# HUMMINGBIRD®

ROBOTICS KIT

## USER GUIDE

BIRDBRAIN TECHNOLOGIES LLC

# WAIT!

**Before you turn the page...**

## HUMMINGBIRD BIT VIDEO COURSES

Access our **free** online professional development to learn the basics of **programming**, **building**, and **teaching** with the Hummingbird Robotics Kit!

**Visit these free courses at...**

birdbraintechnologies.com/hummingbirdbit/pd-course

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Hummingbird Bit controller, parts, user manual, and packaging made in China.

# SAFETY INSTRUCTIONS

- Hummingbird is an electronics and robotics kit intended for use by anyone 9 years of age and older.
- Do not touch or hold any Hummingbird moving parts while they are operating.
- Keep non-kit conductive materials away from the Hummingbird controller.
- Always turn off the Hummingbird controller when you are done using it. Do not leave the controller powered and unattended.
- Hummingbird parts should never be used in or near any liquid or in any extremely hot or cold environments.
- Discontinue use of any Hummingbird parts that malfunction.

This device complies with part 15 of the FCC Rules.

Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.


# A LETTER FROM OUR TEAM

In 2005, a team at Carnegie Mellon's CREATE Lab began working with kids and teachers to reimagine robotics as a tool for learning. One result of this work is the Hummingbird Robotics Kit, which has empowered many thousands of students to bring their ideas to life.

The power of the Hummingbird is in its flexibility - the same kit of parts can animate a poem, model the human arm, build an autonomous rover, or create a pinball machine. The Hummingbird Kit is designed to grow with kids (and adults) who may start out as absolute beginners, and to allow them to go deep in a wide variety of different ways - whether by creating beautiful electronic art, intricate cardboard mechatronics, or cleverly programmed robots.

We can't wait to see the creative robotics projects you are inspired to make with the Hummingbird!

Sincerely,

*The BirdBrain Team*

# QUICK START GUIDE

**1** Go to birdbraintechnologies.com, and click

**GET STARTED**

**2** Click on "**Hummingbird Bit**," choose your **programming device**, and choose your desired **programming language**.

**3** Click "**PROGRAM**" to find step-by-step setup tutorials.

**4** Explore our **Program**, **Build**, **Teach**, and **Resources** pages to make your own robot!
*(See pages 8-11 for a preview)*

**Get started on our website...**

birdbraintechnologies.com

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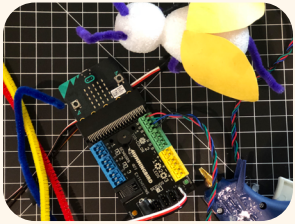
# QUICK TEACHING GUIDE

We want to make getting started with robotics as simple as possible! Introduce your students to programming and building with the Hummingbird using one of our First Hour of Robotics lesson plans.

## Included in the lesson plans:

Step-by-step instructions for teaching, suggested craft supplies, content connections, classroom management tips, and more!



**Print your First Hour of Robotics lesson plan at...**

birdbraintechnologies.com/hummingbirdbit/firsthour

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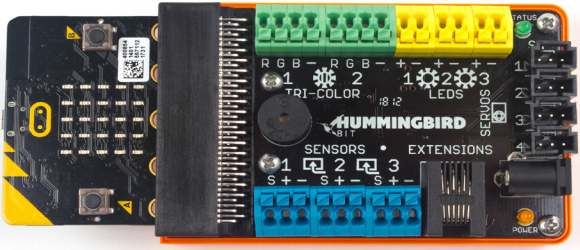
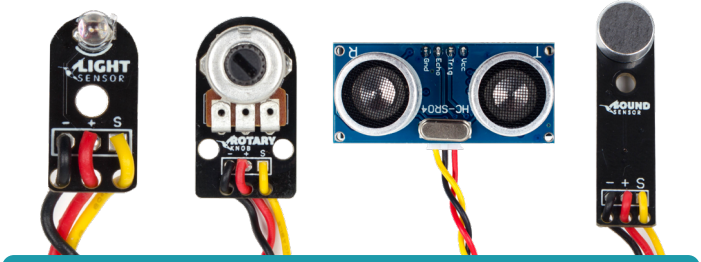
# KIT CONTENTS

## HUMMINGBIRD BIT CONTROLLER




## INPUTS




| Light Sensor | Dial Sensor | Distance Sensor | Sound Sensor |
|---|---|---|---|
| x1 | x1 | x1 | x1 |
| | | PREMIUM KIT | PREMIUM KIT |

