Storyline

The tasks include a short storyline to make the competition interesting. As you read, focus on what your robot must do, the skills it needs, and the rules for each task. The story adds to the theme, but the task steps and scoring rules are what matter most.

Welcome to the Fort Bend ISD Robo Open! In this robot golf challenge, your team will design, build, and program a robot to complete tasks around the course and try to score a hole in one.

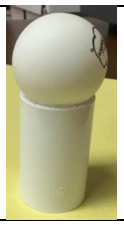
Your robot will complete tasks around the mat. Elementary teams will complete three tasks. Middle school teams will complete four tasks, including Task 4, which uses text-based coding. Tasks must be attempted in order, and your team should make a good attempt at each task before moving to the next one. Points will be scored during the competition.

Tasks

Your team has five minutes to complete the challenge. Tasks must be attempted in order: Task 1, Task 2, Task 3, and, for middle school teams, Task 4. You do not have to complete every task, but you must make a good attempt before moving on to the next one. Your robot can earn points for each part it completes, so allow the program to run instead of resetting repeatedly. Middle school teams will complete the text-based coding task after Tasks 1–3.

Obstacles

During the competition, the robot must avoid various obstacles.

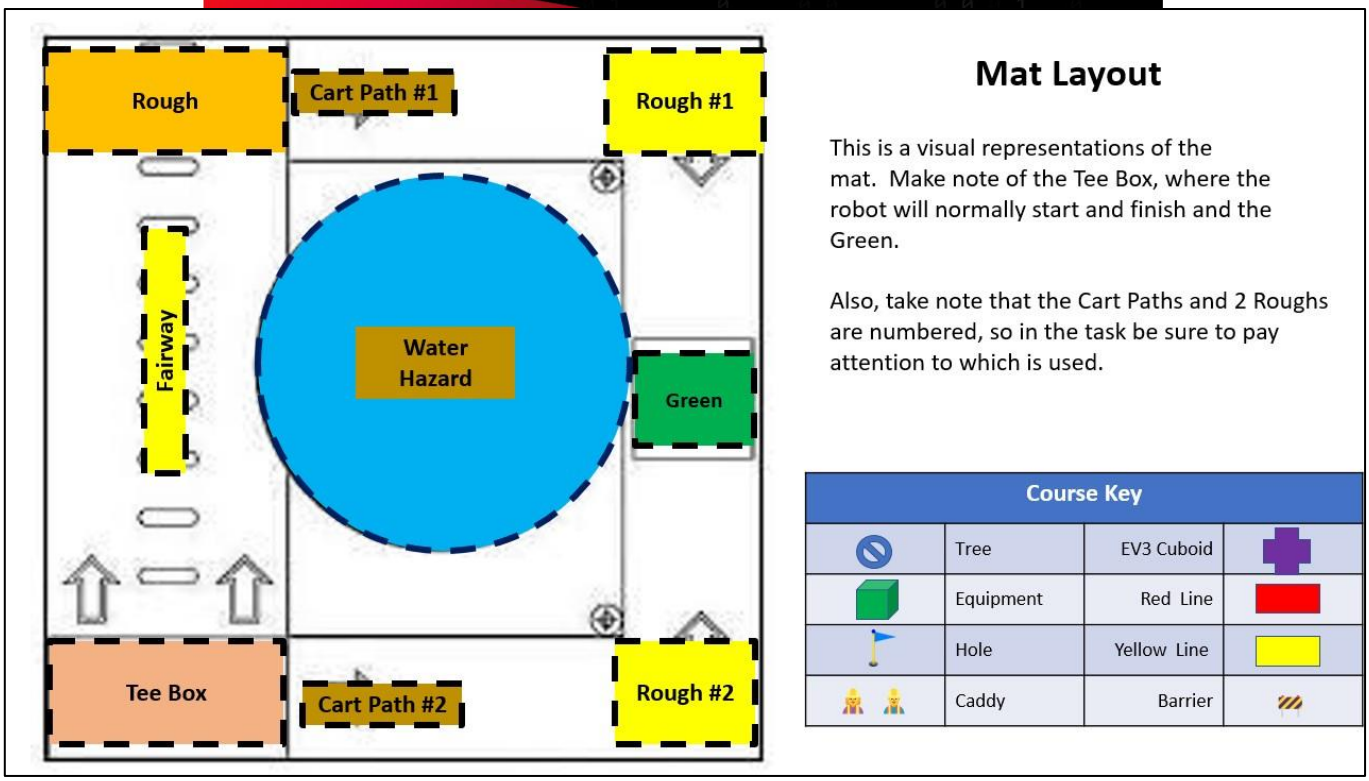
The first obstacle is a ping pong ball placed on top of a PVC coupling. This obstacle counts as touched if the ball falls off. Do not glue, alter, or modify the PVC coupling or ping pong ball in any way.	
Another obstacle is the 11 by 15 Technic frame which will be used to represent a golf hole on the green. The frame should be laid flat and must stay inside the green area. The tasks will explain how this obstacle is used.	

