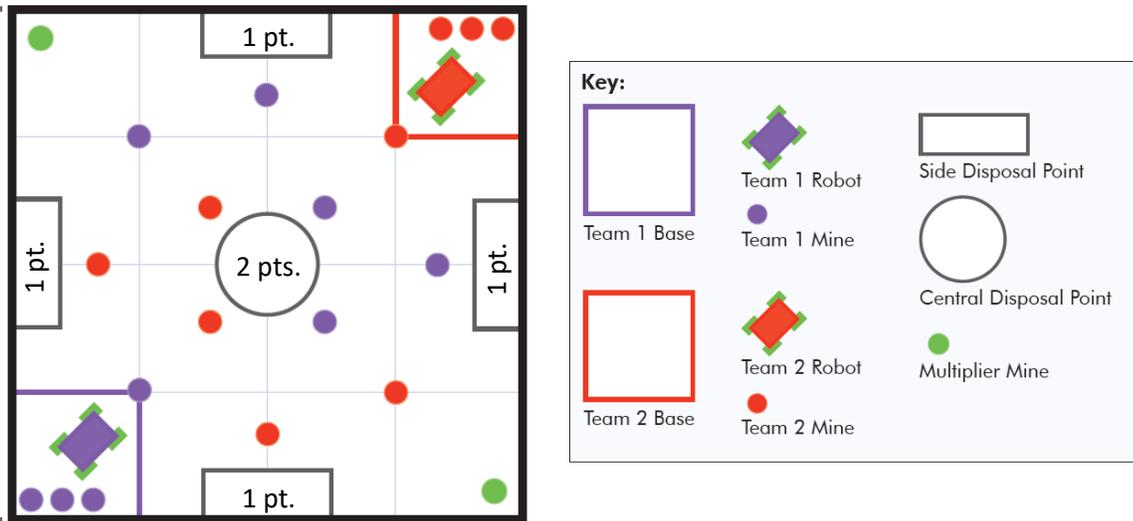
In this challenge, 14 "mines" have been placed in the game field. Two robots compete head-to-head on the field at a time. Each robot's task is to safely disarm and transport its set of mines to the disposal areas. A match lasts a total of 4 minutes, broken down into a series of 1 minute, Remote Control Periods for each driver in the team. Points are awarded based on how many mines are safely collected and disposed of at the end of each match.

#### Minefield Challenge Design Specifications

The field is an 8' by 8' solid frame with 6" high walls.

A mine consists of a ball resting atop a pedestal. Two sets of 6 mines are placed at set locations around the board, with two multiplier mines are placed at opposite corners of the field. Each team is started with three disarmed mines in base. Four small rectangular bins are centered on each side of the field, designated as disposal points.

One bin is centered on the field, serving as a higher-value disposal point.



#### General Scoring:

To score, teams remove their mines from the trigger pedestals and transport them to any of the designated disposal bins on the board. A team that knocks over a trigger pedestal with their own mine sets off that mine, and incurs a point penalty. Knocking over a pedestal with the other teams mine results in a point penalty and a timeout period. "Multiplier mines" double the point value of all mines scored the bin with the multiplier, regardless of who scored the multiplier mine.

#### Remote Control Period

A signal will be given to begin the Remote Control Period. Full use of the Remote Control will be allowed during this time. A single button press may be used to signal the start of this period on the robot, if needed.

After 4 minutes of Remote Control function, a signal will be given to mark the end of the round. All robots must come to a complete halt and accept no commands

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from the Remote Control. *Any robot moving or responding to commands during this break will be disqualified from the round.* Once the robot stops, the field will be evaluated by teacher to determine the number of points earned during the Remote Control Period.

### **Remote Control Period Scoring**

The following point values will apply to any actions completed during the Remote Control Period:

• Mine disarmed:	+ 5 points each
• Mines properly disposed of:	+15 points each
• Pedestals with mines knocked over:	- 10 points each
• Pedestals without mines knocked over:	- 5 points each
• Knocking over opponents mines:	- 10 points each, 30 second timeout

All scoring is determined based on the state of the board at the end of the round. Mines in the robot's possession (but not in a disposal bin) are worth no points. The multiplier mines may be scored by either team. Regardless of which team disarmed the multiplier mine, the point value of each mine in a disposal bin is doubled. *Knocking over multiplier mine will result in a loss of 10 points, with no timeout period.*

### **Additional Notes and Rules:**

- No movement by the robots (even accidental) is allowed prior to the start of the match. Once on the field, any movement other than the "startup twitch" will result in the offending robot being disqualified for the round.
- Any physical contact between a human and the robot once the round has started will result in a 10 point "touching penalty" being assessed against the human's team. This includes touching the robot to turn it on after the starting signal.
- "Chain reaction" point loss may occur if a knocked-over pedestal or mine causes other pedestals to fall over.
- When a measurement dispute occurs, "on top of the line" will count in the team's favor.
- Multiplier Mines double the amount of points each mine is worth in that particular container.
- Time permitting, every team will be allowed to run their robot in as many qualifying matches as possible, head-to-head with each robot in the class, and in at least 1 playoff round with the ability to make changes between every round.
- Once a mine is knocked over, that mine may still be dropped off to a disposal point and scored, if the robot has the mechanical ability to do so.
- Be respectful of your opponent. Robot bullying and unfair play (as determined by the teacher) can result in disqualification.

