

BunnyBot 2010 Rules

Version 1.1 10/21/10

The BunnyBot Scrimmage is an annual pre-season event designed by Catlin Gabel School Team 1540, the Flaming Chickens. Its purpose is to give new members of FRC teams a chance to get familiar with robot construction before the build season starts. This game is more relaxed than the FRC competitions and all in good fun.

WHO'S INVITED

Team 1540 hosts a competition for Northwest teams. This is, however, designed to be an easy event to stage so teams in other regions are more than welcome to host one of their own. Let Dale Yocum dale@yocum.com of team 1540 know if you are interested in doing this so we can share logistical details.

HOW TO SIGN UP

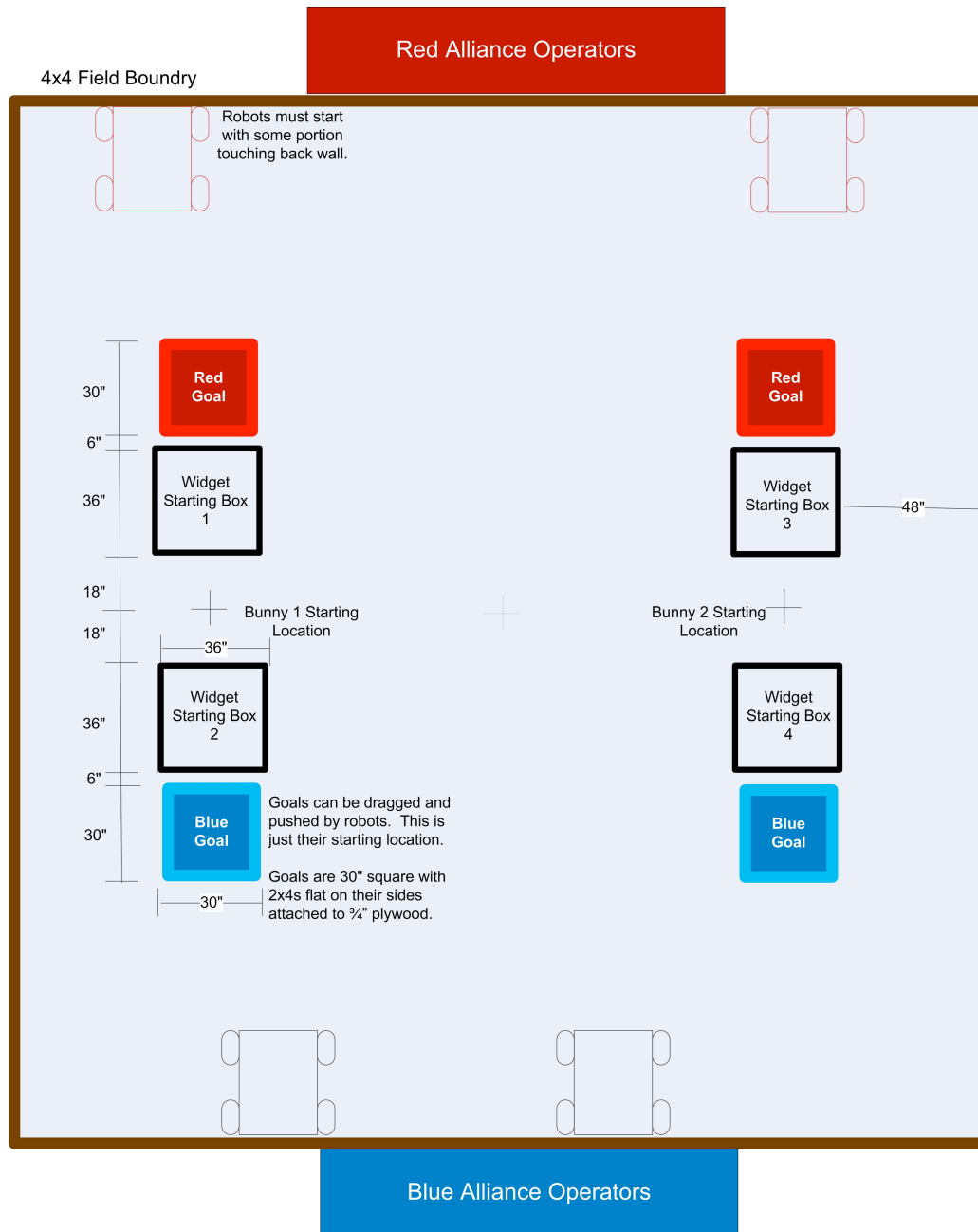
We're requesting a \$75 per robot donation to help cover expenses. We'll wave the fee for teams who can't afford it. To register, send an email to Dale Yocum (dale@yocum.com) to reserve your space indicating how many robots you'll be bringing and your team number. Space is limited so it's first come first served. Your space is not held until registration fees have been received or waved.