Starting Point

The Starting Point is where your robot begins and ends each task unless the directions state otherwise. The map shows the different areas of the mat. To start a task, both drive wheels must be inside the Starting Point. When the robot returns to the Starting Point or another area, it counts as “in” if at least one wheel is inside that area. At least one wheel must stay on the mat at all times. If both wheels leave the mat, the team receives a point deduction.

Note: Some tasks may use extra items that are placed around the mat, such as colored paper strips. Judges will explain where these items should be placed.

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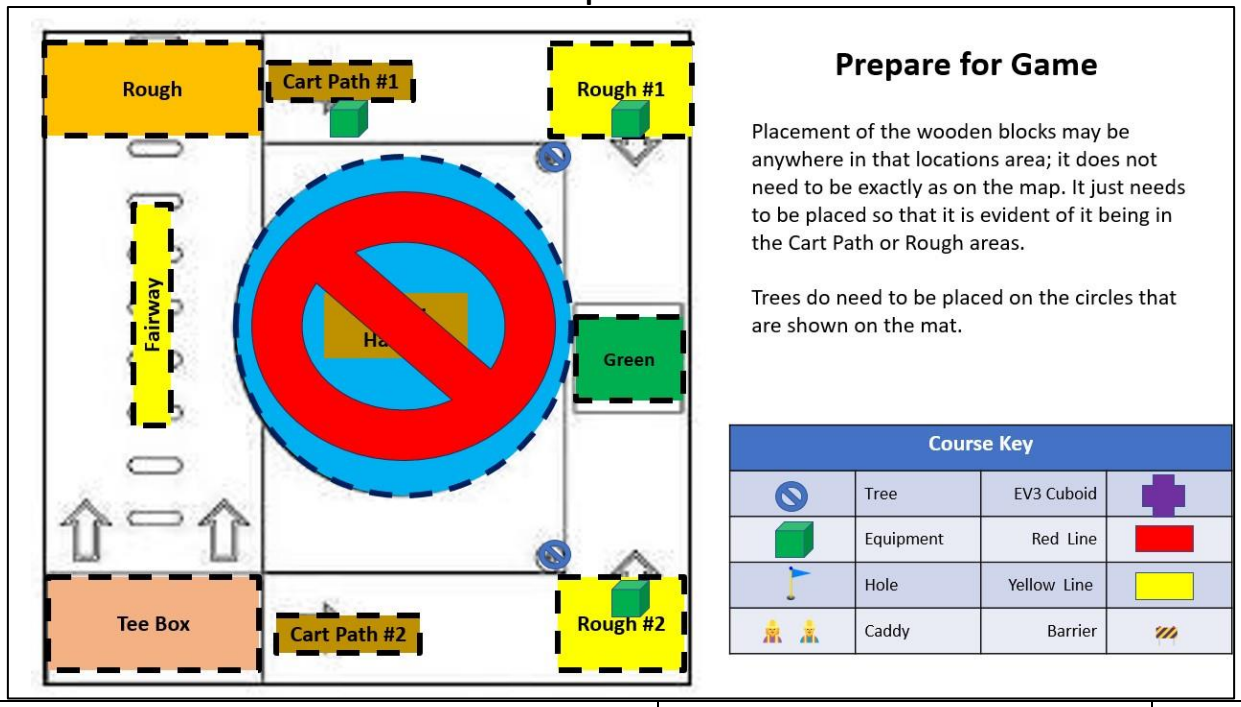


