How to Use RoboCar

1: Switch off RoboCar (red switch to 0).

2: Place robot on foam block (make sure wheels are off the table).

3: Plug Arduino into computer.

4: Edit and upload your code.

5: Unplug RoboCar, place on the ground with plenty of space, and switch on.

The Code

```
//************* STUDENTS USE THIS PART BELOW ONLY *****************

void loop() {
  alert();
  drive(forward,10);
  while(1);
}
```

Change this bit.

Change the code by adding different commands for RoboCar, you can use the functions below. Try changing the numbers.

```
drive(forward,10);

drive(back,20);

turn(right,90);

turn(left,180);

alert();
```

Must be bigger than 10

Can be 1 to 180

Challenges 1-5:

1. Drive forward 30 cm and then make the robot beep
2. Make the robot drive around a square
3. Make the robot drive around a triangle
4. Make the robot drive around a triangle, and then reverse the same path.
5. Make the robot drive in the shape of the first letter of your name.

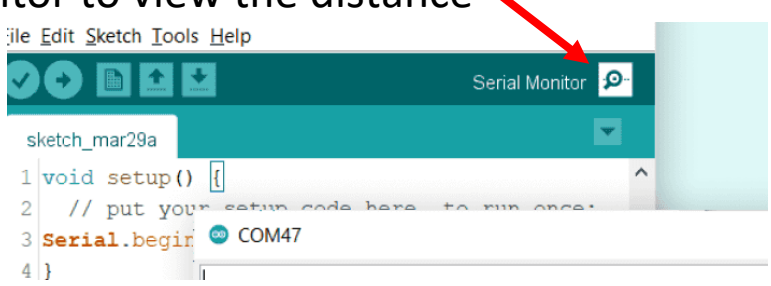
Using the Sensor:

Robocar has an ultrasonic range sensor, like we used in the last class. Use the code below to and measure the distance

```
//************* STUDENTS USE THIS PART BELOW ONLY *****************

void loop() {
  alert();
  float distance = scanAhead();
  Serial.print("Distance (cm) is: ");
  Serial.println(distance);
  while(1);
}
```

Use the serial monitor to view the distance



if statements:

"if" statements, are chunks of code that will only run "if" some condition is met

```
//************** STUDENTS USE THIS PART BELOW ONLY *****************

void loop() {
  alert();
  float distance = scanAhead();
  if (distance>10){
    drive(forward,10);
  }
}
```

This line will only happen if the distance measured by the sensor is greater than 10

Challenges 6-9:

6. Make the robot beep if there is something less than 20cm in front of the sensor

7. Make the robot drive forward if there is 20cm space in front, if there is an obstacle less than 20cm away, make the robot reverse.

8. Make the robot drive forward if there is no object within 20cm, but if there is an object less than 20cm make it turn right.

9. Make the robot drive around and automatically avoid obstacles using the distance sensor

for loops:

for loops can be used if you have some instructions that you want the robot to repeat a number of times

This uses a for loop

```
//************* STUDENTS USE THIS PART BELOW ONLY ****************

void loop() {
  alert();
  for (int i = 0; i < 3; i++) {
      drive(forward,10);
      turn(right,90);
  }
  while(1);
}
```

These lines will be repeated 3 times

Challenges 9-11:

10. Using a for loop, make the robot turn right and then beep 8 times in a row

10. Make the robot drive in a triangle using a for loop

11. Make the robot drive in a large circle

If you've finished all the challenges, ask for some tape and make a racetrack or obstacle course on the ground, challenge a friend to program their robot to drive around the track!