Robot Class

# Finishing the build

The robots will be partially built in order to spend more time on discussing their functionality and running test code via Makeblock’s mBloc (based on Scratch 2.0).

The first part of the session, we will install the boards and wire the robot.

Connecting to the robot

Make sure Computer's Bluetooth is turned on.

We are going to program and control our robot from mBlock.

In mBlock go to Connect > Bluetooth > Discover

Machine generated alternative text:
c - Based On 
Connect Boards 
Serial pot 
24G Serial 
Firmware 
Upgrade Firmware 
Reset Default program 
Vlew Source 
Install Arduino Dover 
Lang u._ 
Discover 
Clear Bluetooth 

Find your robot's MAC address and click it

Machine generated alternative text:
Click De 
Makeblock ( 

This will connect the robot to your computer and the mBot program

Make sure that under the Boards menu, Me Orion is checked.

Machine generated alternative text:
Boards Extensions 
Arduino 
Arduino Uno 
Language 
Help 
Arduino Leonardo 
Arduino Nano ( meqa37R ) 
Arduino Mega 1280 
Arduino Mega 2560 
Makeblock 
Me Orion 
Me BaseBoard 
Me UNO Shield 
m Bot 
Others 
PicoBoard 

Test motor connections

Machine generated alternative text:
when 
clicked 
set motor speed 
set motor speed 

If you are wired properly, your right wheel/track will move forward

To test the left wheel/track change motor to "M2"

Test Ultrasonic Sensor

Since we need to output the response of the sensor, we will use M-Panda to help us.

Using this block:

Machine generated alternative text:
when 
dick ed 
love robotics' 

M-Panda Shows:

Machine generated alternative text:
I love robotics! 

In order to show our sensor reading, we replace our text with the Ultrasonic Sensor block from the Robots category

Machine generated alternative text:
when 
fore 
clicked 
say ultrasonic sensor distance 

1/21/2016 4:03 PM - Screen Clipping

Our result (in centimeters):

Machine generated alternative text:
31.103 
0.0 

# Let’s explore!

Now that we know how to connect and send commands to the robots, we can build on top of that and explore using other program blocks to control our robots.

## Events

Events in mBlock uses action to run a set of code contained within them.

The test code above used an event to trigger our code whenever the green flack was clicked.

Other examples and pressing and releasing a key, or clicking an image or sprite.

## Control

The control blocks are used to help program logic into the code. While loops, Waits, If…Then, all take a parameter (except forever, which is an infinite loop) that will execute the code within it as long as the control is still valid.

Example: if you use a Repeat block with a parameter of 10, the code will run is sequence 10 times before stopping. This is called a While Loop, here is the loop written in Javascript.

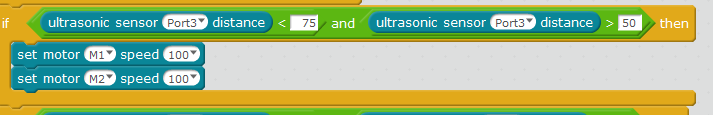
while (i < 10) {  
    text += "The number is " + i;  
    i++;  
}

## Operators

Operators return a value based on the type of block and its inputs.

Several of the blocks are for comparison and return a Boolean value (i.e. true or false).

Here is a block I wrote the uses the Ultrasonic sensor to determine the speed and direction I wanted the robot to move:



As you can see, I used the Robot blocks to read and send instructions to my bot.

The operators are checking my distance and calculating if the bot is between 2 set distances.

Finally my control “If” is looking at the results of the operators, and executing my code if it is true, if it is false, then the program will move on to the next block.

 Now it is time for you to use these different tools and program your bot the way you would like it to respond to different situations.