Key and Item Description

Equipment or map locations	On map named	Represented on map by
Starting Point	Tee Box	See map above
Wooden Blocks	Equipment	
PVC and Ping-Pong Obstacle	Tree	
Barrier (yellow plate)	Barrier	
11 by 15 technic frame	Hole	
Kate and/or Kyle	Caddy	
Red card and Yellow Card	Red or Yellow Line	
EV3 Cuboid	EV3 Cubiod	

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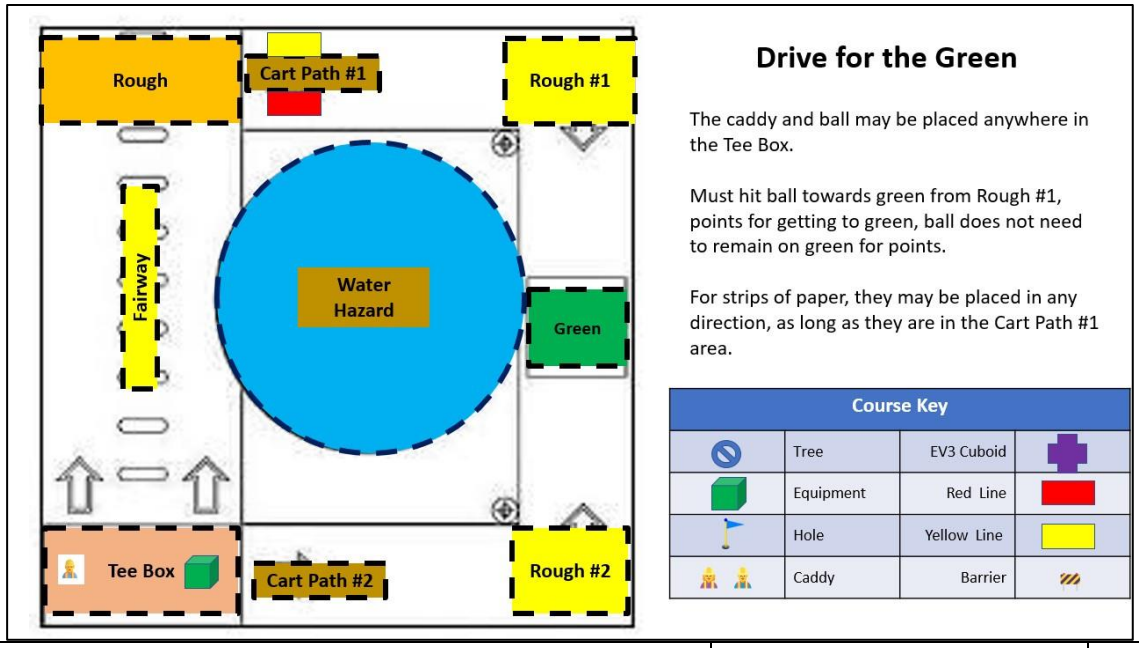
Task 1 – Prepare for Game



Task	Possible Points	Score
Start with both wheels in the Tee Box. Wave to the crowd by moving the robot's arms up and down or side to side.	+10	____/10
Say or show, "Oops, forgot my clubs."	+5	____/5
Travel to Cart Path #1 without entering the Water Hazard. Retrieve the clubs (wooden block).	+5 points travel to cart path, avoid Water Hazard +5 points touching block	____/10
Return to the Tee Box and drop off the clubs in the box.	+5 points returning to Tee Box +5 points if clubs remaining in Tee Box throughout the task (added at end)	___5
Travel to Rough #1 and Rough #2 to retrieve the golf balls. Golf balls may be wooden blocks or ping pong balls. Retrieve one at a time or both together.	+5 points for each golf ball touched	____/10
Avoid knocking over trees during the task.	+5 points per tree not touched	____/10
Return the golf balls to the Tee Box.	+5 Return to Tee Box +5 points for each golf ball that remains in Tee Box at end of task (added at end)	____/5
Say or show "Fore," then make a 360-degree turn while in the Tee Box.	+10 points for making a complete turn +5 points for each club or golf balls that stays in Tee Box	____/25
Finish in the Tee Box with at least one wheel inside, or breaking, the boundary.	+5	____/5
Penalty points: -5 points for each reset, -5 for both wheels off mat		____
	Points Awarded for this task	___/85

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Task 2 – Drive for the Green



