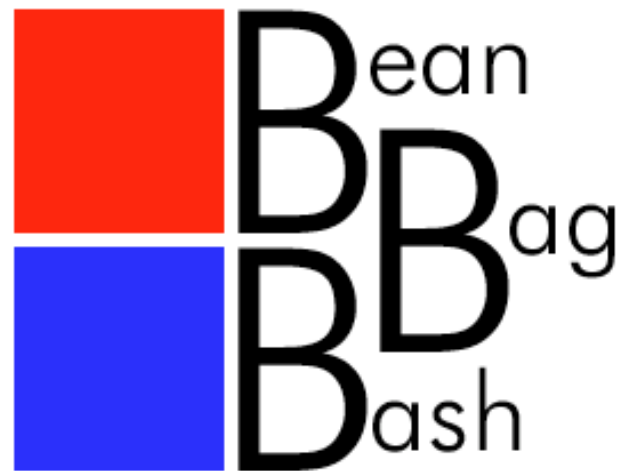


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PRESENT



**2007 Mentor VEX Challenge**  
**September 29**  
**(Field TBA)**

# **Bean Bag Bash**

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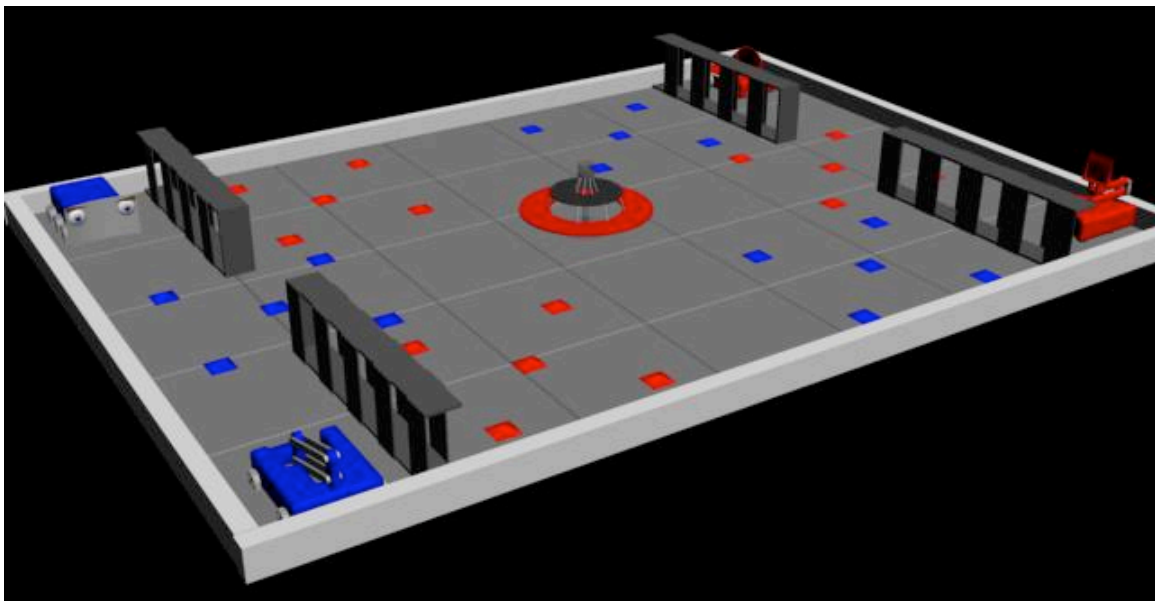
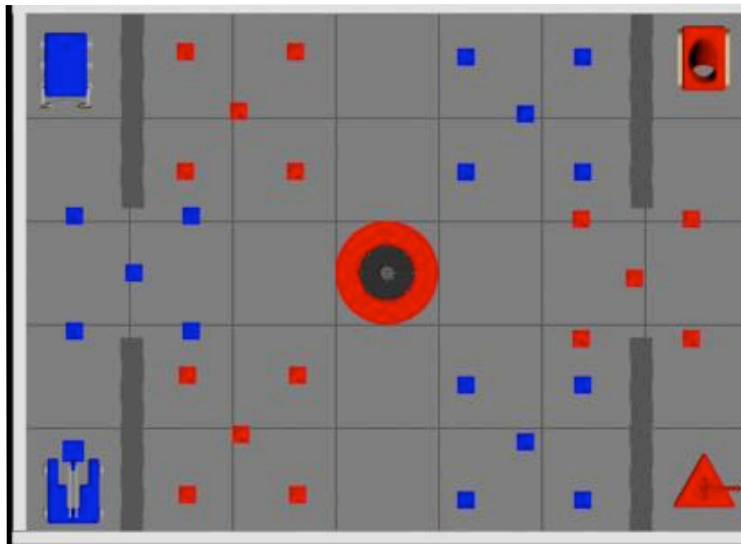
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## 1. Objective:

The point of the game!!!!!!

