FIRST LEGO LEAGUE - Ontario

Activity Sheet	
Gr 6 - Lesson #5	Stop at Angle – Accurate Means
Date:	Name(s):

Check That I'm Done ☑		
☐ Commented on my code	☐ Modify it task	☐ Coding Challenge

Learn

The mean (or average) of a set of numbers is the sum of all the numbers divided by how many numbers are in the set. For example, the set of numbers {4 6 3 5} is (4+6+3+5)/5 which equals 4.5. The number 4.5 now represent the whole set, with just one number. It doesn't however tell us how varied the numbers are.

Means can be very useful for many applications. One important application is in scientific measurement.

Errors add up…Imagine a meter stick company made meter sticks that were slightly too short. Perhaps even a fraction of a millimeter. Measuring that error with normal tools would be quite difficult. But using *means* you can do it quite easily. By measuring several lengths of the meter sticks, end to end, the difference begins to magnify. For example, 10 of these rulers may be 9.98m long (2cm shorter than it should be). Finding the mean length (0.998m), can give us a very accurate number for this ruler and show us that it's precisely 0.002m (or 2mm) too short.

Phone: 905.604.8445
Email: info@logicsacademy.com
Website: www.logicsacademy.com

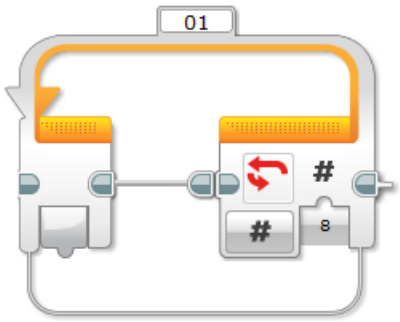
FIRST LEGO LEAGUE - Ontario

Predict and Plan

Every robot is unique. Based on your testing so far, how far about does a 90º change in the gyro sensor actually cause the robot to turn? _____º
Use your paper protractor to measure.

Demonstrate/Design/Discover

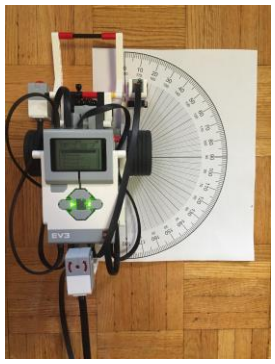
- ✓ Create a program that rotates in place slowly (~10% power) until a change of 90º is measured by the gyro sensor. After the angle is reached, have the robots motors stop for half a second to have it settle.
- ✓ Put all of this inside a loop block so you can choose how often it repeats.
- ✓ Change the setting on the loop block so it repeats 4 times (instead of forever)



Tips: Its ok that it doesn't turn exactly 90º yet

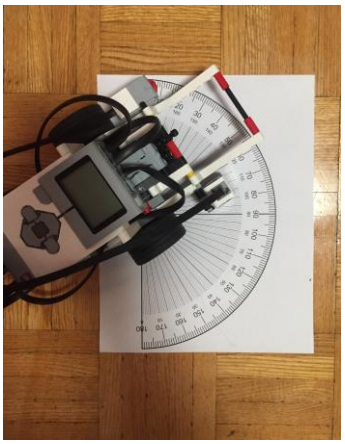
Record

Place your robot on the protactor provided as show in the picture below.
Notice the edge of the arm is lined up at the 0º mark.
Run your program which will make the 90º turn 4 times.
Ideally, your robot would be exactly where it started,
as 90 x 4 = 360 (or a complete circle). There will
however be some error. Fill out the entire chart below.



Phone: 905.604.8445
Email: info@logicsacademy.com
Website: www.logicsacademy.com

Number of 90⁰ Turns (loop #)	**Angle Error** (measured away from 0)	**Mean** (Average angle error per turn)
4		
8		
12		



Instead of a 90º change value in the code, turn value to a number that you think will create a more acurate 90º turn. Use the numerical data above to do this.

I chose _____º instead of 90º.

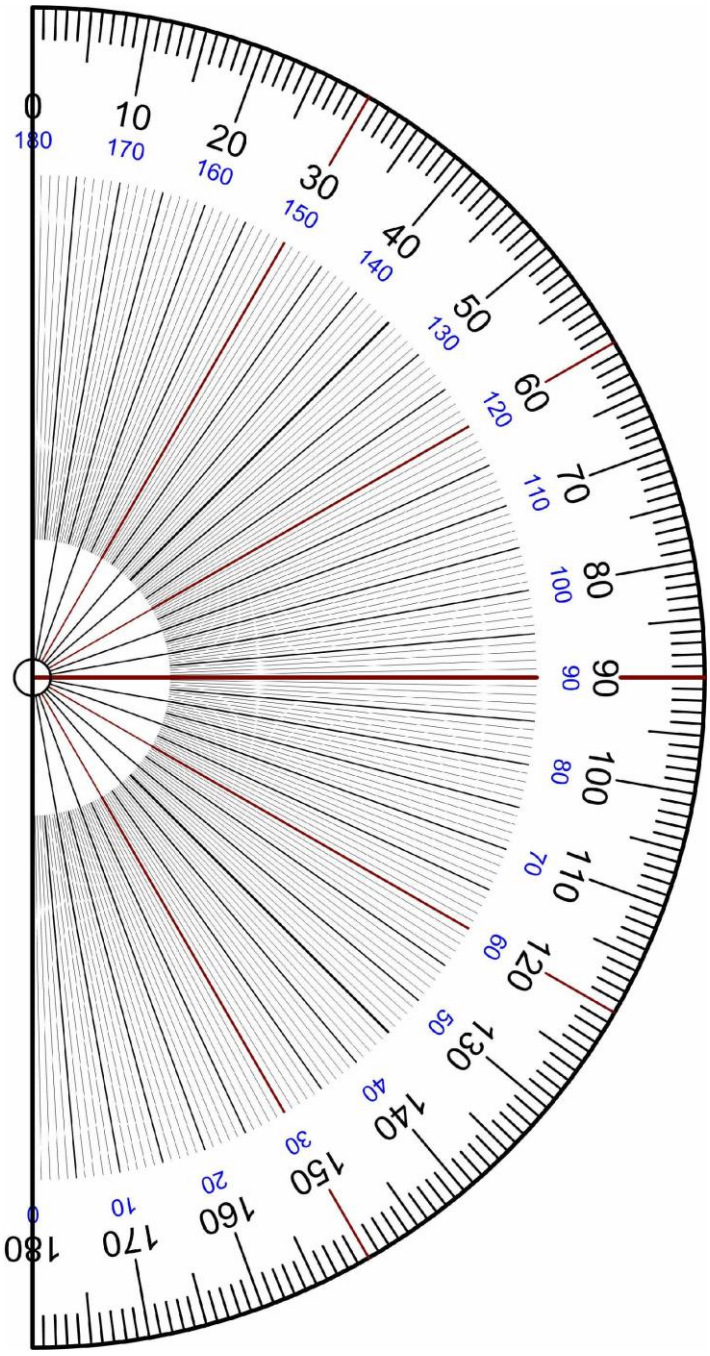
Run the last test again with your new and improved value and fill out the chart below.

Number of Turns (loop #)	**Angle of Error** (measured away from 0)	**Mean** (Average error angle per turn)
12		

Phone: 905.604.8445
Email: info@logicsacademy.com
Website: www.logicsacademy.com

…a playground for innovative minds

FIRST LEGO LEAGUE - Ontario



Phone: 905.604.8445
Email: info@logicsacademy.com
Website: www.logicsacademy.com