Send registration fees, payable to Catlin Gabel, to:

Dale Yocum
Catlin Gabel School
8825 SW Barnes Rd.
Portland, OR 97225

GAME RULES

The 2010 BunnyBot scrimmage is played on half of a FRC field, 28' x 30' carpeted with typical FRC carpet. The layout is shown below:



THE GAME

Referring to the previous diagram. Two robots form an alliance. The object of the game is for an alliance to gather a higher number of points by piling scoring objects, “Widgets” and “Bunnies”, on either of the alliance’s two goals. Bunnies score two points, Widgets score one.

GOALS

1. Each alliance has two goals. The goal’s outside dimension is 30” square and made of $\frac{3}{4}$ ” plywood edged with 2x4’s laid flat and attached on all four sides with the plywood on the bottom. Basically you are making open topped boxes with sides formed by the 2x4s. These are painted blue or red for each alliance as shown on the preceding diagram.
2. Goals are not attached to the carpet and thus can be dragged around the field by robots.
3. Robots may not intentionally cause any portion of the goal to lose contact with the field. In other words, robots can’t dump the Widgets off an opposing alliances goal by tipping it over. Robots who do this intentionally will forfeit the match to the opposing alliance.

WIDGETS

1. Each team brings five scoring objects of their own choice and design called “Widgets”. One of these is placed in each of the four widget starting boxes on the course and one preloaded on each robot (or just sitting on top of it). Hence a match will have 20 total widgets in play. The starting boxes are defined by duct tape on the carpet.
2. Any robot can score with any Widget.
3. Teams can build as many Widgets as they like and bring them to the competition. They can only bring five widgets to the field for a given match, however. Teams must decide what widgets to bring to the field before their match setup time begins. Last minute substitutions of widgets are not allowed.
4. A team’s Widgets in a given match need not all be matching.
5. Constraints on Widgets:
 - a. Must not exceed 18” in height, width and length. In order words it should fit within an 18” cube **at the beginning of the match.**
 - b. Must be at least 1” in height, width and length **at the beginning of the match.**
 - c. Widgets may not be pyramid shape.

- d. Must weigh at least .1 lbs and cannot exceed 10lbs.
 - e. May not contain a battery.
 - f. Can not contain liquid.
 - g. Hazardous materials are not allowed in Widgets. Lead, gas compressed over 30psi, gun powder, and plutonium are things that should not be found in Widgets.
 - h. A Widget must remain in one piece. You can't design, for example, a 10 lb widget that when dropped on the goal, falls apart into 10 one pound widgets. Widgets that accidentally fall apart will be counted as the single widget that they are, unless some portion touches the carpet, see "Game Details".
 - i. Avoid materials that will tend to break apart with the abuse they are expected to receive. For example, don't make Widgets out of styrofoam, wall board, glass, or cookie dough.
 - j. Widgets must not resemble a Bunny (stuffed animal) or a Spoiler to avoid confusion.
 - k. Note that electromagnets are not allowed under Robot Rules.
6. A robot can have no more than two Widgets in its possession at a time. A Widget is in the possession of a robot if it moves when the robot moves in all directions. For example, a simple bulldozer would not be in possession of a widget because the widget doesn't move with the robot when it backs up. Conversely, a robot that puts a box on top of a widget and pushes it around would be in possession. If the robot has lifted a widget off the ground, it is in possession of it. Possession rules do not apply to Spoilers or Bunnies.
7. Widgets will be inspected before play begins for the day. Refs and other teams can call for re-inspection of widgets over the course of the day as they see fit. Referees can also disqualify a widget on the spot if it clearly doesn't meet the above criteria.

BUNNIES

It wouldn't be BunnyBots without Bunnies! There are two Bunnies on the field at the beginning of the match as indicated on the preceding diagram. Bunnies are just super Widgets and are scored in the same manner as a Widget but are worth 2 points each. The Bunnies are stuffed animals 12-18" high with a rough diameter of 8". Robots intending to score with these should be able to handle a wide range of stuffed animals.

SPOILERS

1. Spoilers are 8.5" by 11" pieces of laminated 65Lb cover stock. These are heat laminated inside 5 mil pouches. If you must know, the exact paper is Wausau Astrobrights Red. Office Depot # 21758. They can typically laminate it for you too.
2. If, at the end of the match, a spoiler is placed on a goal or its widgets none of the scoring objects in that goal are counted.
3. Each alliance is given one spoiler at the beginning of the match. They can introduce this piece into play at any time during or before the match by placing or throwing it on the field. It may not be in contact with the robot when it's introduced. Before the robot can come into contact with a spoiler it must have come to rest flat on the course's carpet. In deploying the Spoiler, you may not step onto the course. If you are introducing it after play has begun, the spoiler must be introduced from anywhere along the deploying alliances end of the field.
4. In order to be valid the spoiler, like other scoring objects, must not be touching the carpet or area outside of the course nor can it be resting on an invalid scoring object.
5. Like all other game pieces, spoilers are not alliance specific. In other words, the opposing alliance can steal your spoiler.
6. No pieces or widgets may be attached to a spoiler at the time of its deployment.

