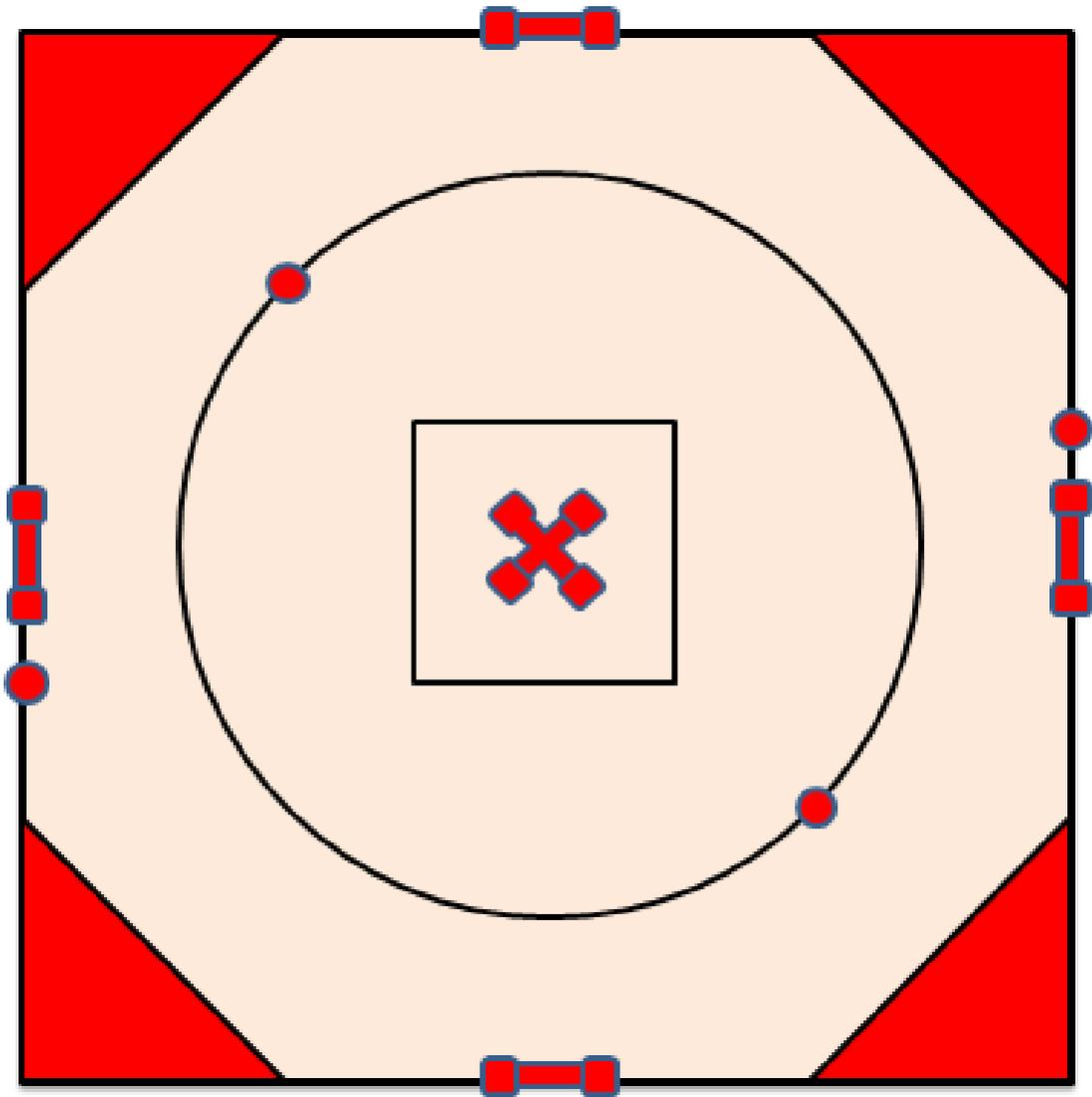


RING FLING

Skunk Works Robotics Boys and Girls Club 2016-2017 Game

The Game



This year Skunk Works Robotics has designed our own version of a FIRST Lego League competition for you all to play. The image above this paragraph shows the basic outline of the arena that you all will be building robots to play in. The main objective of this game is to build a robot out of your own EV3 kit of parts to complete various objectives. There are a variety of ways that you can score points, and so it's up to your teams to create the best strategy, to create a

robot to play through your strategies, and refine your design to improve your score. We hope it is fun for you guys, and we think it will be a great challenge for you all to conquer!

Playing the Game

In this game each team will use the robots they build to compete in matches with a two minute duration. The objective is to score as many points as possible in this two minute period. It will be a challenging task, but if a team is able to build a build the perfect robot they can score over 800 points.