Task	Possible Points	Score
Start with both wheels, the golf ball, and the caddy in the Tee Box. The robot, golf ball, and caddy must not touch one another. Make a 360-degree turn without touching the caddy. The robot may secure the golf ball first.	+10 for turn -5 if Caddy touched	____/10
Navigate to the Fairway with the golf ball.	+5 navigating to Fairway +5 for having golf ball	____/10
Set the golf ball in the Fairway.	+5	____/5
Make a 360-degree turn in the Fairway without touching the golf ball.	+10 for full turn -5 if golf ball touched	____/10
Secure the golf ball and drive to Rough #1 by crossing the Water Hazard. Both wheels should pass through the Water Hazard.	+5 for touching golf ball +5 for crossing Water Hazard	____/10
Set the golf ball in Rough #1 so that it remains in place.	+5 for getting to Rough #1 +5 for bringing Golf Ball	____/10
The robot must strike the stationary golf ball in a single swinging motion. Continuous pushing or carrying is not permitted. Points are awarded if it makes it to the green; ball does not need to remain on the green for this task.	+5 for hitting Golf Ball +5 hitting in correct direction +5 for making to Green	____/15
Return to the Tee Box by going towards Cart Path #1. At the Cart Path the robot must stop and scan a red or yellow piece of paper. Correctly display or announce the sentence corresponding to the detected color. If Yellow, robot will show or say, "I shot par today." If red, the robot will show or say "Maybe golf isn't my game."	+5 Head towards Cart Path #1 +5 Correctly say sentence based off of paper color	____/10
Continue to the Tee Box with at least one wheel inside or breaking the boundary.	+5 One wheel in Tee Box	____/5
Penalty points: -5 points for each reset, -5 for both wheels off mat		____
	Points Awarded for this task	___/85

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Task 3 – Hole in One

Procedure for this task

When you finish Task 2 and are ready for Task 3, tell the judge, "Stop the Timer."

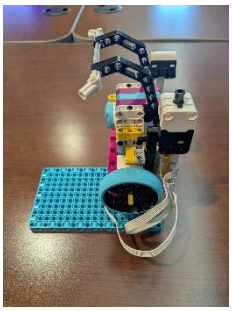
The judge will stop the time and tell you how much of the 5 minutes is left. That remaining time is your time for Task 3.
Example: If the timer stops at 3 minutes, you have 2 minutes for Task 3.

After the judge gives you the remaining time, your team gets 2 minutes to prepare the robot, choose your shots, and set up the golf hole.

The 2-minute planning time does not count against your remaining time, so use it wisely. When you are ready, start the robot. The timer begins again when the robot moves or shoots.

Information about shooting and points:

- Your robot will shoot from different locations using the time you have left. See the map for shooting locations.
- You may use a different golf ball for each shot. It must be a wooden block, ping pong ball, cotton ball, or real golf ball. Real golf balls are not provided.
- Your robot can earn 15 bonus points for each completed shot if it is standing upright instead of driving like it did in Tasks 1 and 2. See image for example of vertical robot.
- Each shooting location is worth a set number of points. You can score from each location only once. You may try as many shots as needed, and they do not count as resets. After the first shot from a location, each extra shot subtracts 1 point from the points earned.
- Once you score points, you keep them, even if you try again and score less or time runs out during another shot but remember that you lose points for the more shots you take.



