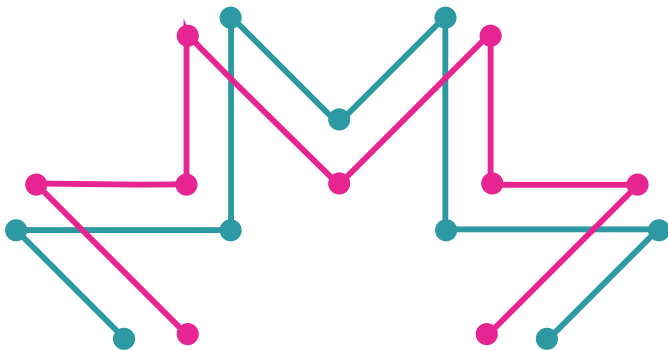# TECH TALES

MAKE. LEARN. SHARE.

Explore technology with your family! Learn about circuitry, robotics, and programming together—use old and new technology to bring your stories to life.

_____

name

Tech Tales Schedule

DAY 1: GET TO KNOW YOU
Get to know each other! Who is in your community? What do you think about robotics?

DAY 2: STORIES
Learn about energy and think about your family's stories.

DAY 3: INTRO TO ROBOTICS
Use new tools, old tools, and your creativity to tell your stories.

DAY 4: MAKING & BUILDING
Get fancy with it! Add new elements to your stories.

DAY 5: SHOWCASE AND CELEBRATION
Share your stories and what you learned, and celebrate your community!

Every workshop day will have four sections:

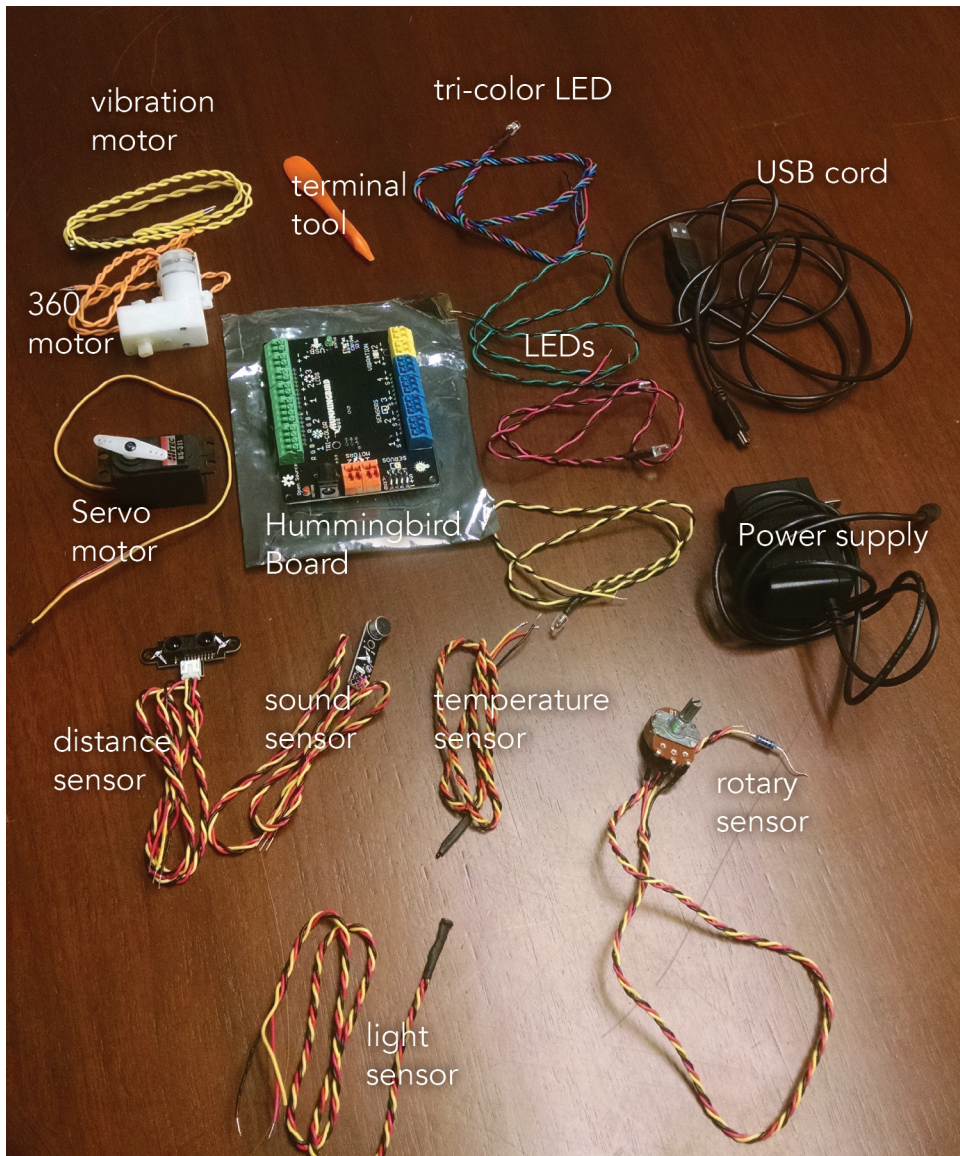**1. SHARING**

2. STORYTELLING

3. EXPLORING

4. ACKNOWLEDGING

There will always be food, and you can always take breaks if you need to.

