It Might Be an Apple

Description

“One day, I arrived home from school. On the table sat an apple. But it might not be an apple at all.”

*It Might Be An Apple* is a meandering book by Japanese illustrator and author Shinsuke Yoshitake, in which a young boy finds an apple on the kitchen counter. He goes on to speculate what the apple might be, starting with small variations and growing to wild speculation:

This workshop will follow the arc of the book. We’ll explore the driving question “What if something isn’t what it seems to be?” and allow participants (1) to notice characteristics of familiar foods, (2) imagine possibilities of what else the food might be and then (3) create an interactive food sculpture of what they imagine. [Examples of food + tech possible projects using Scratch & WeDo, and different prompts: Sammy the Sandwich & Ramblin’ Apple.]

Example Projects
It Might be a Taco, or It Might be a Sleeping Bag for my Gerbil (this project uses Micro:bit & a servo)

![Image of a taco-shaped sleeping bag for a gerbil]

Sleep tight! It's hard to see here, but the gerbil ear is peeking out on the right side. Video Here

It Might be Corn, or It Might be a Desktop Cheerleader (this project uses only the Micro:bit)

![Image of a corn-shaped desktop cheerleader]

Cheering you along as you work on other projects. Video Here

The learning goals for this activity include
- **Tinkering & Material Fluency:** Students will be given the opportunity to tinker and explore the properties of various common crafting materials and simple technology tools. This will encourage them to use familiar materials in unfamiliar ways.

- **Troubleshooting:** Due to the open ended nature of the project, during the design and construction of their final projects, students will run into issues both social and technical.

- **Basic Computer Programming:** Students will be introduced to block based programming (MakeCode) to program the Microbit & servo motor embedded in their project.

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**Schedule**

**Day 1**

**Part 1: Welcome & Introduction**  
(10 minutes) Welcome & Workshop Norms  
(15 minutes) *It Might Be an Apple* Reading  
-For older groups take excerpts for deep dive discussions  
(30 minutes) Hands on Activity  
-Build a trap, for older groups tie it to an imagined animal and make the animal

**Part 2: Introduction to Micro:bit**  
(15 minutes) Tech Intro  
(20 minutes) 10 Block Challenge  
-Higher level/older: add behavioral adaptation to imagined animal

**Break 5 min**

**Part 3: Studio Time**  
(45 minutes) Start Making!  
-Individual instead of group remotely

(10 minutes) Reflection  
-document on slides to upload

**Day 2**

**Part 1: Studio Time**  
(10 minutes) Warm-up  
(60 minutes) Keep Making!  
(10 minutes) Clean up

**Break 5 min**

**Part 2: Reflection**  
(20 minutes) Finish Process Journal & Rehearse  
-upload project online

**Part 3: Showcase**  
(30 minutes) Showcase  
(5 minutes) Clean-up

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**Lesson Guide**

Day 1

Materials: *all per person*
- Copy of *It Might Be an Apple*
- Computers
- Micro:bit & USB cable
- Servo with cables, 4xAA Battery Packs (optional if using servos-challenge)
- 10 pieces of paper, cardboard from box
- Markers, Scissors
- 5 paper cups, 3 paper plates
- Gluestick, tape, 10 rubber band
- 20 Q-tips, 10 cotton balls, 6 ft string, 25 popsicle sticks, 14 googly eyes, 20 pipe cleaners
- Miscellaneous craft materials and recyclables (Craft Foam sheets, Aluminum Foil, Aluminum Tape, Felt sheets, Sequins, Washed Recyclables.)
  - students may use what they have around the house and approved by adult

Part 0: Getting Set Up

*Make sure students have everything they need for activities:*
- **Make sure everyone has materials.** Check everyone’s materials have been sent and arrived.
  - if books did not arrive video here: [https://www.youtube.com/watch?v=Ch_c4WsAYZA&ab_channel=StMary%27sPrimaryAcademy-Folkestone](https://www.youtube.com/watch?v=Ch_c4WsAYZA&ab_channel=StMary%27sPrimaryAcademy-Folkestone)
- **Test Tech Tools.** Test each of the laptops, Micro:bits, and servos before sending materials.