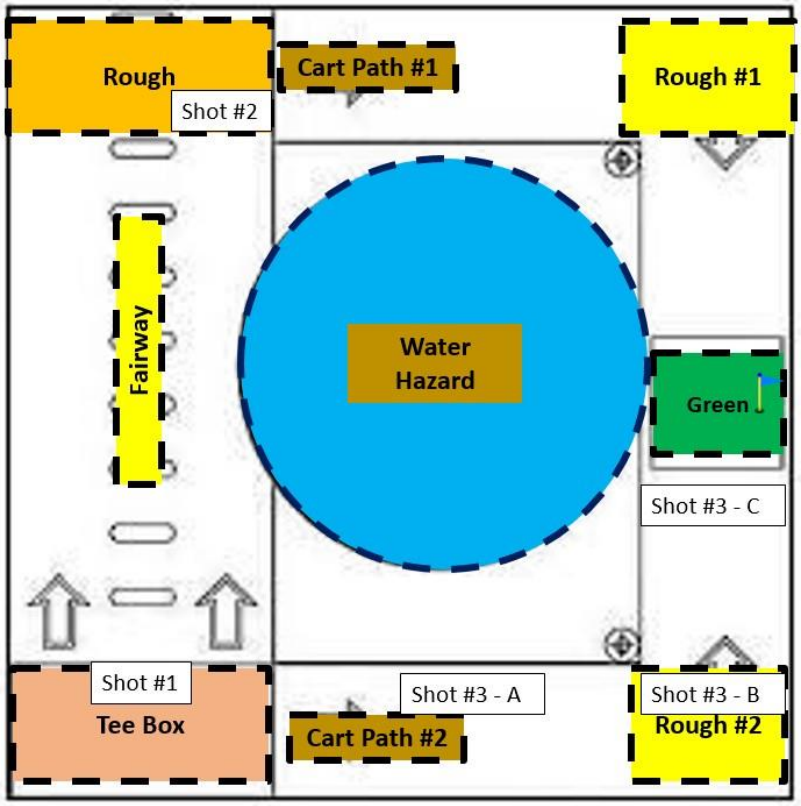
Example: You score 30 points on the first shot; you try again two more times but each time you do worse. Because of the two extra attempts, your score would be 30-2=28 points. 30 points from the first attempt but then –2 for the two extra attempts.

- You may move the robot by hand to each map location. This does not count as a reset or restart. Penalties still apply if the robot goes off the mat.
- You may build a base for the golf ball using extra pieces from your kit. You do not have to use the base at every location.
- Read each shot description carefully so you know what the robot and golf ball must do.

The Hole

Using the 11 by 15 technic frame, you will create a hole for the golf ball to land in for the shots. It must lay flat on the mat inside the Green but may be turned in any direction within the Green area. The hole must be set up during the 2-minute planning time. You may also use 1 index card to create a ramp for the hole. Index card may be cut to create multiple ramps and may be taped down to the mat.

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Hole in One

Robot will shoot from locations below.

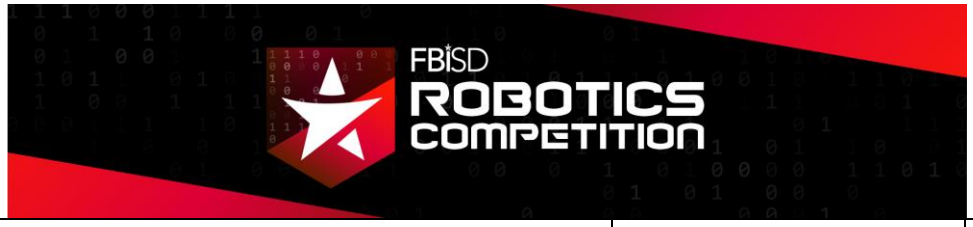
The Hole is set up anywhere in the green area and should stay in that location for all shots.

Note, like in golf, you want to take the fewest number of shots. Shots taken past the first shot from each location will lose points.

There are also points for the robot being placed in a vertical position.

Course Key			
	Tree	EV3 Cuboid	
	Equipment	Red Line	
	Hole	Yellow Line	
	Caddy	Barrier	

Task	Possible Points	Score
Shot #1 – Robot must hit golf ball from the Tee Box. Points may be earned as follows: • Robot is in vertical position • For each of the first 7 ovals crossed in Fairway, 5 points each, max 35 points • Minus 5 points if ball lands in the Water Hazard, off either side of the Fairway, or in the Rough. • Minus 1 point for each shot attempted after the first shot.	+15 Vertical Robot +35 Fairway shot -5 ball in Water Hazard, off Fairway, or in Rough	____/15 Vertical Robot ____/35 Fairway shot ____/-5 Penalty for off shot
	Additional Shots taken _____	____/50
Shot #2 – Robot is trying to get to the Green. Points may be earned as follows: • Robot is in vertical position, 15 points They then may take one of two approach shots: Approach 1 – Hit from the Rough towards the Green, going over the Water Hazard.	+15 Robot Vertical Approach #1 • +30 makes it to, and stays on the Green • +10 ball then ends up in the hole	____/15 Vertical Robot ____/30 where ball lands



