

BunnyBots 2017 Rules

Hide and Seek

Version 1.11 9/21/17

BunnyBots is an annual pre-season event designed by Catlin Gabel School FRC Team 1540, the Flaming Chickens. Its purpose is to give new FRC students and teams a chance to get familiar with robot construction before the build season starts while giving veterans the opportunity to try new things and lead. This game is more relaxed than the FRC competitions and all in good fun.

WHO'S INVITED

Team 1540 hosts a competition for PNW 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 (yocumd@catlin.edu) of Team 1540 know if you are interested in doing this so we can share logistical details.

REGISTRATION

Registration for BunnyBots 2017 requires a \$150 per robot fee. We'll waive the fee if this is a hardship. Space is limited so it's first come first served. Your space is not held until registration fees have been received or waived.

You can register online at www.team1540.org/bunnybots. You'd then send a check to:

Dale Yocum

Catlin Gabel School

8825 SW Barnes Rd.

Portland, OR 97225

Please include your team number either on or with the check!

Revision History

This is a living document. The recent rule modifications or edits will be noted here

Version 1 - Sept 1, 2017

Version 1.1 Sept 14th, 2017

Subtle clarifications to the following:

- Handles on buckets are not removed
- Up to 50 auto points are possible PER ROBOT. The wording could have been read per alliance.
- The possession wording was tweaked to avoid confusion with FIRST's use of the word "bulldozing." Basically you are free to push bunnies around, you just can't have control over their movement in all directions.

Version 1.11 Sept 21, 2017

To the Bunnies and Setup section the following has been added for clarification:

"Once the one minute setup period has concluded, teams can adjust the starting position of the robots on their side of the field if they so choose."

GAME SUMMARY

Hide and Seek is played by two alliances of three robots each. During setup, each alliance places 10 stuffed bunnies into 20 buckets on their half of the field by hand. They can be as secretive as they like about which of the buckets on their half of the field have bunnies placed in them. After a 15 second autonomous period, the 2:15 teleop period begins. During teleop, robots seek to get as many bunnies as possible in contact with the carpet their half of the field.

GAME DETAILS

The game is played on a 27' x 54' field covered with standard FRC carpet. Each alliance starts the game with 20 five gallon white plastic buckets on their half of the field <http://www.homedepot.com/p/Leaktite-5-gal-Bucket-5GL-WHITE-PAIL/202264041> (the handles are NOT removed.) These buckets can be arranged upright in any way the alliance likes but MAY NOT BE:

- Nested within one another (though they can be stacked.)

- Outside of the field boundaries.

- In contact with the center line.

- Placed on the opposing side of the field.

- In contact with a robot.

Into ten of these buckets the alliance's team members place small 6" stuffed bunnies. The team can be secretive or open about this placement. Note that these are smaller 6" bunnies than used in previous BunnyBots games. No more than one bunny can be placed in a given bucket at the beginning of the match.

The goal of the game is to get as many bunnies as possible in contact with the carpet on the half of the field closest to the alliance's drivers.

10 points are awarded for each bunny in contact with the carpet at the end of the match and completely on the alliance's half of the field.

Buckets can be nested once the match starts, they just can't start out the game that way.

If a game piece (bunny or bucket) completely leaves the field it is not returned to play.

Robots may not be in possession (see Penalty section for the definition of possession) of more than one bunny at a time. This includes the case of multiple bunnies inside a bucket. It's fine for robots to place multiple bunnies in a bucket but they can't be in possession of the bucket without incurring a penalty (or multiple penalties if there are more than two bunnies were in the bucket .) Assuming the refs notice this, it creates the effect of a “penalty bomb.”

The white bucket specified is the same size and shape as the ubiquitous and cheaper orange “Homer’s Bucket.” Unless you are intending to do vision work, the Homer’s Bucket would be fine for testing purposes back in your lab.

BUNNIES & SETUP

Bunnies are smaller and more consistent this year. We will be using this TY bunny exclusively <http://a.co/eJE9XFk>. Each alliance is given ten of these bunnies during match setup. The alliance has a special one-minute setup period in which to place the bunnies in the 20 buckets they are given and place their buckets as they like on their half of the field (the half closest to the drivers.)

All buckets must be placed right side up at the beginning of the match. They can't be upside down or on their side.

Bunnies must start out the match fully inside their bucket, not on the rim.

Team may not add any other material to buckets or bunnies or modify either in any way.

If at the end of the setup period an alliance hasn't placed all of their bunnies or buckets, the referees will place the unplaced bunnies in contact with the carpet on the opposing side of the field and will place the buckets in a way of their choosing. In other words, have a plan for your bunnies with your alliance partners that you can execute in under a minute!