Part 1: Welcome & Introduction

(10 minutes) Welcome & Workshop Norms

*This is your opportunity to set the tone and culture of your mini-5-hour-long learning community, and get all of the participants sharing and talking to the whole group. This includes setting some norms. There are suggested norms included here, which you might modify to be in line with existing classroom or program rules and norms.*

- **Check-in Question:** Encourage everyone’s video to be on. Participants share their name and a favorite food or animal.
- **Review the Agenda:** Review the flow of the first day in more detail, and a sketch of what will happen tomorrow.
- **Establish Workshop Norms:** Generate the full set of norms collaboratively. Norms you can consider:
  - **Respect:** This includes respecting each other, the materials, and *yourself*.
  - **Try New Things:** This workshop is an opportunity to tinker with materials, and ideas. Use it as an opportunity to take (safe) risks. This might include using materials in new ways, pushing yourself to share in front of the whole group, or making a new collaborator. *It also connects to the learning goals of the workshop: Tinkering & Material Fluency & Troubleshooting.*
  - **One Mic:** In this workshop, you’ll have the opportunity to share your ideas with the whole group. In these settings it is important to listen to the ideas your peers and the
facilitator are sharing when they are talking. This way, we’ll all be learning together. Use the chat and white board function when appropriate (multiple input).

(15 minutes) It Might Be an Apple Reading
This is the jumping off for your projects. Depending on the age of the participants this may be structured in different ways to be most engaging:

- **Storytime**: Have students popcorn each other to read a page. Inject with “I notice…” “I wonder…” as sentence stems to encourage observations about the pages.
- **Shared Reading**: For older students, show pages of the book and ask speculations on similar examples in life they have seen. Bring in examples of adaptations, and if time perception and designs.
  - have resources students can read or see concepts, and for older students how to do independent research

(30 minutes) Prototyping
This will give the participants an opportunity to think divergently about their favorite food or animal, identified during the check-in question. Feel free to use the prompts provided here or make up your own. This activity is inspired by the drawing activities of cartoonist and teacher Lynda Barry.

- **Ask students to set aside ¼ of the materials for this activity, save the rest for own project**
- **A. Brainstorm ideas**: Create a list of many ideas for your trap - what and how it traps. Compile your ideas into a google slide to be used for future project documentation.
- **B. Plan/Design your trap**: Create a drawing of your trap on paper. Indicate dimensions and materials. Make the dimensions of the trap no larger than 12 in x 12 in to use left over materials in future projects.
- **C. Build the trap**: Assemble the prototype and feel free to include approved baits or use other materials at home (but document all additions).
- **D. Communicate the trap design to the class**: Presents your trap design to the class and explains how it works. Point out the features you incorporated to lure and trap.
- **Challenge**: older students may tie the trap to a constructed imagined organism, and may also add onto it for other challenges

- example of trap: [https://www.youtube.com/watch?v=G6az6ZoPd5o&ab_channel=TeachEngineering](https://www.youtube.com/watch?v=G6az6ZoPd5o&ab_channel=TeachEngineering)

Part 2: Introduction to Micro:bit
In this section, participants will be introduced to the Micro:bit, the technology tool that they will use to create their food sculptures. Some participants will already be familiar with block based programming languages (such as Scratch), robotics kits, or other CS tools from school or other programs. This introduction will be an opportunity to share an overview of the interface, load their first program onto the Micro:bit, and start to explore the coding environment.

(15 minutes) Tech Intro
● **Getting Set-up:** Each person will need a computer/laptop and one of the Micro:bit Kits. You’ll want them to do the following steps, while you model for the class:

1. Connect the Micro:bit, servo, and battery pack together as seen in the image. (The servo has 3 wires: power, ground, and one to carry the commands from the Micro:bit. The power and ground should be connected to the appropriate pole of the battery pack. The servo is also connected to the Micro:bit with the third wire to the P0 on the Micro:bit, and the ground connected to the Micro:bit’s ground. Skip if not using servos.)

2. Connect the Micro:bit to the computer/laptop via USB.

3. In Google Chrome, navigate to https://makecode.microbit.org/

4. Click “import” on the right of the page, import URL, and then paste this:
   - If using servos: https://makecode.microbit.org/_i5xWcmaftFi8
   - If not using servos: https://makecode.microbit.org/_7ecezd40cFUY
   - You may also download the correct file onto each individual computer and have participants load from a file.

5. Click the sprocket in the top right, and select “Pair device” to connect the Micro:bit to the computer. (Without this direct connection, participants will have to download their .hex file when programming and drop onto the Micro:bit icon appearing on the desktop. A direct connection, which works best in Google Chrome makes the iteration and debugging process easier.)