Approach 2 – Hit from the Rough but instead of going over the Water Hazard, play it safe and lay up towards Rough #1. • Minus 1 point for each shot attempted after the first shot.	• +20 lands and stays in the Water Hazard • +10 goes off the mat Approach #2 • +10 lands and stays on Cart Path #1 • +20 lands and stays on Rough #1 • +5 ball goes off the mat	____/10 (hole shot)
	Additional Shots taken _____	____/55
Shot #3 – Robot is trying to get the ball into the hole. Points may be earned as follows: • Robot is in vertical position Robot may shoot the golf ball from one of the following three locations. Points based on where the shot is from, and how close they are to making it into the hole. May attempt from multiple locations but only highest points taken. • Location A: 30 points if golf ball stays in the hole, 20 points if stays on Green, 15 points if stays on the mat, 10 points if goes off the mat. • Location B: 20 points if golf ball stays in the hole, 10 points if stays on Green, 5 points if stays on the mat or goes off. • Location C: 10 points if golf ball stays in the hole, 5 points if stays on Green, 0 points if stays on the mat, but not on green, or goes off mat. • Minus 1 point for each shot attempted after the first shot.	+15 Robot Vertical +30 max Location A +20 max Location B +10 max Location C	____/15 Vertical Robot ____/30
	Additional Shots taken _____	____/45
	Points Awarded for this task	___/150

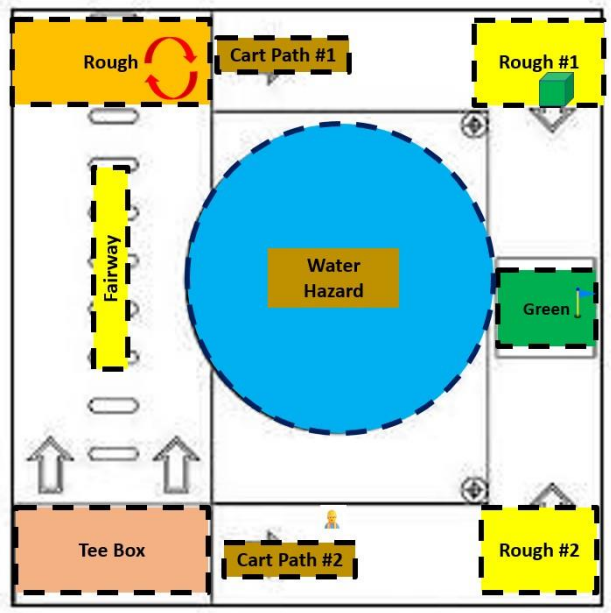
Task 4 – Playoff Round (Middle School Bonus Task with Text-Based Coding)

Procedure for this task:

This task may only be attempted using Text-Based coding. There is no time limit, as all-time would have been used during Task 3, but you also only get 1 attempt at this task and all points will be totaled, so you will want to let the robot run the program and earn as many points as possible.

You will also be given the option to run this task before Task 3, since you may need to modify your robot for the shooting portion of that task. If you select to run this task first, you must let the judge know that before you start Task 3. The time left will roll over to Task 3, after you complete this task.

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Playoff Round

This is a text-based round, and the robot only is allowed one attempt, so let the robot run the course.

Be sure to place the hole for the golf shot.

You may also run this task before Task 3.

Course Key			
	Tree	EV3 Cuboid	
	Equipment	Red Line	
	Hole	Yellow Line	
	Caddy	Barrier	

Task	Possible Points	Score
Robot starts with both wheels in the Tee Box and travels thru the Fairway	+10	____/10
Stops at Rough and performs a 360-degree spin.	+10	____/10
Travel through Cart Path #1 at a reduced speed and stop at Rough #1.	+10	____/10
At Rough #1, a golf ball should be set up. Can be a block, ping pong ball, or cotton ball. The robot should hit the ball in some way towards the Green.	+10 hit towards hole +5 makes it in the hole	____/15
After hitting the ball, the robot should drive through the Water Hazard and stop to pick up their Caddy at Cart Path #2	+10 Drive through Water Hazard +5 Touch the Caddy	____/15
Return to the Tee Box with the Caddy and one wheel inside the box.	+10 One wheel inside the Tee Box +5 Caddy brought back to the Tee Box	____/15
Penalty points: -5 for both wheels off mat		____
	Points Awarded for this task	___/75