1. The Scoring pieces are $\frac{3}{4}$ " black rings made of plastic of two sizes,
 - a. 3" diameter
 - b. 2" diameter
2. The large rings start the game hung from the side posts. There are two on each side post on opposite sides.
3. The small rings start the game in the corners of the game field. There are two in each corner.
4. The small rings may be manipulated by hand in the corner. They may only be moved from one corner to another by the robot
5. The large rings may not be touched except by the robot, even if they are in the corner area. Touching a large ring is a 10 point penalty.
6. There are two scoring posts on the field and one scoring area. The scoring area is the square in the middle of the field. There are 4 short posts located at various positions around the field at the beginning and a large four armed post in the middle of the field.
7. The middle post is immobile and if it is knocked over results in a 100 point penalty. On the competition field, double stick tape holds the middle post to the field. The short posts are mobile and can be moved by the robot on the field and can be manipulated in the corners by hand. Touching them while on the field results in a 25 point penalty.
8. Scoring is done in a number of ways.
9. Small rings are scored 10 points each if they are on a short post and the short post is in the middle at the end of the game. They are also scored 50 points each if they are hung from the center post at the end of the game.
10. Large rings are scored 5 points if they are in the middle square at the end of the game and not hung from a post. Large rings are scored 20 points each if they are on a short post and 20 bonus points (total of 40 each) if that short post is in the middle at the end of the game. Large rings that are hung from the center post at the end of the game are worth 100 points each. In addition, if the large rings are knocked off their starting position on the side post, they score 5 points each.
11. Posts or rings are considered to be scored if any part of the post or ring is touching the square in the middle of the field at the end of the game AND not touching a robot. Rings on the center post cannot be touching a robot at the end of the game.

Action	Points (all points assessed at end of game)
Placing small ring on short post and moving post to center square by end of game.	10 points per ring
Placing large ring on short post, (2X bonus if in center square at end of game)	20 points per ring (40 points each with bonus)
Removing large ring from starting side post	5 points per ring
Placing small ring on center post	50 points per ring
Placing large ring on center post	100 points per ring
Placing large ring in the center square	5 points per ring
PENALTIES	Points assessed at time of penalty
Touching robot if not in corner (The robot is considered in the corner when it is TOUCHING the corner area. Be careful as this means touching and not just in,)	5 points per touch
Knocking over a side post	10 points per post and any large rings from that post are not scored and taken out of play if on the post at time it is knocked over.
Knocking over the Center Post	100 point penalty
Touching a large ring	10 point penalty per touch and ring is put out of play for rest of game.
Touching a Short Post not in the Interaction Zone (Corner area)	25 point penalty and Short Post is removed from game.

While these are the ways that your robot can score points in this game, there are a few more rules to consider while building your robots:

1. Robots must be able to completely fit inside of one of the interaction zones at the beginning of the match. These are the corner areas.
2. Human players (that means you!) can touch your robot while it is in any of the interaction zones as well as game pieces (except the Large Rings) that your robot pushes into any of the interaction zones
 - a. This means that you can pick up your robot in an interaction zone and have it start in a different interaction zone but you may not move rings or the short post from zone to zone in this manner.
 - b. Whenever you enter an interaction zone you can reconfigure your robot mechanically or stop a program and restart that program or another one.
 - c. And you can even have your robot push small rings into the interaction zone so that you can pick them up and place them directly into your robot or a post that is in the zone. Be careful of the large rings though. They can NEVER be touched even in the interaction zones. Touching one will remove it from the game and have a 10 point penalty.
3. The two minute match timer starts from the first time a team hits the “go” button on their robot
4. Once a robot has successfully removed all of the large rings from a side post, you may request that the referee remove the side post. Knocked over side posts are automatically removed from the game. If large rings were on them when this occurs the large rings are also removed from the game.
5. In order to be considered “inside” a zone, a game piece or your robot only has to be **touching** the line of that zone. For example a ring with just part of the base touching the line of the square will be considered “inside” the square. Additionally, a robot with just one part of the robot touching somewhere inside the interaction zone will be considered inside the interaction zone but it **MUST** be touching.

Giving Teams Points

And so that’s how the game is played. This next set of rules is only for the referees to help streamline scoring matches. Referees will hand teams poker chips that represent penalty points to be deducted after scoring at the end of the game.