Once the one minute setup period has concluded, teams can adjust the starting position of the robots on their side of the field if they so choose.

SCORING

An alliance's score is calculated at the end of the match.

10 points for every bunny contacting the carpet on their half of the field. Bunnies in contact with the center line or completely inside a bucket don't count for either side. Bunnies in contact with other bunnies but not in contact with the carpet themselves don't count.

Up to 50 Autonomous points per robot (see "Autonomous section.")

AUTONOMOUS PERIOD

Robots may begin the 15 second autonomous period anywhere touching the edge of the field closest to the drivers and not in contact with a bucket.

Robots get 10 points for some portion of the robot crossing the field midline during autonomous plus...

Robots earn an additional 40 points if they are able to pick up one of the standard field buckets on the opposing alliance's half of the field such that no portion of the bucket is lower than 1" above the carpet at the end of autonomous.

Teams can alternatively bring their own bucket <http://www.homedepot.com/p/Leaktite-5-gal-Bucket-5GL-WHITE-PAIL/202264041> to which they can add vision targets or color of their own design. If this bucket is provided, it is placed directly on the field midline by the team and can not be moved by another until the match starts. It does not take the place of any other bucket on the field. It may start out the match containing a bunny. This bucket is worth 20 points if a robot is able to pick it up during autonomous with no portion of the bucket is lower than 1" above the carpet at the end of autonomous. It must be obvious to the referees that this bucket is a special autonomous bucket by its markings and must include the team's number in an obvious way.

A given robot gets points for only one bucket pickup during autonomous.

Robots are also free to take any other legal action during the autonomous period.

No human interaction is allowed during autonomous. Systems assisted by humans using laptop cameras, IR remote controls, voice, Xbox Kinect, etc. are forbidden and punishable by a red card.

While the nominal length of autonomous is 15 seconds the referees may signal an early end to it if it's clear no robot is doing anything useful. This extra time then goes into teleop. Be sure to alert the referees if your autonomous might be slow to reveal its ultimate awesomeness.

ROBOT RULES

All FRC robot rules (that aren't game specific) from 2017 apply 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 or BunnyBot with a few tweaks.
2. Because the goal of BunnyBots is to increase the skills of students, mentors are encouraged to take an advisory (and not direct fabrication) role when it comes to the robot's fabrication. Mentors should also encourage students to do as much of the design as they can.
3. There are no limits on the number of motors on a robot, but they must have been legal in FRC at some point. In addition you may use any 300, 500, or 700 series motor and any motor sold by AndyMark, VEXPro, or Banebots.
4. Bumpers are optional. If used, bumpers must be constructed generally along FRC techniques. Bumpers are not counted as part of your frame perimeter or weight. The bottom of the bumpers must be at least .5" off the ground and the top no more than 8.5" off the ground. Avoid blue or red bumpers if possible as teams may confuse that for your alliance color. Alliances are indicated by flags in BunnyBots, not bumpers.
5. Robots, excluding their bumpers, must not exceed 28" W x 38" L at the beginning of the match. There is no height limitation. After the match has begun they may extend outside of their initial perimeter as much as 24" total in any direction or directions. So, for example, a robot might extend a single 24" arm out one side but that would mean they couldn't be outside of their initial perimeter on any other side while that arm is deployed. Alternatively they might extend 12" out one side and 12" out another. That's also perfectly fine but no other extensions would be permitted while those appendages are deployed.
6. Robot designers should assume there will be small terrified bunnies laying around on the field and should take care to shield wheels, chains, and gears in drive trains so as not to mutilate them or suck them up into their drive trains.
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, such as the cRIO controller, VEX controllers, RC controllers, infrared, roboRIO, etc. Use common

sense and follow FIRST wiring guidelines when possible. Make sure your radio system doesn't interfere with 5Ghz FRC radios if you are using something different.

