

## AgRobotics Game Design, Objectives, and Rules

In addition to this document, please refer to the respective show's website for general contest rules and contestant eligibility. Designated livestock shows using this game format will use the set of known challenges, outlined below, as well as additional unknown challenges that will be released on the day of each contest. Each show's unknown challenges will be different than others. Teams must pre-build and pre-program their robot prior to the competition for the known challenges. On the day of the contest, time will be given to account for additional building and programming for the unknown challenges. Teams will be allowed access to the game tables during this time.

### Game Theme

Ag Emergency 911!

### Known Game Objectives

- Electrical Grid Challenge
- Water Pipes Challenge
- Feed Supply Point Challenge

### Game Mat Layout



The image shown above will be available for teams to download and printed at a source of your choosing. It will also be available to order at [Geyer Instructional Products](#). The game mat will fit inside a standard robotics game table frame.

The area located outside THE HIVE is collectively called the GAME ZONE.

1. PLAYER ZONE
  - a) HOME BASE
2. GAME ZONE
  - a) CATTLE FEED DELIVERY
  - b) CROPS
  - c) FEED SUPPLY PICKUP
  - d) HIGHER GROUND
  - e) SICK ANIMAL DELIVERY
  - f) CHICKEN FEED DELIVERY
  - g) ELECTRICAL GRID
  - h) SHEEP FEED DELIVERY

## Scoring

Obj. #	Objective	Description	Point Value
<b>1.</b>	<p><b>CHECK THE PERIMETER FENCES</b></p> <p>The road includes the black line, white lines, and the outside dirt road boundary.</p>	<p>The robot must follow the black line road from the HOME BASE, then circle around the CROPS and CATTLE FEED DELIVERY and return To HOME BASE.</p> <p>The robot must stay on course the duration of the trek. Staying on course is defined as at least one wheel of the robot continuously touching any portion of the road.</p> <p>If a color or light sensor is used for the duration of the trek, bonus points will be awarded. The team captain must notify the judge before starting the challenge that the sensor will be used.</p>	<p>100 points for completing the trek (unaided by color/light sensor)</p> <p>100-point bonus for incorporating the color/light sensor</p> <hr/> <p>200 points maximum</p>
<b>2.</b>	<p><b>ELECTRICAL GRID CHALLENGE – RECONNECT THE POWER LINE</b></p>	<p>The robot must pick up the metal ring from Hook A and place it on Hook B.</p> <p>Points are awarded when the challenge has been successfully completed.</p>	<p>150 points for successfully completing the challenge.</p> <hr/> <p>150 points maximum</p>

	<p>There will be a metal shower ring with a string attached to it and to a "hook". The string will be approximately 15-20" in length. Each hook will be a metal door stop screwed into the wall of the game table 1" below the top of the board. The ring will be placed on a Hook A near the ELECTRICAL GRID. Hook B will also be located near the grid.</p>		
<p><b>3.</b></p>	<p><b>ELECTRICAL GRID CHALLENGE – FLIP THE BREAKER</b></p> <p>The breaker will consist of an electrical switch inside a single gang switch box. A black piece of electrical tape will be placed on one side of the switch.</p>	<p><b>Prerequisite:</b> Objective 2 must have been successfully completed.</p> <p>Once the prerequisite has been met, the robot must press the electrical switch on the side marked with the black electrical tape.</p>	<p>50 points for successfully completing the challenge.</p> <p>No points awarded if the prerequisites are not met.</p> <hr/> <p>50 points maximum</p>
<p><b>4.</b></p>	<p><b>WATER PIPES CHALLENGE</b></p>	<p>PVC pipes must be placed inside the designated cradles. Both ends must not be touching the game mat.</p>	<p>25 points for each pipe correctly placed.</p> <hr/>



2" PVC couplings will be cut length wise. The U-shape will face upward. The coupling will be adhered on the bottom of the piece and to the game mat using Velcro strips. 2" 90-degree elbows will be used on the corners of the pipeline.