HOME PLAY

There are optional activities to do at home with your backpacks in between workshop days. Find them at the end of this booklet.

HUMMINGBIRD ROBOTICS KIT

vibration motor

tri-color LED

terminal tool

USB cord

360 motor

LEDs

Servo motor

Hummingbird Board

Power supply

distance sensor

sound sensor

temperature sensor

rotary sensor

light sensor

For more information, go to
http://www.hummingbirdkit.com/about/kit-contents

CONNECTING ELECTRONICS

HUMMINGBIRD ROBOTICS KIT

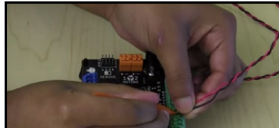TODAY WE'RE GOING TO GIVE YOU A QUICK TUTORIAL ON HOW TO CONNECT ELECTRONICS TO YOUR **HUMMINGBIRD DUO BOARD.**

THERE'S NO SOLDERING OR CRIMPING INVOLVED; THE HUMMINGBIRD DUO'S **TERMINAL BLOCKS** MAKE CONNECTING AS EASY AS PUSHING AND RELEASING.
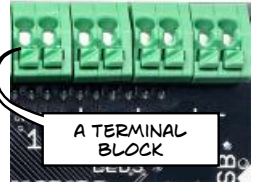
A TERMINAL BLOCK

JUST USE THE **TERMINAL TOOL** TO PUSH DOWN ON THE TAB...

INSERT THE WIRE INTO THE HOLE...

AND RELEASE! (IT'S GOOD TO GENTLY TUG ON THE WIRE TO MAKE SURE THAT IT'S SECURE)

Find the whole CONNECTING ELECTRONICS guide
on the Hummingbird website!

http://bit.ly/2p5CfIg

things to remember

Computer login:

_____

_____

Backpack number:

_____

Notes:

_____

_____

_____

_____

_____

sheet 1

Talk about these questions with your family

1

What kinds of things do people in our family make or build in our jobs or family life?

Examples: clothes, art, bikes, jewelry, or others!
Think about extended family too!

Do we think that the things our family makes is connected to robotics and computer science?

Engineers and computer scientists work in teams.
Please think about how your family works as a team by talking about the rest of the questions.

2

How do we work together as a family?

3

How do we help each other learn?

4

How do we make
decisions as a family?

5

How do we make sure we listen
to everyone's ideas?

sheet 2

TECH TALES STORYBOARDING
Pick the story you want to tell with your project

STEP 1: Pick your prompt!
There are three prompts to choose from to get you started:
1. Tell a story about an important experience in your family's past.
2. Tell a story about how your family and/or the world might change in 10 years.
3. Tell a story about a place that is important to your family.

STEP 2: Write a brief (2-3 sentence) summary of your story:

_____

_____

_____

STEP 3: From your story, pick ONE SCENE that you want to make into your project.
Some things to decide on: What is your setting? Where/when does your story take place?

_____

Who are your characters? What background elements do you want in your project?

Characters: Background elements:

_____   _____

_____   _____

_____   _____

STEP 4: Sketch the scene from your story.
Think about what parts you can have move.

sheet 3

TECH TALES DIAGRAMMING
Draw and label your project

Now that you know more about the robotics parts can use, it's time to design your scene and think what parts you want to use to make your scene come alive! This sheet will help you keep track of all of the parts you are building in your story.

Setting

_____

_____

**List all of the characters and background
parts that you'll use in your project.**

_____

_____

_____

_____

_____

_____

_____

Think about what robotic components you can use.

Choices are:

Single color LED

Tri-Color LED

Motor (360°)

Servo Motor (180°)

Vibration Motor

Sound Sensor, Light Sensor,
Distance Sensor,
Temperature Sensor,
Rotary Knob

Draw your design on the next page ->

SKETCH YOUR SCENE!

Label your diagram in whatever way makes the most sense to you.