10. Do not use anything that relies on normal 2.4 GHz WiFi 802.11b/g to control your robot as experience has shown that to be unreliable due to congestion. If you are using the FRC control system, be sure you are using the 5GHz WiFi band. Note: the Classmate laptop does NOT support the 5GHz band. Either use a laptop that has dual band N wireless or a separate dual band N network adapter. Note that all of this must be battery powered. While there will be AC power at the driver's stations, you'll want to be connected to your robot before arriving at the field. This is so teams can connect their robots and laptops while in queue, which dramatically speeds up matches. In the interest of time, we will not hold the match for you.
11. There is no limit to the equipment used in the driver station though it must all be battery powered and quick to set up.
12. 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.
13. Any part that was legal for any previous FRC competition may be used.
14. 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.
15. The power source for BunnyBots is a single FRC-legal 18Ah battery. Power sources integral to other electronic devices, such as cameras and co-processors, are allowed. That power source just can't be involved in driving motors.
16. Each robot must have a place to insert a flag that identifies their alliance color. The shaft for these flags (provided at the competition) is 5/16" in diameter with flag shafts about 3' high.
17. Each robot must display its team number in 4" or higher characters of a contrasting color on at least two opposing sides; more sides are preferable. Numbers don't have to be on bumpers, but it's an option. The robot will be announced in the form "Team 1234" by the announcer. If the robot has a name, it may be announced if it's on the robot. If a given FRC team has more than one BunnyBot, they should be labeled 1234 followed by a single letter. 1234B, for example, could be announced as 1234 "Bravo" or 1234 "Bogus". It's up to you. Including your school's name and sponsors on the robot would be good marketing and helps the emcee but is not required. The scoring system will be expecting the single letter suffix for teams with multiple robots, so don't get creative with the numbering.

PENALTIES AND RED CARDS

1. OUT OF BOUNDS. A 20 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 must be disabled, manually returned to the playing field, and re-enabled. Wise robot designers will make sure some portion of the robot or bumper contacts the 4x4s before its wheels do.
2. INCURSIONS. Intentional incursions into an opposing alliance's robot's initial frame perimeter will incur a 20 point penalty per incident. Intentional frame incursion with the obvious intent to cause harm to opposing robots will incur a red card.
3. POSSESSION. A 20 point penalty is assessed for every bunny a robot is in possession of beyond one. Possession is defined as having complete control of the bunny's movement (if the robot moves in any direction the bunny moves with it.) Just shoving around a collection of bunnies isn't possession. Throwing a bunch into a hopper on the back of your robot, for example, is. This possession penalty also applies to multiple bunnies inside a bucket the robot has possession of.
4. PINNING. An alliance may not pin an opposing robot that is in contact with a field border, or another robot for more than 5 seconds. A robot will be considered pinned until the robots have separated by at least 6 feet. The pinning robots must then wait for at least 3 seconds before attempting to pin the same robot again. Violation: 20 points initially and 20 points for every five seconds thereafter.
5. UNGRACIOUS BEHAVIOR will not be tolerated. Penalties are up to the referees and can range from a warning to 20 point penalties to red cards. Aggressive game play isn't ungracious as long as it's within the spirit of the rules. Being a jerk...that's ungracious.
6. This BunnyBot game is a contact sport, and as such, there is no penalty for high-speed ramming. Robots should be designed robustly with this in mind. This is also why bumpers might be a good idea (though they aren't required.)
7. Teams should keep in mind that spectators will be standing close to the field. Robots employing strategies that might harm people will be disqualified.
8. If the opposing alliance performs an action that causes a team to violate the rules, no penalty will be assessed. This is up to the referees and is judged on a case-by-case basis. Excluded from this is robots placing multiple bunnies in a bucket and encouraging the opposing team to pick it up. That "possession bomb" is part of the game.
9. Electronic communication with the drive team or those in the general area is not allowed when the match is underway. Warning followed by red card.

10. Red cards zero the score for the entire alliance.

RULE CHANGES

BunnyBots is intended as a fun way for teams to gain experience building robots before build season. The rules can't be as carefully tested as an official FIRST game. We don't always know how the game will play until we start to play it the day of the competition. The game design committee reserves the right to tweak the rules as the fall season progresses as well as the day of the competition as we see how the matches play. Teams that discover what they suspect is a game breaking strategy should bounce that off Dale Yocum before devoting too much time to it. Those kind of oversights on the part of the game design committee could easily be plugged on the day of the competition. The goal is to maximize the enjoyment of everyone not reward the cleverness of one team.

QUEUES

When a team is ready to play, they get in the queue. Teams are on their honor that when they are in the queue, their robot is functional. Teams may not do more than trivial repairs to their robots while they are in the queue and can't use power tools. Of course, the more matches you play, the higher your qualification score (see qualification points below). Building a reliable robot is critical.

Teams will draw a colored Lego block from a box once they enter the queue. Red or blue blocks mean you are on that alliance next. Yellow means you sit out a round but will be guaranteed of playing in the next match. This is done to mix up the matches and not have the same teams playing one another over and over. There are three red, three blue and two yellow blocks in the box.