The Object of the game is to place beanbags on the multi-tiered tower and cap the tower with your teams ball and have the highest score at the end of the match.

## 2. The Field



## 2.1 Field Description

2.1.1 The playing field is the official Milwaukee Vex League Field from 2006 and is constructed of PVC pipes and fittings. The field measures by 10' x 14' and the surface of the playing area consists of 2' x 2' interlocking dark gray foam floor interlocking tiles available from [www.softies.com](http://www.softies.com).

2.1.2 All official field dimensions will be within +/- 1/2" tolerance

## 2.2 Game Elements

2.2.1. Scoring Area: The center of the field is occupied by a scoring tower that consists of two scoring tiers and one central cup at the top.

2.2.2 End Zones: The fields consist of two end zones on opposing sides of the field. Each end zone measures 22" away from the alliance wall and stretches the width of the field. The end zones are enclosed by 12" tall 1/4 inch thick black expanded PVC foam boxes. These boxes have a width of 5" and a length of 40". The boxes are placed on each end of the field 22 inches from the back border and flush against the left and right sides, leaving an opening of approximately 40 inches between them.

2.2.3 Starting Zone: The starting zones are 22" squares in the four corners of the field in the end zones. The robots must start in these zones and these zones are the only place the human player can touch the robot or hand field objects to it.

## 2.3 Game Pieces

2.3.1 Bean Bags: The field will contain a total of 40 colored beanbags. 30 of these beanbags will be placed in groups of five in various areas of the field. One group will be placed on both sides of the field in front of the opposing WALL. An alliance scores with these beanbags by placing their colored beanbags on a tier of the tower. Each alliance will be given five of their beanbags. The beanbags are measured 4" by 4"

2.3.2 The Ball: Each Alliance begins the match with a five-inch diameter ball colored to their alliance. This ball can be thrown out of the field or

handed to the robot via the starting zone and is to be placed at the top of the tiered tower giving that alliance control of the tower. The ball is to be used as a scoring multiplier by being placed in the cup at the top of the tiered tower. The diameter of each ball is approximately 4". The ball begins in the possession of the human player and may be thrown on to the field or given to the robot in the starting zone. By doing this, alliances will multiply all beanbags placed on a tier by two (2).

### 3. Scoring

3.1 Official scoring: To be determined at the end of the match. However during the match there will be real time scoring. This scoring is unofficial and is only to serve as a strategic aid to alliances.

#### 3.2 Field Elements

3.2.1 The tiered tower: The tiered tower is positioned in the center of the field, which is 84" from the ends of the field and 60" from the sides to the center. The tower will be 10" tall from the ground to the top of the cup. There is a space of 48" between the wall of the field and Tier One.

3.2.1.1 Tier One: Tier one is the lower most tier to the ground and all beanbags placed on the platform are worth 2 points. The first tier is 2" from the ground, and attached with chain 3" below tier two. The radius is 12" from the center and the width of the doughnut is approximately 5".

3.2.1.2 Tier Two: Tier two is the second tier from the bottom and all beanbags placed on the platform are worth four points. Tier two is 3" above tier one, and attached with chain 3" below the cup. The radius is 6.5" and the width of the doughnut is 5 inches.

3.2.1.3 The Cup: At the top of the tiered tower is a cup that is mounted on a pole. This cup is the object from which all the tiers are hanging on chain. The cup is used as a multiplier for alliances. At the end of the match, whichever alliance's ball is in the cup will receive a 2 times multiplier for all beanbags scored on the rack. The cup is 3" above tier 2, it has a diameter of 3", and a height of 2".

3.2.2 Home Zones: Finishing the Match in the Home zone of your alliance is awarded with a 5-point bonus.

3.3 Bonus Points: Robots may gain a 10-point bonus by finishing the match resting on something other than their normal mode of transportation. This means the robot must not be on their wheels, treads, or other means of transportation.

## 4. Matches

### 4.1 Field Crew

A field crew team consists of three members: One driver, one human player, and one coach.

4.1.1 Driver: the driver is the only person who may touch the controls of the robot. The driver may not touch any game piece.

4.1.2 Coach: the coach cannot touch the controls but may touch any game piece; they cannot interact with the robot in any way. (Optional position)

4.1.3 Human Player: The Human Player is the only person who may interact with the robot. This includes being able to fix the robot without the aid of any tools. However this action will result in a 30-point penalty.

4.2 Match Safety: Safety glasses are a required at all times during the matches to ensure the maximum possible eye protection. Safety glasses are also required at all times in the pit area and on the competition field. Teams will not be permitted to compete unless all team members on the competition field are wearing safety glasses. Teams must provide their own safety glasses for the event; no safety glasses will be supplied by the event coordinators.