# KIT CONTENTS

## OUTPUTS

Single Color LED
x3

Tri-Color LED
x2

Micro Servo
FS90 | x2

BASE KIT


Position Servo
FS5103B | x2

PREMIUM KIT

Rotation Servo
FS5103R | x2

PREMIUM KIT

## ALSO INCLUDED

Terminal Tool
x1

Battery Pack
x1

Servo Wheels
x2

PREMIUM KIT

Plastic Block Adapters x2

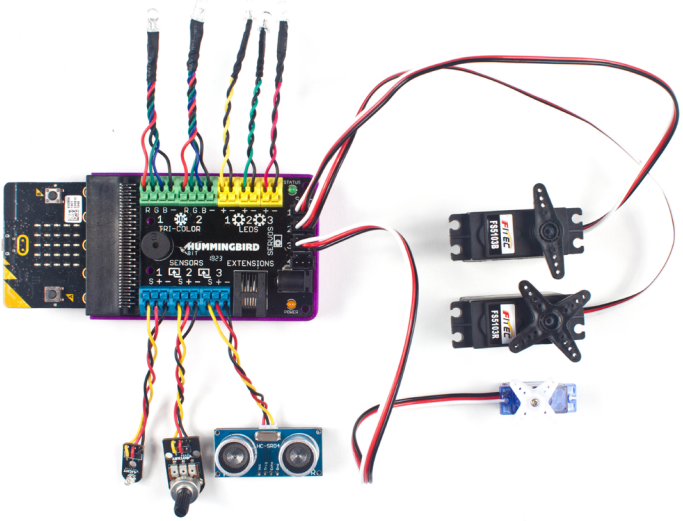
PREMIUM KIT

Extension Cables

BASE KIT x2
PREMIUM KIT x4
ONLY

# CONNECT

Each component connects to a different part of the board.




**To learn how to connect the lights, sensors, & motors to your Hummingbird board, visit...**

birdbraintechnologies.com/hummingbirdbit/connectingelectronics

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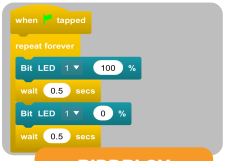
# PROGRAM

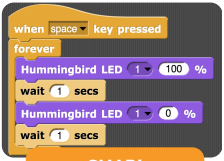
With the Hummingbird, you will write computer programs to control the lights, sensors, and motors of your robot.

We support a range of block-based and text-based programming options.




BIRDBLOX


MAKECODE




SNAP!

```
for i in range(10):
    hummingbird.setLED(1, 100)
    sleep(250)
    hummingbird.setLED(1, 0)
    sleep(250)
```

PYTHON

```
for (int i = 0; i < 10; i++)
{
    hummingbird.setLED(1, 100)
    sleep(250)
    hummingbird.setLED(1, 0)
    sleep(250)
```

JAVA

**For more details and getting started tutorials, go to...**

birdbraintechnologies.com/portal

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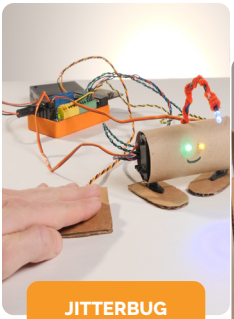
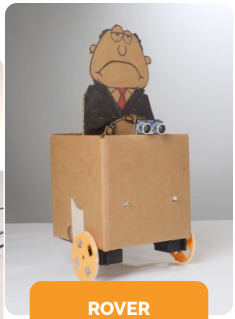
# BUILD

Use the Hummingbird Robotics Kit to bring a project to life using everyday craft materials. Visit our Build page to find creative ways to get started on your next robot.



JITTERBUG

BASIC MECHANISMS



ROVER

**For instructions and tips for building robots, visit...**

birdbraintechnologies.com/hummingbirdbit/build

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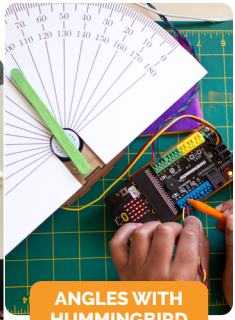
# PROJECTS

The Hummingbird allows for limitless creative possibilities, regardless of subject or skill level. See how you can integrate robotics into any content area on our Projects page.

MOVING MASTERPIECES

ROBOT SHAKESPEARE

ANGLES WITH HUMMINGBIRD

For more projects, visit...

birdbraintechnologies.com/hummingbirdbit/projects

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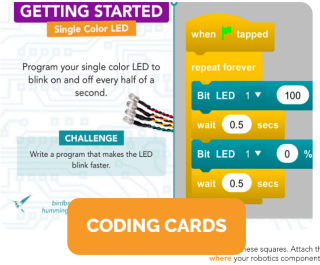
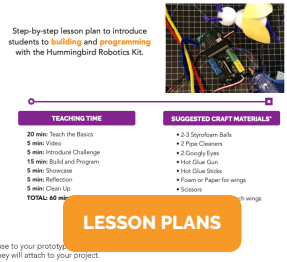
# RESOURCES

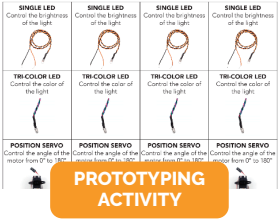
We want to make sure you have the tools you need to get started in your classroom. Our Resources page has free printable tools to integrate the Hummingbird into your curriculum.




CODING CARDS




LESSON PLANS




PROTOTYPING ACTIVITY

**For other printable instructional resources, visit...**

birdbraintechnologies.com/hummingbirdbit/resources

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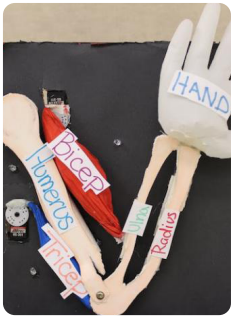
# FOLLOW

Follow us on social media and sign up for our newsletter for more robot inspiration!

@birdbraintech




**To get regular access to more curriculum ideas, go to...**

birdbraintechnologies.com/mailing-list-sign-up

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# SHOP

**For parts, accessories, and more visit...**

birdbraintechnologies.com/store

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