



Game Related Activities & Skills

Beneficial Skills Beyond Simple Driving

Description: Mastering these baseline skills will improve your game play and help with your game strategy

Goal #1: – For both demo bot and create robot start away from a wall or a box and drive straight at it until a touch sensor indicates you have hit the object then stop.

Goal #2: – For both demo bot and create robot, start away from a wall or a box and start driving at an angle to the wall or box. Stop when the object is sensed and then square up to the object using touch sensors.

Goal #3: Mat A – For both demo bot and create robot start between the yellow and blue garage and drive towards the black starting line stopping when you sense it using reflectance sensors

Goal #4: Mat A – For both demo bot and create robot, start on the blue garage and drive towards the word “start” in the starting box (driving at an angle to the starting line) stop when the line is sensed and then square up to the line using reflectance sensors.

Goal #5: Mat B – For both demo bot and create robot follow the line on the mat from the start to the finish

Goal #6: – For both demo bot and create robot write functions that produces precise clockwise and counterclockwise 90° turns $\pm 3^{\circ}$.

Goal #7: – Write a function that allows you to move a servo as slow or as fast as you choose.

Connections to the Game Board

Description: Build and attach a custom piece to your DemoBot build that will allow you to successfully bulldoze or pick up and transport game pieces to specified areas on the mats.

Goal #1: Mat B – Place a row of alternating red and green poms along the center blue line spaced ~6” apart.

1. Push them off the blue line
2. Push them into a pile at the end of the mat

Goal #2: Mat B – Place a row of alternating red and green poms along the center blue line spaced ~6” apart.

1. Push just the green or red poms off the line
2. Sort and push poms into two piles at end of mat, one red and one green.

Description: Navigate to and manipulate game pieces using a claw and servos.

Goal #1: Mat A – Place three 3” yellow foam cubes along the back of the green box (solid green line circle #5 to #7) Bring the cubes back and place them on the solid black line on the starting box.

Goal #2: Mat A – Place two 3” yellow foam cubes along the back of the green box (solid green line circle 5 to 7) Bring the cubes back and stack them on the solid black line of the starting box.

Goal #3: Mat A – Place two each of 3” yellow foam cubes stacked along the back of the green box (solid green line circle 5 to 7) Bring only the top cubes back and stack them on the solid black line of the starting box.

Goal #4: Mat A – Place two each of 3” yellow foam cubes stacked along the back of the green box (solid green line circle 5 to 7) Bring the top cubes back and stack them on the solid black line of the starting box. Then bring the bottom cubes and stack them on the solid black line of the starting box.

Description: Navigate to and manipulate game pieces utilizing sensors and motor position counter.

Goal #1: Mat A – Place a stack of two, 3” blocks on circle 4, 6, or 9. Starting in the start box, drive forward until the cube is sensed and then stop within 3” without touching it. *Bonus: Adding to the previous program, once the cube is sensed, pick it up and navigate back to the start box.*

Goal #2: Mat A – Set a 3” block on coordinates A12. Driving using motor position counter, pick up the 3” block and set it in the yellow garage. Robot or game pieces may not cross solid lines of targeted garage. *Bonus: Set 3” blocks on A6, A12, and A18. One by one pick them up, and then stack them in the yellow garage.*

Description: Write some custom function to navigate the robot using motor position counter. All movement must be completed using your custom functions.

Goal #1: Mat A– Drive around the green garage and return to the start box. *Bonus: Place a 3" block on circle 7. Adding to the previous program, once the cube is sensed, pick it up and navigate back to the start box using the same parameters except deposit the block in the start box.*

Goal #2: Mat A– Start in the start box and navigate to, and park, in the orange garage. No part of the robot may cross the solid boundaries of the orange garage.