

Basic Training



Names: _____

Box Number: _____

Completed Missions:

M1	
M2	
M3	
M4	
M5	

M6	
M7	
M8	
M9	
M10	
Test	

**Build a vehicle using the
EV3 brick, two large
motors, two wheels and
the ball wheel.**



Mission 1

Regular:

Program your robot to move the left wheel for 3 seconds.

Completed:

Signed: _____

or

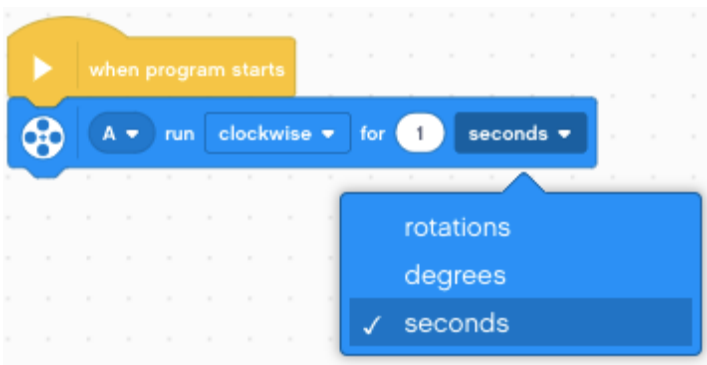
Advanced:

Program your robot to move the right wheel so your robot spins around back to where it started.

Completed:

Signed: _____

Hint:



Mission 2

Program your robot to move forward for 500 degrees at a 40% speed.

Completed:

Signed: _____

or

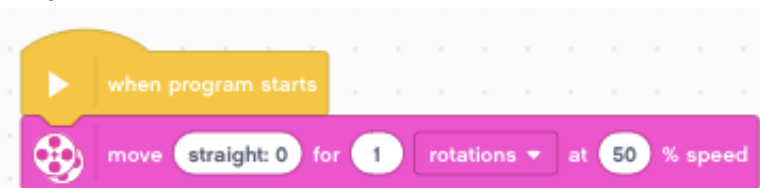
Advanced:

Program your robot to move forward for 3 rotations then backwards for 2 seconds at 40% speed.

Completed:

Signed: _____

Hint:



Mission 3

Program your robot to travel in a zig-zag pattern (left then right) 3 times at any power. (You may use a loop).

Completed:

Signed: _____

or

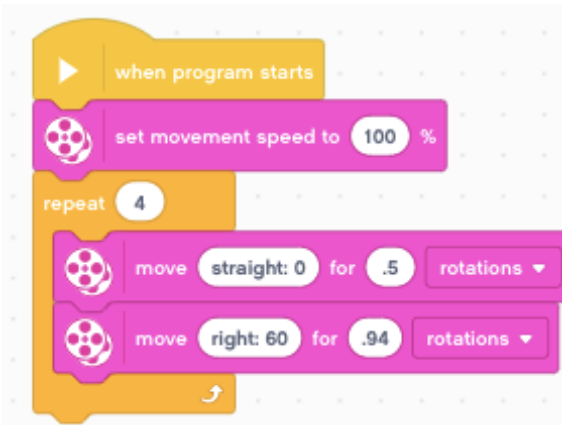
Advanced:

Program your robot to drive in a square formation so it finishes back where it started (30cm each side).

Completed:

Signed: _____

Hint:



Mission 4

Program your robot to display an image of eyes on the display for 3 seconds and then bark like a dog.

Completed:

Signed: _____

or

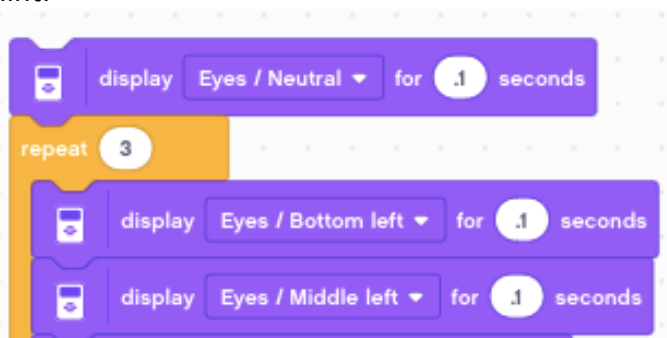
Advanced:

Program your robot to roll its eyes in a circle. At the same time play a sound.

Completed:

Signed: _____

Hint:



Congratulations on making it this far. Time for an upgrade.

Make sure you have an ultrasonic sensor, colour sensor and touch sensor attached (plug into numbers).

