

FIRST LEGO LEAGUE - Ontario

Activity Sheet	
Gr 8 - Lesson #4	Stop at Object – Discrete Sound Tracing
Date:	Name(s):

Check That I'm Done <input checked="" type="checkbox"/>		
<input type="checkbox"/> Commented on my code	<input type="checkbox"/> Modify it task	<input type="checkbox"/> Coding Challenge

Learn

There is an important difference between discrete and continuous data.

Discrete data is **EXACT**, and is usually **counted**. It can only have certain values, and is considered perfectly accurate. For example, counting students in your classroom. You can have exactly 24 students, but cannot have 24.28 students.

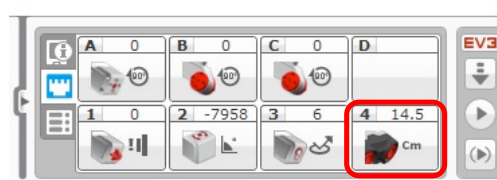
Just ask yourself, can you count them in a tally.



Continuous data, is just that, continuous. It can take any value, but then you must ask yourself how accurate the number is. This usually comes from **measuring** something.



The information coming into EV3 brick from the ultrasonic distance sensor is continuous. It is rounded and displayed as the nearest tenth of a centimeter on your computer screen (bottom left) or on the port view option on your brick.

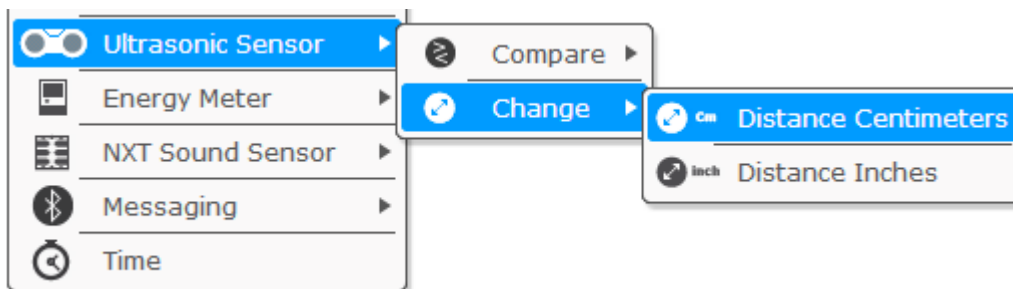


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Often in robotics it's important to make data more discrete by splitting it into sections, so you can make rules for each section. There are several ways to do this.

Predict and Plan

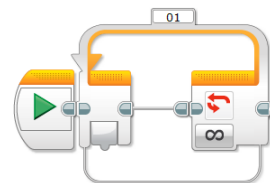
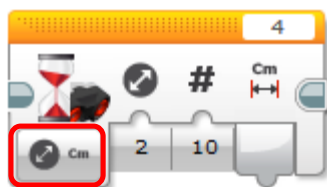
While programming the ultrasonic sensor earlier (using the wait block), you noticed you can either compare if something is close or far, or measure a change in distance.



Explore this 'change' setting for 2 minutes with your partner.

Demonstrate/Design/Discover

- ✓ Locate the "wait block" and the "loop" found in the orange tab.

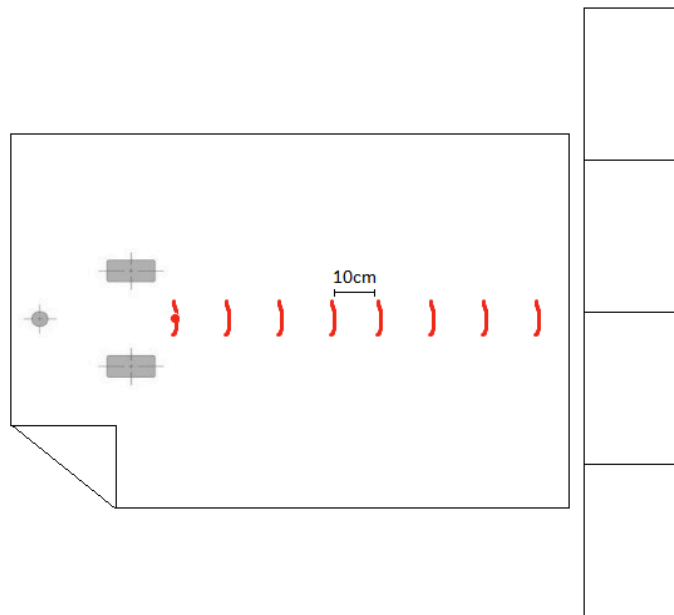


- ✓ Set the wait block to measure change. Your program will use these blocks to split up a meter into 10 discrete equal length sections.
- ✓ Create a program that automatically drives back from the wall until the sensor detects a change of 10cm and then lowers the marker using the medium motor attachment, and draws a line.

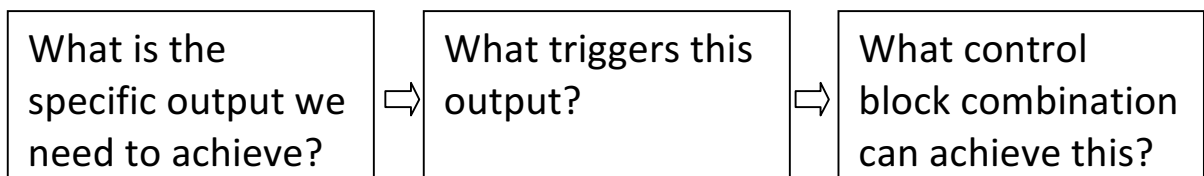
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- ✓ Test and program the marker drawing feature separately.
- ✓ GO SLOW and use lots of wait blocks to let the robot settle. You need only to write code for this once, and then put it all in a loop block so the process repeats. Use chart paper so you don't get marker on the floor.

It should look something like this:



- ✓ Before jumping right into coding, breaking down your process into smaller chunks makes it much less confusing. Below is an example flow chart to help out. Use these in the future when solving tough challenges.



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Record

Using a ruler and measure the actual distances between the marks and the wall. Record them below.

Marker Line	Theoretical Distance (sm)	Actual Distance (cm)	Error (cm)
1	10		
2	20		
3	30		
4	40		
5	50		
6	60		
7	70		
8	80		
9	90		
10	100		

Plot the "Error Vs. Marker Line" on a chart below.



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