FIRST® LEGO® League

TUTORIALS

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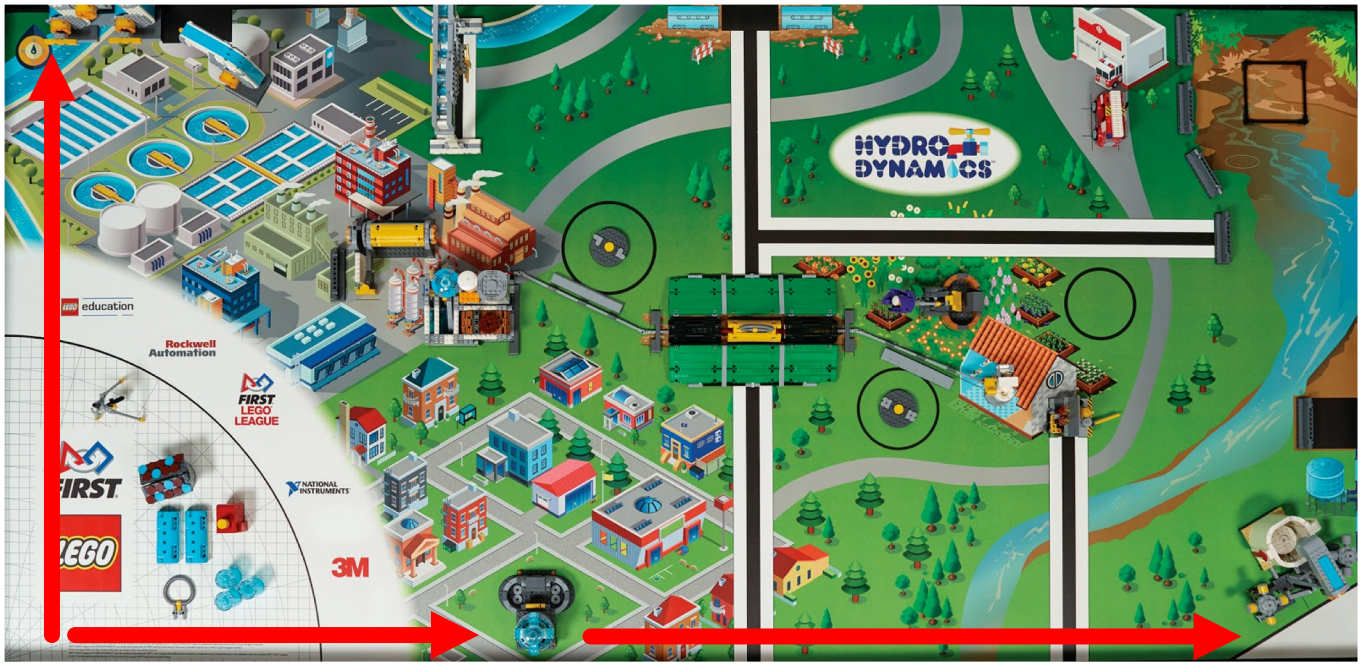
LESSON 5:
WALL FOLLOWING

SESHAN BROTHERS

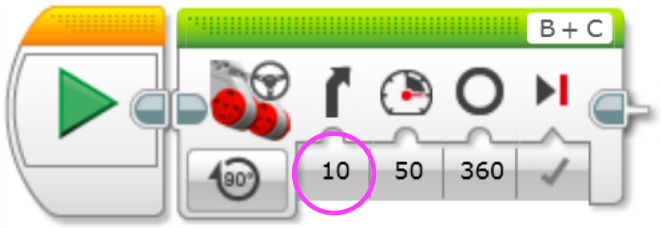
WHAT IS WALL FOLLOWING?

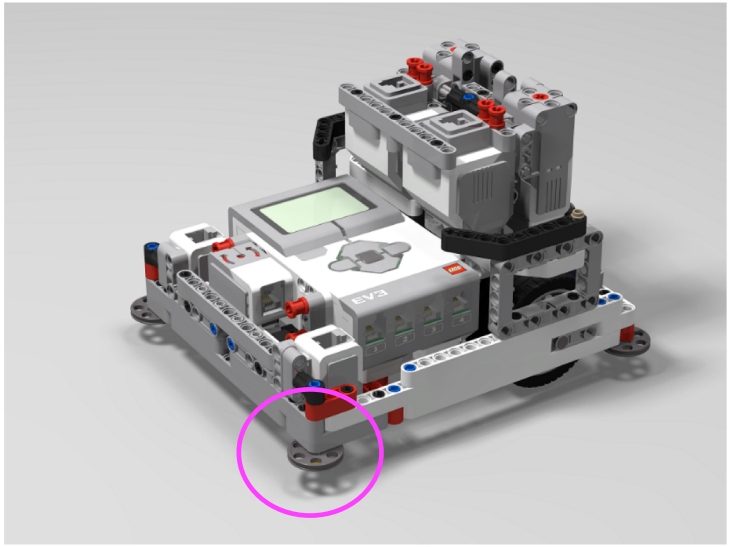
- Wall Following is when your robot moves along the wall
  - This helps ensure that your robot moves straight
- On many FIRST LEGO League fields you might find that the layout is open enough to ride the wall/follow the wall.