● **Explore the Micro:bit & Interface:** Next, walk the participants through the Micro:bit itself and three parts of the interface, from left to right, plus the Download button:

   ○ The Micro:bit is a small computer that you will use to make your creation. For being so small, it has a lot on board. (For more detailed information, visit this site https://makecode.microbit.org/device)

   - Two programmable buttons (A & B)
   - 25 individually programmable LEDs (little red lights)
   - 3 digital/analog input/output pins, plus a power and ground/back port (the Servo is already hooked up to this)
   - Flip it over, you’ll see arrows to see:
     - The processor
     - Compass
     - Accelerometer


- USB connector
- Battery connector
- And a Reset button

- On Screen Simulator: This shows you what your program will look like when running on the Micro:bit. It has simulations of all of the parts of the Micro:bit, including shaking it or pushing the buttons.
- The Code Blocks: In the middle, you’ll find all of the blocks you’ll use to program the Micro:bit. Each color has a different type of block.
- Your Program: You can see there is already a program started. This is where you will build your project.
- The Download button: If the “Pair device” was done correctly, clicking this will push your program onto the Micro:bit. Try it now, and see what happens!

- **Explore the Sample Program:** Now you’ll want to walk the participants through an exploration of the sample project, which has a sample of many of the blocks you’ll need to get started. You can read through each stack of blocks like a sentence, for instance “On start, show the icon smiley face, then pause for 1000.” Work your way stack by stack, exploring. Some things to note for each stack, that you’ll want to make sure comes up in your conversation:
  - On Start: Each program will have this “on start” and it is what the Micro:bit will do as soon as it gets power, or you hit the reset button on the back.
  - Forever: This stack of blocks is inside a “Forever” block, that looks like a mouth. After running “on start” the program will loop through these blocks in order until you stop. This is why the heart is beating on the LEDs.
  - On button A pressed: This block is pink. If you look in the middle, you see pink are inputs. So when the Micro:bit receives the input of the A button being pressed, it will do what is inside the mouth. In this case, if you are using servos it will make the servo move, if not it will display a string of text.
  - Servo Blocks: This block says “Servo write pin 0 to 0” or “Servo write pin 0 to 160”. You plugged the servo into pin 0 when you were setting it up, so this tells the Micro:bit to send a signal to that pin. The second number (0 and 160) tells the servo what direction (in degrees) to turn the motor to. This servo has a range from 0 to 180. Try changing this value to control the direction of the motor.

-video for students to look back at:
https://www.youtube.com/watch?v=kaNtg1HGxY&list=PLBcrWxTa5CS0mWJrtyvii8aG5KUqMXySk&ab_channel=SparkFunElectronics

(20 minutes) 10 Block Challenge

*The participants will now have the opportunity to explore the interface and Micro:bit a little bit through a design challenge.*

- **The Challenge:** Give students 15 minutes to make a program that does something when they shake, tilt, or move the Micro:bit. Encourage them to mostly remix the blocks that are already out in the project, but they can also explore the blue “Basic,” pink “Input” buttons.
● **Circulate:** As the participants are working, ask questions like “Can you walk me through what you are working on?” or “What is something you’ve discovered?” to gauge their thinking and understanding.

● **Share:** After the time is up, go around having each person quickly share:
  1. What they made.
  2. One thing they figured out about the tool / program.
  3. One thing they still wonder about the tool / program.

● **Challenge:** if a student already knows how to code, and feels confident exploring without instructor help can code for microbit here [https://python.microbit.org/v/2](https://python.microbit.org/v/2) -online help: [https://www.youtube.com/watch?v=XMr6Fg74fZY&ab_channel=ShawnHymel](https://www.youtube.com/watch?v=XMr6Fg74fZY&ab_channel=ShawnHymel)

5 Min break

Part 3: Studio Time

*This will be the first of two studio times for participants to create their interactive food or animal sculpture. Before you send them off to create, you’ll want to remind them of the Norms from the beginning of the session and introduce them to keeping track in the presentation. The presentation will help you and participants capture evidence of their making and help them reflect on their experience at the end of the workshop.*

(45 minutes) Start Making!

● **Introduce the Process Tracking:** This can be added to google slides used before. Remind participants of the Norms you established at the beginning of the session. One of these norms was to *Try New Things*. Explain that when you try new things you might get stuck, or frustrated. One of the uses of the Process Tracking is to give you examples of how to *troubleshoot* if you get stuck while working. The slides are as follows:
  ○ **First slide:** Participants should personalize or decorate the cover however they’d like.
  ○ **Stuck Suggestions (slide 1-2):** Add shared strategies that participants can try if they get stuck, as well as a spot to write down their own strategies. Tell participants that if they get stuck, they can use these strategies to help troubleshoot, and as they try different strategies to make a “check” in one of the boxes so they can remember all the ways they have worked through “stuck” moments as they work.
  ○ **Daily Documentations (slide 3-4, 5-6):** These pages will be filled out mid-way and after Studio Time on each of the days. The prompts are:
    ■ Day 1, Mid: Make a list/draw all of the materials you have used or tried so far.
    ■ End: Describe your project in 3 words. What was 1 discovery you made today?
    ■ Day 2, Mid: What is one change of direction you’ve taken since the beginning?
    ■ End: Describe your project in 3 words. What was 1 discovery you made today?
  ○ **Last slide:** Final takeaway.