ROBOT STARTING LOCATIONS

Robots may start the match anywhere they like as long as some portion of the robot is touching the 4x4 wall nearest the operators.

GAME DETAILS

1. To be counted, a scoring object must be entirely supported by an alliance's goal (or other valid widgets/bunnies in the goal) and thus may not be in contact with the carpet. It doesn't matter whether the scoring object is in contact with the plywood or the 2x4s of the goal, or the 4x4 border of the field, so long as it's not touching the carpet or surface of the arena outside of the carpet. For objects piled on top of other scoring objects in the goal, what matters is that the piled scoring object is supported by a valid scoring object. If a scoring object is partially outside of the goal and in contact with the carpet, any objects ***even partially*** supported it are also not counted.

2. The only state that matters is the condition of the field at the end of the match. For example, it's quite possible that a scoring object might start out being completely on the goal but over the course of the match ends up getting knocked in such a way as to be partially in contact with the carpet at the end and hence no longer valid. That end state is what matters, not the fact that it used to be okay.
3. Robots can remove scoring objects from a goal.
4. Any team can play with any scoring object on the field, including opposing alliance widgets. It's expected that robots will steal Widgets, Bunnies from the opposing alliance goals.
5. Matches are 2.5 minutes long.

PENALTIES AND DISQUALIFICATIONS

1. A 5 point penalty is assessed for a robot that goes out of bounds (over the 4x4s). You are considered out of bounds if any portion of your robot touches the floor beyond the 4x4s. Once a robot is out of bounds, it is disabled, manually returned to the playing field, and re-enabled.
2. Robots may not clamp or attach themselves or other devices to the goals. Robots doing this will be disqualified. Robots can push or drag goals around the field; they just can't attach themselves to it. One test for this-- if a ref were to pick up a robot and the goal starts to come with it, the robot is attached to the goal and would not be allowed.
3. BunnyBots is a contact sport and robots should be built to withstand significant pushing and shoving. A 5 point penalty will be assessed for intentionally ramming another robot at high speed, however.
4. Robots who intentionally cause some portion of a goal to lose contact with the carpet by more than .5 inches will forfeit the match. In other words, don't tip the goals!
5. Teams may not intentionally damage another robot or engage in unsportsmanlike behavior. Penalties for this kind of thing are up the referees and can range from a warning to point penalties to disqualification and match forfeiture.
6. Teams should keep in mind that spectators will be standing close of the field. Robots employing strategies that might harm people will be disqualified.

QUEUES

Robots will fill positions on the field in the order they have registered at the game master desk. Teams may only add themselves to the list at end of the queue or remove themselves from the queue because

they aren't ready (and then add themselves to the end when they are). A computer will assign robots from the top robots in the queue to alliances taking into account their qualification points, frequency of playing with particular robots, etc. It will try to avoid situations where the same robots are playing with and against the same teams another time after time and seek to create balanced matches.

If a robot isn't ready when called, that spot will go to the next robot in sequence and your robot will be removed from the queue. It is therefore in a team's best interest to have a reliable robot so you are never displaced from your position in the queue. The more matches you play, the higher your potential score. You are on your honor that when your robot is placed on the field, you have every reason to think it works! We won't intentionally run matches with dead robots ... those will be swapped out for the next robot in the queue.

Each robot will have a pit area within about 100' of the arena. We will have an on-deck waiting area. You must be ready to go when you are called or else you'll forfeit your place in the queue.

The field staff has the option to play one on one matches if there are no other robots ready to play.

RANKING AND FINAL MATCHES

After playing a match teams earn qualification points using the same formula as the 2010 FRC game Breakaway. To summarize, a team's qualification points after a match are

Winner Qualification Points = $5 + W + (2 * L)$

Loser Qualification Points = W

Tie Qualification Points = $2 * W$

Where W is the winner's score (or either robot's score in a tie), L is the loser's score.

At 3:45pm, the two robots with the highest qualification points are the alliance captains for the finale. They choose one robot each to play with them in the final matches. The team with the most points picks first. Those alliances play best two out of three matches. If a robot becomes disabled, the remaining team can choose a replacement from the robots remaining to join their alliance.