Some suggestions: arrows to show movement, a small sun to show lights, letter "S" for sensors

diorama guidelines

Hummingbird
ONE INPUT component
(sensor or dial)
TWO OUTPUT components
(lights or motors)

Scratch
ONE EVENT block
(Example: when X clicked)
ONE CONTROL block
(Example: Repeat X times, Repeat forever,
Wait X seconds)

Story
A short written paragraph
in your preferred language

Your Story

_____

_____

_____

_____

_____

_____

_____

_____

final presentation

Final Presentation Directions

Each family will give a presentation of their projects. It's ok if your project isn't done! Your presentation is more about telling the story, talking about your process, and sharing what you learned.

THE FINAL PRESENTATION SHOULD HAVE:

1. Your diorama.
2. A short, written paragraph describing their story, and
3. Your plan for how you will share your story and diorama.

The presentation process

You will have about **5 minutes** to present to the group.
There will be **5 minutes** of questions from other families.

WHAT SHOULD YOU PRESENT?

1. **Your story!** Tell your story and explain why the story is important to you as a family!
2. **Explain your diorama.**
   a. Explain the parts and how you made them work.
   b. Share your challenges: What was hard to do?
   c. Share your successes: What are you most proud of?
3. **What do you want to build next?**

HOME PLAY

The following optional activities are for your family to do at home with your backpacks in between workshop days.

You are encouraged to take pictures of the work you do to share with the other families.

# home play day 1

OPTION 1:
SELF-DOCUMENTATION

What are your family's hobbies and what are you good at?
For each member of your family, take pictures of your individual hobbies and interests AND hobbies that your family enjoys doing together. This could be anything that you enjoy doing or that you think you're good at!

Some guidelines to help you get started:
- Try to take pictures that represent your hobbies and your family's hobbies.
- Try to avoid getting non-family members in your pictures.
- Try to take 5 pictures for **each** member of your family AND 5 pictures of hobbies that your family does **together**.

We will share these pictures with each other in the workshop next time, so please take a minute to review the pictures as a family before bringing them in.
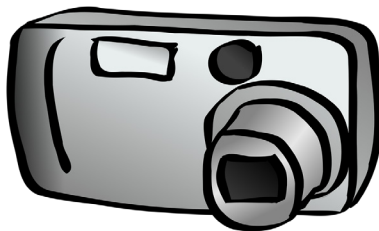
OPTION 2:
CODE REMIX

Follow the steps on the Hummingbird website to practice programming standard and tri-color LEDs in Scratch

Some ideas to help you get started:
- Find the Help folder on your computer's desktop and open the file called *Creating Light with LEDs (Scratch),* or go online to http://www.hummingbirdkit.com/teaching/creating-light-leds-scratch Follow the steps to try the Tri-color and Single color LEDs
- TRY: Once you can turn lights off and on, try making a new pattern of flashing lights or colors.
- Using the camera in your backpack, take photos or video of the work you do together!

Save your program or programs on your computer.

For more help, check out the Tech Tales website: https://techtalesweb.wordpress.com/tutorials/

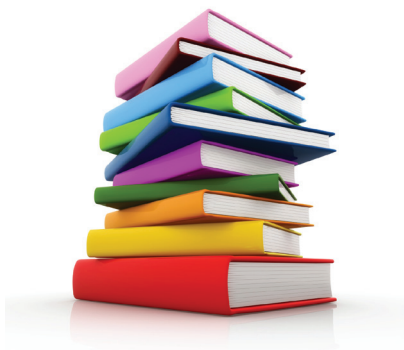Tri-Color LED   Single Color LEDs
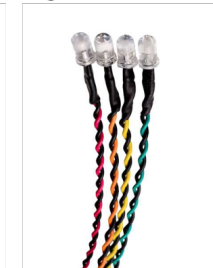
home play day 2

OPTION 1:
EXPLORE ART, SCIENCE &
ENGINEERING MATERIALS

Take home one of the suggested books, videos, or web sites related to art, science, or engineering

Choose something you learned from your exploration to share with the group next week

OPTION 2:
HUMMINGBIRD REMIX

Use the code you were introduced to in the workshop to try out some new things

Some ideas to help you get started:
- Try a new component. Try hooking up a motor or LED that you haven't used before.
- Remix the Scratch code you started in the workshop. Try to change the speed of the motor or blinking of lights. Can you make two things run in the same program?
- Using the camera in your backpack, take photos or video of the work you do together!
- Save your program on your laptop in a folder on your desktop.

For more help, check out the Tech Tales website:
https://techtalesweb.wordpress.com/tutorials/
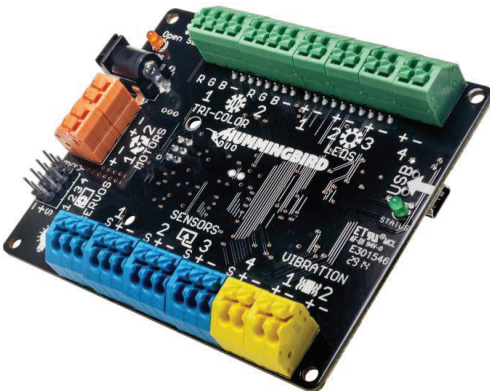
home play day 3

OPTION 1:
SELF-DOCUMENTATION

**What programmed objects do you use in your everyday life?**
Take some pictures of things in your life that are programmed.