Ultrasonic



Colour



Touch



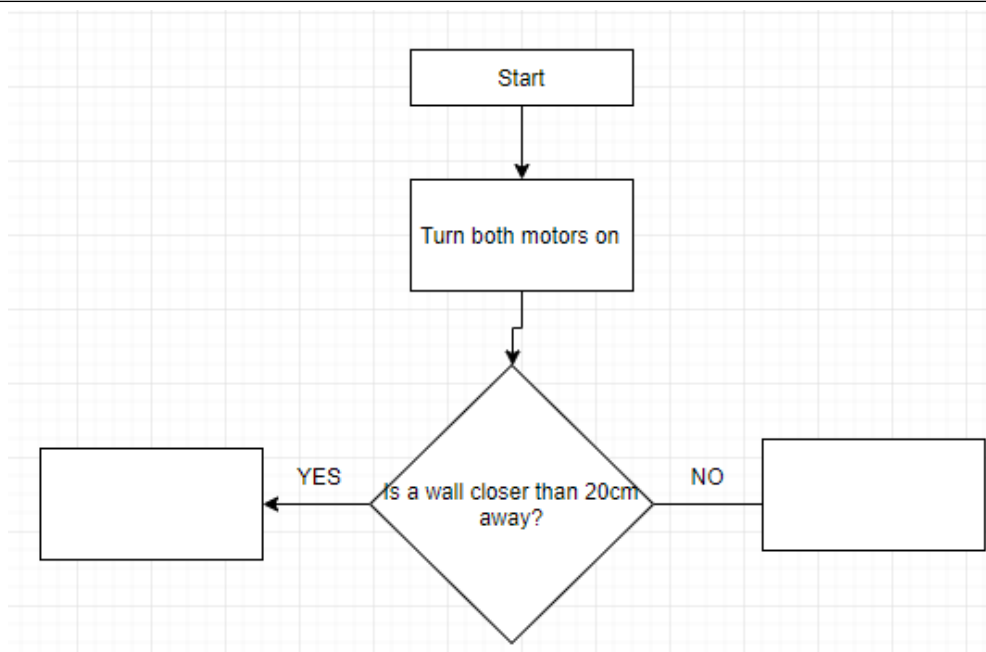
Mission 5

Program your robot to drive forwards for unlimited time until it sees a wall 20cm away, then stop. You can choose the speed.

Completed:

Signed: _____

Fill in the flowchart to match your program.



Hint:

The hint shows a sequence of Scratch code blocks. It starts with a yellow 'when program starts' block. Below it is a pink 'start moving' block with 'straight: 0' and '5 % speed'. To the right is a yellow 'when distance is' block with '4' in the dropdown, 'less than (<)' in the dropdown, '20' in the input field, and 'cm' in the dropdown. Below this is a pink 'stop moving' block.

Mission 6

Program your robot to drive forward for 3 rotations if you press the touch sensor.

Completed:

Signed: _____

or

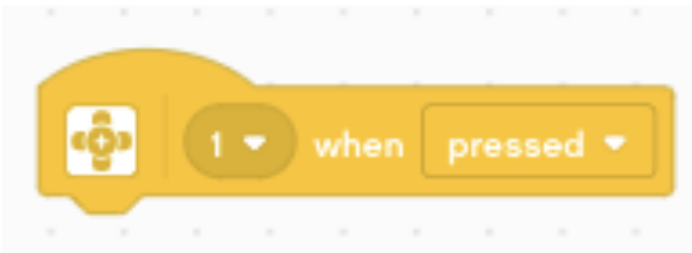
Advanced:

Program your robot to drive forward when you hold down the touch sensor and then stop when you release it continuously.

Completed:

Signed: _____

Hint:



Mission 7

Program your robot to drive forward until it sees a black line, then stop.

Completed:

Signed: _____

or

Advanced:

Program your robot to drive forward until it sees a black line, then reverse until it sees a green line, then stop.

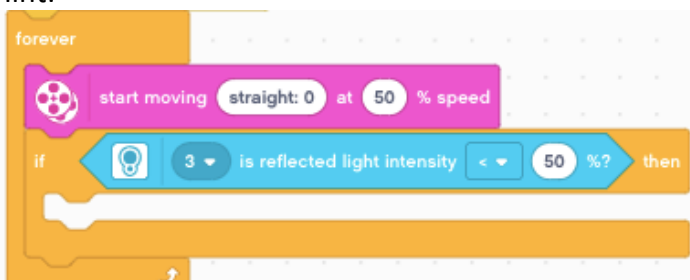
Completed:

Signed: _____

Remember

- Pure white is 100% reflected light intensity and
- Pitch black is 0% reflected light intensity

Hint:



Mission 8

Program your robot to turn 90 degrees to the left using the gyro sensor, then 90 degrees to the right.

Completed:

Signed: _____

or

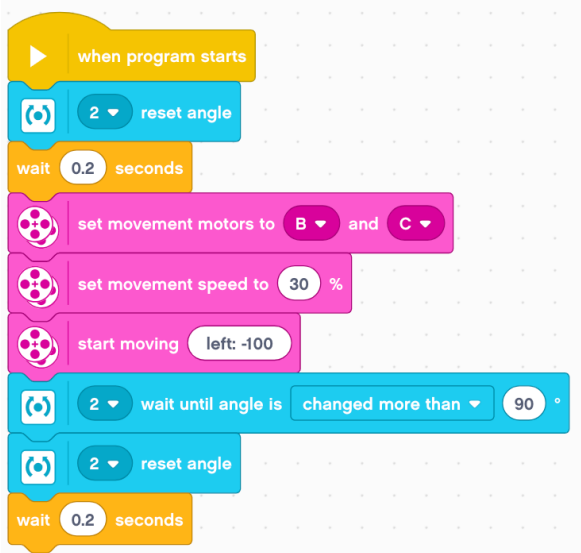
Hint:

Advanced:

Program your robot to turn 90 degrees to the left using the gyro sensor while displaying a left arrow, then 90 degrees to the right while displaying a right arrow.