ROBOT RULES

All FRC robot rules (that aren't game specific) from 2010 apply

(<http://usfirst.org/roboticsprograms/frc/content.aspx?id=452>) with the following modifications:

- 1) Since the whole point of BunnyBots is to get new team members up to speed, robots should be built from scratch for the event, just like FRC. You can't use last year's FRC robot with a few tweaks.
- 2) No more than four motors are allowed for propulsion and steering of the robot. This is to keep the robots simple and avoid an undo advantage to veteran teams with their six motor shifting flux capacitor enhanced swerve drives. This is a change from the two motor limit of prior years due to popular demand from teams wanting to experiment with Mecanum drive.
- 3) There are no limits to the number of non-drive system motors on a robot but they must have been legal in FRC sometime over the last five years. In addition you may use any motor currently being sold by BaneBots or AndyMark with the exception of the RS775.
- 4) No bumpers are required though they may be used if desired.
- 5) Electromagnets are not allowed, except as part of motors, relays, valves, etc.
- 6) Robots in their starting configuration without their optional bumper must fit within a rectangle of 28"x38" with a maximum height of 60". Once started, they may extend outside of those dimensions as much as they'd like.
- 7) Robots may not intentionally detach pieces of themselves. Accidentally having parts fall off is fine.
- 8) The maximum weight of a robot, without its battery is 120 lbs, excluding bumpers if used .
- 9) *FIRST electrical rules don't apply. This allows you to use any control system you like, the cRIO controller, 2008 and earlier controllers, vex controllers, RC controllers, etc. Use common sense and follow FIRST wiring guidelines when possible. Make sure your radio system doesn't interfere with FRC radios if you are using something different. Make sure you have a master disable switch.*
- 10) There is no cost accounting for BunnyBots but common sense would say you don't want to spend too much money for BunnyBot parts you can't use again.

- 11) Any part that was legal for any previous FRC competition may be used.
- 12) Vex and FTC parts are allowed.
- 13) There is no requirement that parts used on your BunnyBot be available off the shelf. This allows you to use random parts you might have lying around the shop or that have been removed from other devices. The idea is for people to not spend too much money on this.
- 14) Batteries must have been FRC legal over the last 5 years. Only one battery can be on your robot at a time.
- 15) Each robot must have a place for an alliance flag to be easily inserted and removed. The flag holder should be roughly equivalent to the FIRST design (12" $\frac{1}{2}$ diameter Schedule 40 PVC pipe capped at the end). The flag shaft will be approximately 5/16" in diameter.
- 16) Robots need team numbers. Each Robot should include 11" long or larger labeling on at least two sides. The robot will be announced in the form "Team 1234" by the announcer. If the robot has a name that will be announced as well if it's on the robot. If a given FRC team has more than one BunnyBot, they should be labeled 1234A (Alpha), 1234B (Bravo), 1234C (Charlie), etc. The Robot's team number should be in large type, readable from at least ten feet away. Including your school(s) name and sponsors on the robot would be good marketing but is not absolutely required. Colors and other graphics are up to you. The scoring system will be expecting the A, B, C suffix for teams with multiple robots so don't get creative with the numbering. Save the creativity for the name of your robot.

THE VENUE

The remaining information applies only to the Oregon BunnyBot Competition. Competitions held elsewhere will have their own information here.

BunnyBots is played in covered Tennis Court 1 at Catlin Gabel School next to the Gym. Map and directions are at <http://www.catlin.edu/about/campus/map-and-directions> . Park in the main lot when not dropping off equipment in the circle by the Tennis Courts.

The field will open for teams to practice at 10:00am Saturday, Dec 18th. The doors open at 9:00am for field setup and robot unloading. Teams are free to come anytime between 9:00am and 10:30am. We'll start the actual matches at 11:00am. We'll conclude at 4:00pm unless we go into tie-breaking rounds.

Teams should bring their own lunches or they can buy pizza by the slice on site. There is no off-campus food to speak of within quick walking distance but there is a QFC Supermarket, Starbucks, and a Subway about a mile away down Baner Road.

Teams can bring whatever tools and parts they like but they must take care not to damage the surface of the court. Bring a tarp to put down in your pit area.

Historically we run out of battery power before we run out of fun. Bring as many charged batteries as you can. The rounds go quickly and the batteries don't have much time to recharge. If you are a new team, consider borrowing batteries from a team who isn't taking part. The batteries do wear out after a few years so test them before putting them on the field. Bring as many battery chargers as you can to the event.

Bring a 100' of extension cord and powerstrip.

Bring some signage to identify your team's pit area. This doesn't need to be fancy but should be something that's able to support itself that indicates your team number and name would help other teams, queue staff, and refs find you.

No tables or chairs are provided in the pit areas. If you want either, bring them yourself.

Spectators should bring their own folding chairs for the field. There are no bleachers in these tennis courts.

The pit area size depends on the number of teams registered. Expect them to be at least 9' square but we'll shoot for 10' per robot.

Catlin Gabel's robotics lab is nearby and is available to teams with major machining needs. That means you don't need to bring large power tools. Bringing a drill is always a good idea, though.