ARTBOTICS

Programming with Arduino

Driving and Drawing
Arduino

Microcontroller with additional components called “shields” stacked on top
Arduino Uno

Microcontroller that controls lights, motor, sensors, and additional shields.

- **USB Port**
- **Power socket**
- **Reset button**
- **On/off switch**
- **Battery pack**
Arduino Motor Shield

Attaches on top of Arduino Uno, controls DC motors

Reset button

Motor B

Motor A
Arduino IDE

Integrated Development Environment (IDE), used to program the Arduino

Editor: where you type your code

Console: notes any errors when compiling

Type of Arduino and serial port it is connected to
Arduino IDE

Integrated Development Environment (IDE), used to program the Arduino

- **Verify**: checks your code for errors
- **New**: start a new file
- **Save**: save your current file
- **Upload**: sends your code to the Arduino
- **Open**: open a saved file
- **Serial monitor**: read and write data to and from your Arduino
Artbotics Arduino Library

- The Arduino can use pre-defined code and functions called a “Library”, which is imported using the code `#include <LibraryName.h>`

- We have developed our own Artbotics library that makes it easier to program

- `#include <Artbotics.h>`

- Be sure to include this in every program you write during this workshop!
Uploading to the Arduino

- To upload your code to the Arduino, make sure that:
  - The USB cable is plugged into your computer
  - The USB cable is plugged into the Arduino Uno
  - The battery pack is switched OFF

- Press the verify button to compile your code

- If there are no errors, press the upload button

- When the IDE is finished, unplug the USB cable from the Arduino
Running Your Program

- Once the Arduino is powered on it will automatically run the code that has been uploaded to it.

- Once your code has been uploaded, ensure the USB cable is unplugged and switch the battery pack ON.

- For the “Driving and Drawing” exercise, your car should start driving shortly after you switch the battery pack ON, so be careful to not let it drive off the table!
Driving and Drawing
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Driving and Drawing

• The “Driving and Drawing” handout has step-by-step exercises that will teach you how to control the car to draw patterns

• Exercise 6 is a quick reference for commands that can be used to control the car to produce different types of lines, curves, and shapes

• After you experiment with each type of command, try making your own custom drawing!

• **DO NOT DRAW ON THE TABLES!!!**
Driving and Drawing

Car car(pin, pin, pin, pin);

car.moveForward(duration, power);

car.backBackward(duration, power);

car.turnRight(duration, power);

car.turnLeft(duration, power);

car.arcRight(duration, power, arc);

car.arcLeft(duration, power, arc);

car.spin(duration, power, direction);