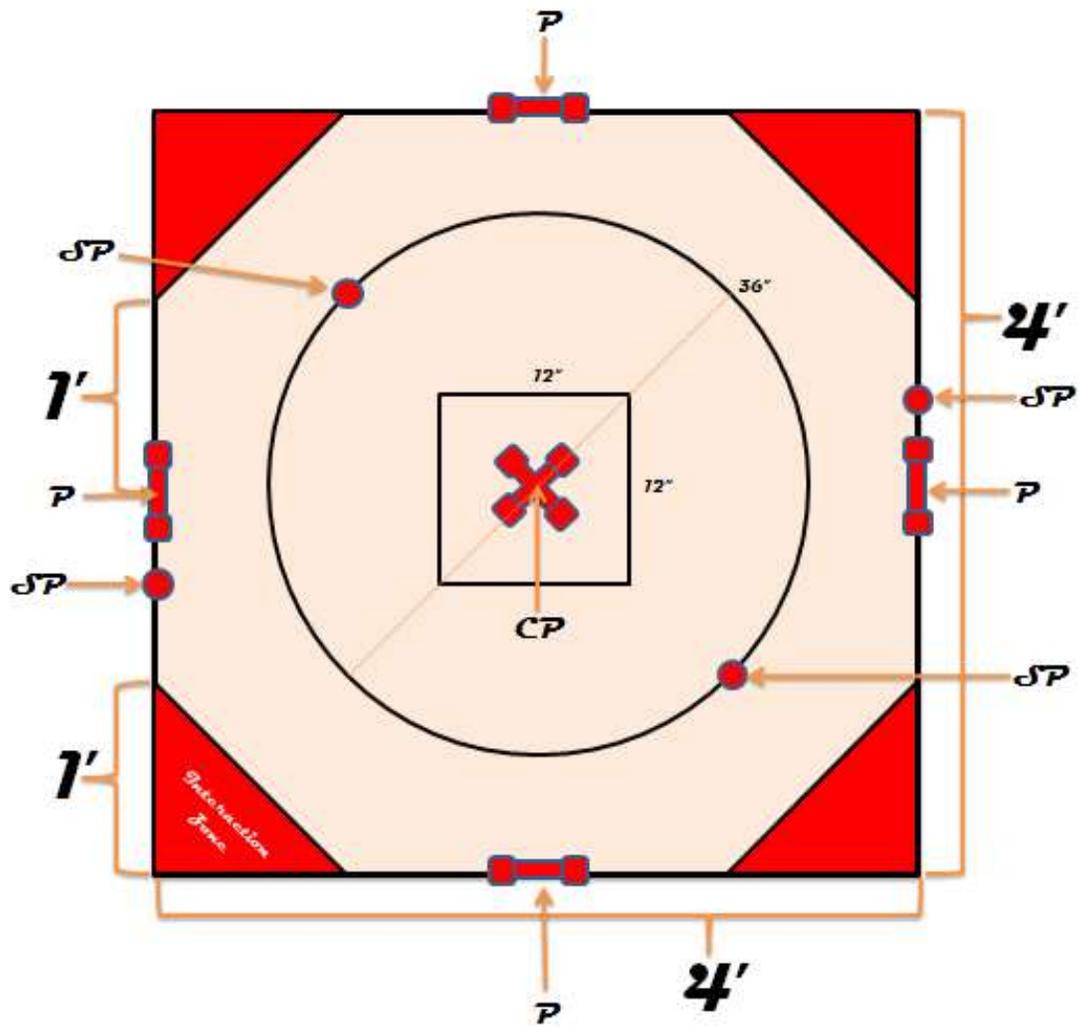
Color	Point Value
White	-5
Blue	-10
Red	-50

The game will be scored at the end of the game. The penalty points will be deducted from that score.

Glossary

- This game is played on a 4x4 ARENA made out of whiteboard material
- There are 4 plastic SHORT POSTS that are positioned in various places on the field.
- There are 4 plastic SIDE POSTS placed in between the interaction zones and at the edge of the arena board
- There is one four-armed CENTER POST in the middle of the ARENA. It is taped to the Arena board.
- The four corners of the field are called the INTERACTION ZONE
- There will be 2 SMALL RINGS placed into each INTERACTION ZONE at the start of the game (total of 8 SMALL RINGS)
- There will be 2 LARGE RINGS hung from each SIDE POST at the beginning of the game. (total of 8 LARGE RINGS)
- The Center Square will be 12”X12”
- Each team will make one machine from their EV3 kit and this machine will be referred to as the ROBOT

The Arena



- The ARENA is made out of a 4'x 4' whiteboard material
- The interior square is 12" X 12" and its center is located at the center of the 4'x 4' ARENA
- The SIDE POSTS are initially located as shown in the diagram (P)
- The SHORT POSTS are initially located as shown in the diagram above (SP)
- The CENTER POST is located as shown in the diagram above (CP)
- The INTERACTION ZONES are triangles with side lengths 12" measured from the corners of the ARENA
- The SMALL RINGS can be placed anywhere in each INTERACTION ZONE with 2 SMALL RINGS in each zone
- The LARGE RINGS are hung from the SIDE POSTS initially with one on each side of the post.