STAYING ON A WALL

- Wall Following can be accomplished with both programming and building techniques.
- In programming, you can set the steering block slightly positive or negative so that the robot will curve into the wall while moving forward.
- In addition, wheels can be used to smoothly ride along the wall.
  - This is may be especially critical if the table walls have rough paint or imperfections (wood knots, screw holes, etc.)

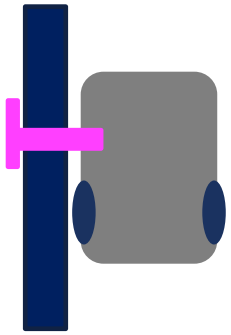


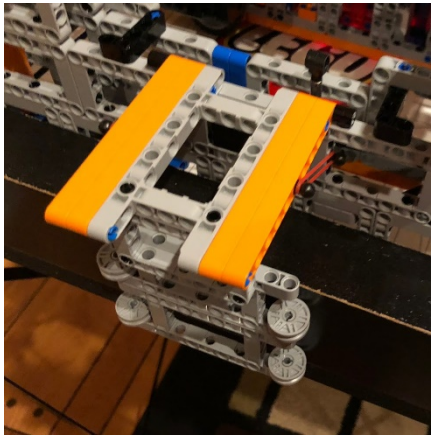


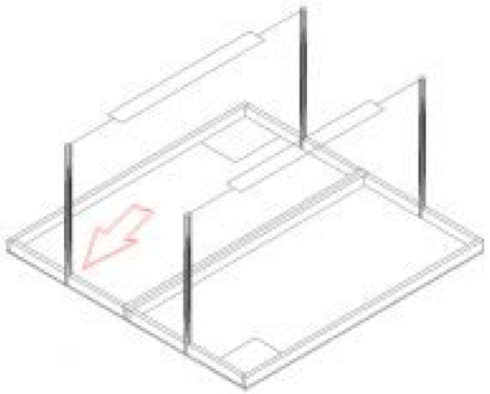
STAYING ON THE WALL, CONTINUED

- Teams have the option of building an arm or clamp that holds on to the wall as it rides it
- **Pros:**
  - The robot will reliably stay along the wall
- **Cons:**
  - The rules usually require that the robot stay in base at launch (inside the walls)
    - The arm must extend only after launch, thus requiring a passive or motorized mechanism to drop later
  - The rules in some years have required that the robot not be past base even on the return
    - Therefore the robot may need to bring the arm back up
  - Some venues have poles that would prevent your robot from riding the wall
- **Note:**
  - Make sure that it will work for both 2.5 and 3.5 in wall heights

Arm that drops and clamps on to wall







MOVING AWAY FROM THE WALL

- Depending on the direction of the robot when turning off a wall, different techniques must be used
- In the situation in Figure 1, when the robot tries to move off the wall, the rear of the robot will hit the wall.
  - Programming Solution: Make the robot curve off the wall smoothly instead of doing a sharp turn
  - Building Solution: Add small wheels to make the connection between the wall and the robot more smooth
- In the situation in Figure 2, a sharp turn will work because the rear of the robot is turning off the wall.

Figure 1

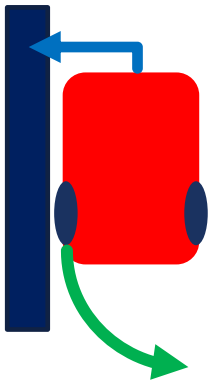
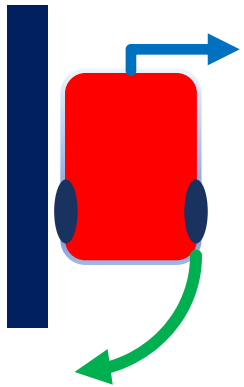


Figure 2



WHAT'S NEXT: APPLY THESE TECHNIQUES

CREDITS

- This tutorial was created by Sanjay Seshan and Arvind Seshan
- More lessons at www.ev3lessons.com and www.flltutorials.com