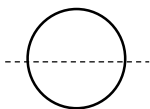
Couplings and elbows will be placed in designated locations and will serve as a "cradle" for the pipes. Some pipes will be present and some missing the day of the contest.

Three pipe sections that need to be replaced will be announced the morning of the contest.

Pipes that need to be delivered will be located in the resource tray at the beginning on the match. Pipes will be 1/2" diameter and 7" long.




The elbow and coupling will be cut along this axis.



Points for this objective are awarded at the end of the match.

75 points maximum

<p><b>5.</b></p>	<p><b>FEED SUPPLY CHALLENGE</b></p> <p>Feed bags will be represented by <a href="#">Bean bags</a>.</p> <p>Bags will be located in the FEED SUPPLY PICKUP at the beginning of the match.</p>	<p>2 feed bags will be delivered to the CATTLE FEED DELIVERY.</p> <p>1 feed bag will be delivered to the CHICKEN FEED DELIVERY.</p> <p>1 feed bag will be delivered to the SHEEP FEED DELIVERY.</p> <div style="text-align: center;">  </div> <p>Points for this objective are awarded at the end of the match.</p>	<p>10 points per feed bag successfully delivered</p> <p>40-point bonus for placing all feed bags.</p> <hr/> <p>80 points maximum</p>
<p><b>ALL KNOWN CHALLENGES</b></p>			<p>555 points maximum</p>

**Game Piece List**

(no product or company endorsement implied nor intended)

Product Description	Quantity Used in Game	Source
Printed vinyl game mat	1	Sign Printing Company
Shower Curtain Ring	1	Home Goods
Metal Door Stop	2	Hardware
String	1	Hardware/Home Goods
Electrical Switch	1	Hardware
Single Gang Box	1	Hardware
Bean Bags	4	Amazon

## Rules of Play

1. At the beginning of the match, your team's robot must start in HOME BASE. At least one part of the robot must be touching inside the border of HOME BASE.
2. The GAME ZONE is the area outside of HOME BASE.
3. The RESOURCE TRAY is a plastic tray that will be placed on the outside of the game table and will hold game pieces for known and/or unknown challenge.
4. Robots must be launched from HOME BASE throughout the match. Before being launched, at least one part of the robot must be touching inside HOME BASE boundary.
5. Each match will be 3 minutes long.
6. Time begins when the announcer says "**BEGIN**" and continues until the announcer says, "**TIME**".
7. Robots must complete all challenges autonomously.
8. Any structures built by the team cannot be placed onto the GAME ZONE by human players but is permitted to be placed by the robot so long as it is done autonomously and is permitted by challenge rules.
9. No containers used by game officials to store game pieces can be used by the team/robot.
10. Players may retrieve their robot at any time during the match without penalty. When retrieved, the robot must return to HOME BASE. Judges will not assist in retrieval.
11. Possession is defined as a piece that is not touching the playing surface and is under the control of the robot.
12. Items in possession of a robot may be retrieved once any part/piece of the robot has broken the plane of THE HIVE boundary.
13. If the robot is in possession of a game piece in the GAME ZONE, and the robot is retrieved by the player, the game official will return the game piece(s) to its original location/state.
14. A player is not allowed to touch any game piece except when the piece is completely inside the HOME BASE boundary, OR if the robot is deemed in HOME BASE AND in full possession of a game piece(s). Once the piece is deemed inside HOME BASE, contestants may remove the game piece from the game table/robot and store it in the RESOURCE TRAY.
15. If a contestant intentionally touches a game piece in the GAME ZONE, the team will be given a 50-point penalty per occurrence. Judges will issue one warning for the first offense. In such cases, the piece will be returned to its original starting position by contest officials as quickly as possible.
16. All competing team members are allowed around the game table during competition, and any member may touch the robot if necessary.
17. Teams not competing must remain at their tables or staging area.
18. Good sportsmanship is always expected. This is crucial during practice times. Practice time on the game table may be restricted as build time progresses.
19. At the conclusion of the match, it is the responsibility of the team captain to review the score sheet with the judge and then initial at the bottom, signifying agreement of the final match score. Scores are final after this point and cannot be contested.