4.3 Match Setup: The robots must be setup with the following considerations.

4.3.1 The robot must start the match completely in the starting zone, which means the robot cannot be on the line.

4.3.2 The robot must be touching the wall in at least one point.

4.3.3 Once all the teams give the okay signal the field judge at that corner will take note as to what is considered to be their drive system. This will be

the definition of the drive system for the remainder of the match and will be used in the awarding of the bonus points at the end.

4.4 Match Types: The competition will consist of Qualifying Matches followed by Elimination Matches. Each match is 2 minutes and 30 seconds long. There is no autonomous period and the robot will remain under the control of one individual for the duration of the match.

#### 4.4.1 Qualifying Matches

4.4.1.1 All teams will play in approximately the same number of Qualifying Matches (the number of matches will differ by no more than one match). Teams will be paired with random alliance partners for each Qualifying Match. The number of Qualifying Matches at each event will be determined by the length of the event and the number of teams competing. Teams playing in extra matches will be deemed surrogate teams and the results of that extra match will not affect their ranking.

4.4.1.2 Teams will be given their schedule of Qualification Matches before the start of the first match. The Qualification Match schedule will show the match number, the alliances competing in each match, and the color that each alliance is assigned for that match.

4.4.1.3 At the end of each Qualifying Match, the total number of points scored by each alliance will be considered their Qualification Points.

4.4.2 Elimination Matches: Elimination matches are to be run the same as the qualification matches.

4.4.2.1 During elimination matches, the #1 ranked alliance will play the lowest ranked alliance entering the elimination matches (i.e. if there are 4 alliances in the elimination matches, #1 will play #4, and the #2 ranked team will play the second-lowest ranked team, and so on.)

4.4.2.2 The number of teams participating in elimination matches will be at most 8 but may be increased or decreased prior to the start of the event based on the number of teams participating.

4.4.2.3 Alliance selection procedure for the elimination matches will be run like FRC elimination alliance selection, in which the 1st place team will pick

first and the 4th place ranked team will pick last. If a team ranking in the top 4 places is picked, then the next seeded team will pick.

#### 4.5 Ranking

At the end of the qualifying matches, teams will be ranked from 1 to N (N being the total number of teams present) based on the following:

Most wins

Total number of Qualification Points

Most matches with robot off drive base at the end of the match

Most matches with alliance's ball topping the tower

Coin toss

#### 5. General Rules

5.1 Disqualification: Robots may be disqualified based on their actions that violate the rules of the game. If a referee calls for a disqualification during a match, the robot will be disabled and they will receive a score of 0 for the match. If disqualification is not determined until the completion of the match, the offending robot will receive a score of 0 for the match. The alliance partner of a disqualified robot will still receive the score earned by both robots for their duration in the match, provided that they are also not disqualified. In both situations the opposing alliance will receive a score based on the points that they earned.

#### 5.2 Safety Hazards:

5.2.1 Referees may request that teams alter any portion of their robot that is considered a safety hazard. It is the right of the referees to prevent teams from playing in matches until such changes are made to the robot.

5.2.2 Referees will disqualify any robot that they deem to be a repeat safety hazard. A safety hazard is any direct action of, or mechanical failure on said robot that may increase the possibility of immediate damage to other robots, field objects, or personnel.

5.3 Loss of Parts: All parts of the robot must remain attached to the robot for the duration of the match and must not cause any hazard of entanglement to

any other robot. The robot's team that causes the loss of parts may run the risk of disqualification. Minor pieces that unintentionally become detached from the robot and do not affect the outcome of the match will not cause a disqualification.

5.4 Pinning: Pinning occurs when an opposing robot is held against an obstacle and cannot move, in any direction, because of your robot's presence. Pinning will be visibly counted out by the closest referee, for a duration of five (5) seconds. If a robot is being pinned for five seconds, the team doing the pinning must back off for at least five seconds before they can resume. Failure to do so will result in the disqualification of the aggressor.

5.5 Flipping: Robots may not intentionally flip an opposing team's robot. The flipping robot will be penalized 15 points from the match score if in the referee's decision they initiated a lifting action that results in flipping. In incidents where the flipped robot initiates action or both robots are in motion, penalization may not occur and will be at the discretion of the referees.

5.5.1 Robots that are flipped by an opposing robot will receive points for being off their drive train and in their home zone, regardless of location.

5.5.2 A penalty will not be given to robots that flipped by their own alliance member.

5.6 Intent to Destroy: Strategies aimed solely at the destruction of or damage to an opponent's robot or the field is not in the spirit of the competition and will not be allowed. It is up to the referee to give a warning or disqualify the robot from the match.