Completed:

Signed: _____



Add a gyro sensor.



Mission 9

Program your robot to follow a black line around a circle.

Completed:

Signed: _____

or

Advanced:

Program your robot to follow a black line around a circle and stop when it is 5cm from an object.

Completed:

Signed: _____

Hint:

Proportional Line Follower

50 is the value of light, when the sensor is half over black and half over white. This number will change depending on the lighting conditions of the room.

when program starts

forever

start moving

1 reflected light intensity - 50 * 2 at 30 % speed

repeat until

4 is distance 5 cm ?

Mission 10

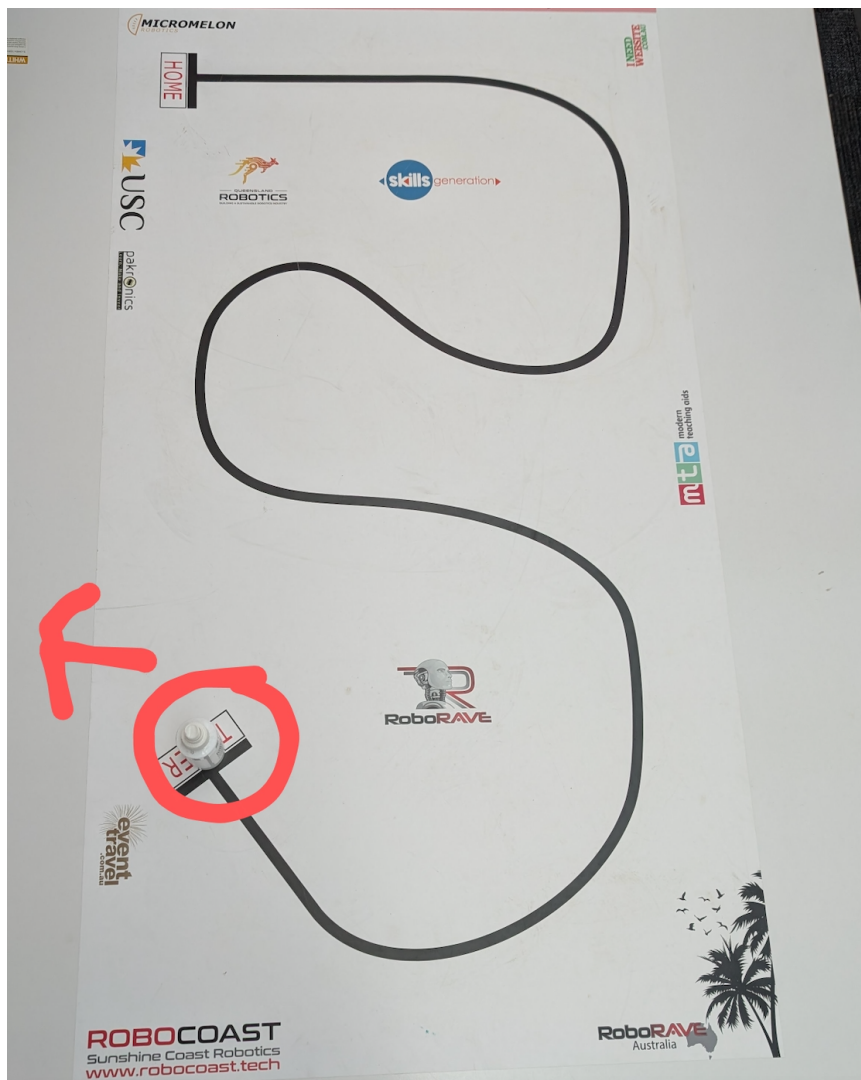
It's time to secure the medical supplies!

Start at home, follow the black line and push the medial supplies completely off the mat.

Completed:

Signed: _____

Teacher signature required for this mission.



Basic Training Test

Program your robot to move forward for 3 rotations at 100% power. Then move in a zig-zag pattern 3 times at 50% power. Wait for 1 second then drive forwards for an unlimited time at 30% power until you are 20cm from a wall. Reverse until you see a black line then stop.

Completed:

Signed: _____

or

Advanced:

Program your robot to move forward for an unlimited time at 50% power until you are 10cm from a wall. Then reverse until you drive over a green line and then stop at a black line. After seeing the black line, wait 1 second then turn 90 degrees and drive forwards until the touch sensor is pressed. When the touch sensor is press, stop the motors, display an image of a lightning bolt, and play a sound.

Completed:

Signed: _____

This must be checked of by Mission Control (your teacher).

**If successful, you are now ready to design and build a sumo robot
GOOD LUCK SOLDIER!**