What do you use in your life that uses a code, or a computer program, to run? These could be things you use in your home, at work, or while you're out in your community.

Some guidelines to help you get started:
- Try to take pictures of the objects themselves and not other people
- Try to take between 5-10 pictures
- We will share these pictures with each other in the workshop

We will share these pictures with each other in the workshop next time, so please take a minute to review the pictures as a family before bringing them in.
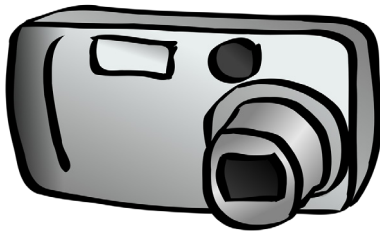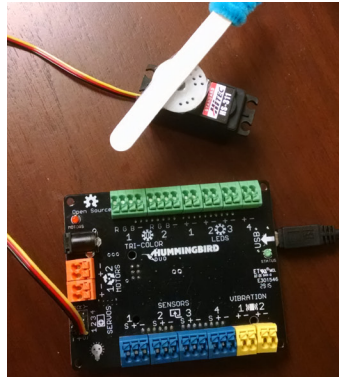
OPTION 2:
CODE REMIX

Program 1 component to do 3 different things

Some ideas to help you get started:
- Choose one component in your project and program it to do three different behaviors
  For example: program an LED to turn on to a sensor, to flash on and off forever, or light up for two seconds. This can be three different Scratch programs, or only one.
- Using the camera in your backpack, take photos or video of the work you do together!
- Save your program or programs on your computer.

For more help, check out the Tech Tales website: https://techtalesweb.wordpress.com/tutorials/

home play day 4

OPTION 1:
COMPONENTS REMIX

Test drive a new component you haven't used yet, or revise one you are already using in your project.
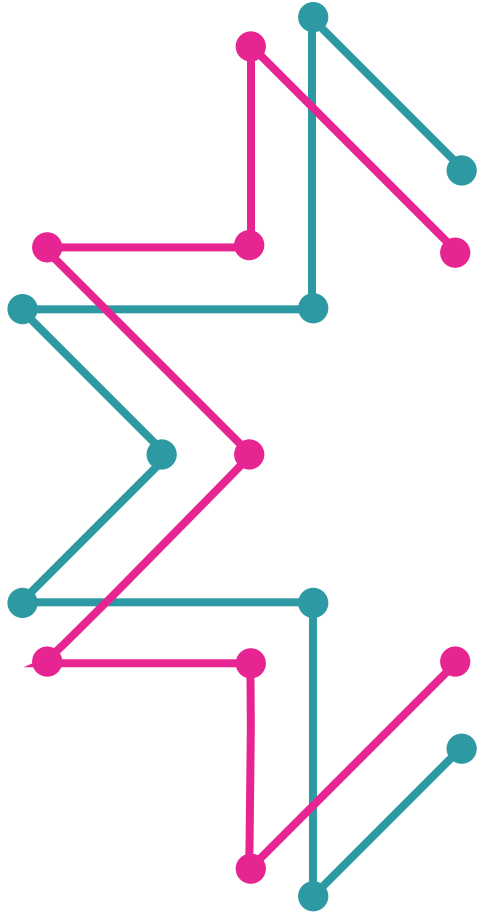
Some ideas to help you get started:
- Try a new input or output component.
  For example: If you have only tried the distance sensor, try out the rotary knob.
- If one of your components isn't working the way you want it to, revise the way you are using it. Is there a mechanical solution? Is there a programming solution?
- Using the camera in your backpack, take photos or video of the work you do together!
- Save your Scratch program on your computer.

For more help, check out the Tech Tales website: https://techtalesweb.wordpress.com/components/
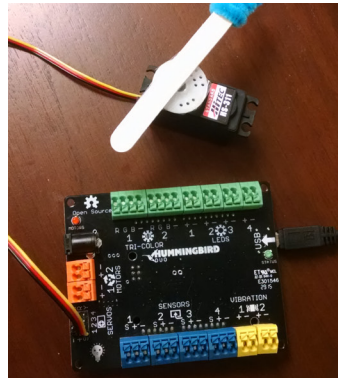
OPTION 2:
ACTIVITY REMIX

If you have not tried all the home play

activities, go back and try them out,

or do one in a different way.