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### Minefield Challenge General Game Rules

<G1> All teams must adhere to all basic and specific Robotics Competition Rules as they are written, and must abide by the stated intent of the rules. Every team has the opportunity to ask for official rules interpretations. There may also be periodic "Rule Updates" given to the class as rules are questioned and interpreted. These updates are also "official" parts of the rules.

<G2> all teams are expected to conduct themselves in a respectful and professional manner while competing in Robotics Competitions. If a team or any of its members are disrespectful or uncivil to the teacher, class visitors, or fellow competitors, they will be disqualified from a current or upcoming Match. It is important to remember that we are all judged based on how we deal with adversity. Every team will have its successes and failures. It is important that we all exhibit maturity and class when dealing with any difficult situations that may present themselves in both Robotics Competition and our lives in general.

<G3> Teams are responsible for the construction and stability of their robot, including the cortex, VEX keys, wires, joystick, and batteries. When a team places their robot into the starting point of a match, they are ensuring that all nuts and screws are tightened, and everything is secured.

<G4> Teams are also responsible for the communication of their keys and charge of all of their batteries. Teams are responsible to check the condition of all of these and make sure they are up to date/ charged prior to the start of a match. If a robot comes apart, VEX keys stop communicating, or the batteries in the joystick or on the battery die, the match will continue on.

<G5> When reading and applying the various rules in this document, please remember that *common sense always applies* in the robotics competition. The teacher has final discretion over all rule interpretations and enforcement.

<G6> At the beginning of a Match, each Robot must be smaller than a volume of **18 inches wide by 18 inches long by 18 inches tall** for all in class competitions, qualifiers, and activities. An offending Robot will be penalized or removed from the competition at the teacher's discretion.

<G7> Each team shall include a certain number of Drive Team Members. No Drive Team Member may fulfill this role for more than one team at any given event.

<G8> Only Student Drive Team Members may touch the team's controls at any time during a Match, and are the only Drive Team Members allowed to interact with the Robot. Minor violations of this rule that do not affect the match will result in a warning. Teams that receive multiple warnings may also receive a Disqualification at the teacher's discretion. Egregious (match affecting) offenses will result in a Disqualification.

<G9> During a Match, the Drive Team Members must remain in their designated Alliance Station.

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<G10> Robots must be placed on the field promptly. The red alliance has the right to place its Robots on the field last. During the elimination rounds, the higher seeded Alliance has the right to place its Robots on the field last. Once a team has placed its Robot on the field, its position cannot be re-adjusted prior to the match. A Team that violates this rule will have its robots randomly repositioned by the teacher.

<G11> Drive Team Members are prohibited from making *intentional contact* with any Scoring Object, Field Element or Robot during a Match, with the exception of the contact specified in game play and when protecting themselves. Disqualification at the teacher's discretion. Drive Team Members are not permitted to break the plane of field perimeter at any time during the match.

<G12> During a Match, Robots may be operated only by the Student Drive Team Members.

<G13> It is understood that Scoring Objects may unintentionally leave the field during match play. Objects that leave the playing field will be promptly returned to the playing field in approximately the same location from which they exited the field. Teams may not intentionally remove Scoring Objects from the field, while not in the process of Scoring/Building or removing Scored/Built Objects. Scoring Objects are expected to leave the field accidentally during Scoring/Building, however doing so intentionally or repeatedly would be a violation of this rule. Disqualification at the teacher's discretion. Note: Scoring Objects will never be returned to the playing field in a Scored/Built position.

<G14> Scores will be calculated for all Matches immediately after the Match after all objects on the field come to rest. No student may enter the field or touch any Scoring Objects until the teacher has indicated that it is alright to do so.

<G15> Robots may not intentionally detach parts during any Match, or leave mechanisms on the field. Disqualification at the teacher's discretion. Multiple intentional infractions may result in Disqualification for the entire competition.

<G16> Strategies aimed solely at the destruction, damage, tipping over, or Entanglement of Robots are not part of the spirit of Robotics Class or Competitions and are not allowed. However, some incidental tipping, entanglement, and damage may occur as a part of normal game play. If the tipping, entanglement, or damage is ruled to be intentional or egregious, the offending team may be disqualified from that Match. Repeated offenses could result in a team being disqualified from the remainder of the competition.

<G17> Robots must be designed to permit easy removal of Scoring Objects from any grasping mechanism without requiring the Robot to have power after a Match.

<G18> Field tolerances may vary by as much as  $\pm 1''$ , except where otherwise noted, so teams must design Robots accordingly. Please make sure to check the assembled field during Practice Time for exact layout and measurements.

<G19> Replays are at the discretion of the teacher, and will *only* be issued in the most extreme circumstances.