A robot is not in queue unless the robot, the driver's station, and at least two team members are present. You can't save a space in line.

Each team will have a pit area in the building next to the arena. This is where robots go for most repairs. They are not in the queue while in the pit area nor will queue staff go looking for them there. It's the responsibility of the team to get in queue every time they are ready to play a match.

QUALIFICATION POINTS AND FINAL MATCHES

After playing a match teams earn qualifications points using the formulas below.

Winning Alliance Qualification Points = $W + L/2$

Loser Qualification Points = L

Tie Qualification Points = W

Where W is the winner's score (or either robot's score in a tie), L is the loser's score. If L or W is negative, it will be rounded up to zero when determining qualification scores.

At 3:00pm or as soon as the closest match is concluded, the four robots with the highest accumulated qualification points become the alliance captains for the semifinals. If there's a tie among the top four they will draw straws for their rank. They choose three teams each to play with them in the final 3 vs 3 matches. Each alliance therefore has their own backup robot. Since there are four robots per alliance, one robot will sit out each match. The mix is up to the alliance captain. Because there are backups on each alliance, there are no timeouts.

The team with the most qualification points picks first. The top four teams cannot pick one another nor can a team captain from a school pick another robot from the same school. The pick order is 1-4, 4-1, 1-4. The alliances then play in typical FRC fashion; the number 1 alliance plays the number 4 alliance, 2 plays 3. The winners of each of those match ups play for the winner and finalist trophies.

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 the gym at Catlin Gabel School. Map and directions are at <http://www.catlin.edu/map>. Park in the main lot when not dropping off equipment in the circle by the Tennis Court. The pit area will be in covered Tennis Court 1 next to the gym.

The doors open at 8:00am Dec 9th for pit setup and robot unloading. Teams are free to come anytime between 8:00am and 9:30am. (Teams can also drop off robots and pit equipment between 5:30pm and 9:00pm Friday night Dec 8th.) The field will open for teams to practice between 8:30am and 9:30am Saturday. Opening remarks and the drivers meeting will be at 9:30am. We'll start the matches soon thereafter. Qualification matches will be over around 3:00pm followed by alliance selection and elimination matches. Those matches will typically be over around 4:30pm.

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 Subway about a mile east on Barnes Road.

Whatever driver station solution you choose must be battery powered, as must the laptop if used. This is to ensure that every robot can be turned on and synced with its driver station while in queue speeding up the matches. Teams with laptops with poor batteries, or those using routers as their driver's station radios, may want to invest in an inexpensive inverter driven by a robot battery. You can wire your own from something like <http://amzn.com/B000NP30HC> and an Anderson battery connector.

There will be AC power at the driver's stations, which you are welcome to use as long as your laptop stays connected to the robot during the transition from battery power.

Teams and spectators must not use the 5ghz WiFi band as that is reserved for robot use. We will be scanning for hotspots in this band so please just don't do it. Our scorekeeping system this year doesn't rely on WiFi for the 2.4Ghz band is open.

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

Teams may not have any drinking fluids other than water in the pit area. When these spill, and they will, it causes significant damage to the surface.

Bring as many charged batteries as you can. The rounds go quickly and the batteries sometimes don't have much time to recharge. If you are a new team, consider borrowing batteries and chargers from a team who isn't taking part or buy extras from AndyMark. The batteries do wear out after a few years so test them before putting them on the field. Bring as many 6 amp or lower battery chargers as you can to the event.

Each team should bring a 8.5" x 11" cardstock with their team number printed on it in portrait orientation. That team number should be at least 4" tall. This is used in lieu of spiffy electronic displays you'd find at a FIRST event and helps the emcee and spectators tell who's controlling what robot. There will be a place to put that card when the team comes to the driver's table. The card could also have the robot name on it if desired.

Bring 100' of extension cord and two powerstrips.

You will need to bring whatever remote control hardware you need. There is no field control system. Teams using the cRIO or RoboRIO will need to operate in the 5Ghz "N" band using either a laptop with dual band N capability or an aftermarket dual N network adapter plugged into a laptop without dual-band N. DO NOT expect to use a laptop with wireless G only as the interference will be extreme and your connection unreliable. The Classmate does not have dual band N capability.

Remember, everything must be battery powered and be able to be powered up while in queue to sync the radios before entering the field.

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 to 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. There are bleachers in the gym competition arena so visitors should not bring their own seating.

The pit area size will be a minimum of 10'x10'.

You'll want to bring your robot cart as the pit areas aren't in the same building as the competition arena. Four inch minimum wheel size.

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 hand drill is always a good idea.