5.7 Human Player Actions: Human Player's actions will be closely monitored during the match, and the following actions will result in penalty:

5.7.1 Throwing beanbags: Human Players will not be allowed to throw beanbags at robots, opponents, or field crews. Any Human Player caught doing so will be removed from the field for the remainder of the match.

5.7.2 Bean Bag Retrieval: If a Human Player removes a bean bag from the Human Player Goal Box while an alliance robot occupies the Goal Box, then

the Human Player will be removed from the field for the remainder of the match.

5.7.3 Robot Interaction: A team may not touch any robot during play. The only time a team may touch their robot is if it's in the starting zone, but they will be given a 30-point penalty. Referees will signal all teams when it is okay to pick up their robots and proceed to the pit area.

5.8 Starting Area: At the start of the match, teams may place their robot anywhere inside the designated robot start area corresponding to their team color. The starting area is defined by the outer boundary of the tape. Alliances must make a joint decision as to which alliance-colored starting area their robots will be placed in before each match.

5.9 Scoring Objects: Any scoring object that leaves the playing area during a match will not be returned to the field and is ineligible to be scored.

5.10 Robot Control: Team members may interact with their robot during a match only through the normal operation of the VEX control system. Only designated drivers may be in contact with the controls during the match.

5.11 Robot Modification: Teams are allowed to modify their robots in between matches as long as the robot remains compliant with all specifications and rules after the modification. Any modification should be brought to the attention of the referees or head inspector prior to the start of the team's next match. Teams may be subject to re-inspection at the discretion of the referees/head inspector.

5.12 Robot Identification: Teams must have their team number clearly marked on four sides of their robot. The numerals should be at least 2" high for easy visibility. Teams must also have the ability to designate either Blue or Red alliances with a color insert or flag. These inserts must be provided by the team and must not be a functional part of the robot.

5.13 Rule Clarification: All questions or requests for rule clarifications should be submitted to [mentor.vex.qa@gmail.com](mailto:mentor.vex.qa@gmail.com)

5.14 Referee Rulings: All referee decisions regarding rules of play and scoring are final. If there are any questions the head referee will make the final decision

## 6. The Robot

6.1 Size Restriction: At the start of each match, every part of the robot must fit, unconstrained, in a stable position, within a cube with 15” sides. Robots will be measured before the beginning of qualification and elimination matches.

6.2 Weight Restriction: There is no restriction on the robot’s weight, and it will not be measured at the competition.

6.3 Controls: Teams will be required to use one (1) VEX competition remote control. Frequency modules will be provided by the competition coordinators and are not allowed to be brought to the competition site. Each team’s remote is required to be tethered to a field disable tether during matches.

6.4 Pit Operation: Teams must bring a tether for robot control in the pit area. Robots may not be operated outside of the competition field or pit area. Failure to follow this rule may result in forfeiture of the next round of competition.

### 6.5 Construction Restrictions:

6.5.1 A robot must be designed to operate by reacting only against features within the confines of the playing field boundaries and may not interact with anything outside the boundaries of the playing field.

6.5.2 Gaining traction by use of adhesives or by abrading or breaking the surface of the playing field is not allowed and will be considered to be damaging the playing field and is subject to disqualification.

6.5.3 A robot may not intentionally contaminate the playing field or an opponent’s robot with lubricants or other debris.

6.5.4 Each team will be expected to use parts only from the VEX Robotics Design System Starter Kit unless specified on the additional materials list below. Teams may use 7.2V NiCd batteries of any manufacture, but only one battery (six cells) may be used on the robot at a time. The battery cost does not count towards the cost limit listed below.

6.5.5 Modifications are permitted to the mechanical parts of the kit. Teams may opt to buy their own replacement or spare parts from [www.vexlabs.com](http://www.vexlabs.com), but these may not be used as part of the robot until the part fails. Teams may NOT intentionally modify any of the kit electronics. Modification of items on the additional materials list is also permitted.

6.5.6 A parts outline form the VEX Robotics Design System Starter Kit can be found at <http://www.vexlabs.com/vex-robotics-design-system-2.shtml>

6.6 Materials: Teams are restricted to the contents of one (1) VEX Robotics Design System Starter Kits. Additional materials may be used as outlined below. Each team must submit a Bill of Materials outlining their parts and expenses before their first match. We ask that the Bill of Materials distinguish between starter kit materials and additional materials.

#### 6.7 Additional Materials List

- Any length of string of no more than 1/4" in diameter.

- Any length of rubber bands of no more than 1" in width

- Non-functional decorations

- A maximum of \$100 in additional VEX accessories from Innovation First ([www.vexlabs.com](http://www.vexlabs.com)).

6.8 Energy Sources: The energy used by the devices in the competition must come solely from:

- A change in altitude of the center of gravity of the device

- Electrical energy delivered by the battery to the electronics and motors provided with the kit.