● **Introduce the project:** If you haven’t already, this is a chance to show some example projects to the participants. Several sample projects are included here, but before running this workshop you should also make your own! This will let you show a real project to the participants, and let you experience the workshop as a learner. You’ll want to show a range of examples to show the
learners some range of possibilities. (Bonus Resource: This blog post from the Tinkering Studio has some good thoughts on curating the “perfect example” https://www.exploratorium.edu/tinkering/blogs/tinkering-art-perfect-example)

- **Studio Time!** Students should begin working on their projects.
  - Depending on the group, have breakout rooms for help and collaboration. They could share their progress with each other, brainstorm a list of things they might want to make, or tinker with materials to get started.
  - Half-way through (~20 minutes), have students pause and fill out the first Daily Documentation.
  - As participants are working, circulate breakout rooms. Ask them to describe their project, give tips and feedback, and a supportive ear.
  - Use the Micro:Bit Cards as suggestions to help participants figure out different ways to code their Micro:Bit interactions.

(10 minutes) Wrap-up and Reflection

*Saving time for reflection can be a challenge, and it can be tempting to let participants work right up until the end, but this is a chance for participants to make meaning of what they worked on today and build a learning community.*

- **Clean-Up:** Participants should tidy up the space, and sort unused materials. Set a place to leave their projects overnight until the next day’s workshop.
- **Daily Documentation:** Fill out the next slide in the presentation, which asks to describe their project in 3 words, and write a discovery they made today.
- **Share Out:** Either pop around the room and ask students to share the discovery they wrote down, or go around and have each participant share their daily discovery.

**Day 2**

**Materials:**
- Participant work from Day 1.
- Computers
- Micro:bit & USB cable
- Servo with cables, 4xAA Battery Packs (optional if using servos)
- Craft materials from day 1

**Part 1: Studio Time**

*After a quick warm-up, participants get back to work on their projects. Participants will need to finish their project by the end of this studio session, but remind them that a “Work in Progress” is totally fine. They will have the opportunity to share their work with the whole group during the showcase.*

(10 minutes) Warm-up
This is a chance to get moving, and ready for studio time. This is particularly helpful if you are starting first thing in the morning, before participants are totally awake, or right after meal time. You can fill in your own favorite active warm-up or mind warmer here. Some suggestions:

- Zip, Zap, Zop: Simple game to get participants moving and making silly noises. Full description here: [https://dbp.theatredance.utexas.edu/node/29](https://dbp.theatredance.utexas.edu/node/29)
- Food Creation Noises: Ask participants to think about their project, and the thing it is based on. If something interacted with the thing, what action would it make? Go around the circle and have the participants share.

(60 minutes) Keep Making!

**Students should keep working on their projects.**

- Depending on the group, have breakout rooms for help and collaboration. They could share their progress with each other, brainstorm a list of things they might want to make, or tinker with materials to get started.
- Half-way through (~20 minutes), have the groups pause and fill out the first Daily Documentation.
- As participants are working, circulate breakout rooms. Ask them to describe their project, give tips and feedback, and a supportive ear.
- Use the Micro:Bit Cards as suggestions to help participants figure out different ways to code their Micro:Bit interactions.

(10 minutes) Clean-up!

*Recycle, re-sort materials, put tools away. The only thing on participants’ spaces should be their project and laptop. Cleaning up now will keep from having a mad rush at the end of the workshop.*

5 Min break

Part 2: Reflection (20 minutes)

- **Daily Documentation:** Fill out the google slide, which asks to describe their project in 3 words, and write a discovery they made today.
- **Final Reflection:** On the last slide, participants should write one Troubleshooting Takeaway that they used in this project that they want to remember for the next time they work on a project.
- **Practice Showcase Presentation:** Each student should make a plan for sharing their project with the whole group. Students may use their progress tracker (copy) adjusting the details for the requirements for the showcase. The presentations will include the following:
  - Share what inspired your project.
  - Explain what you made.
  - Demonstrate your project.
  - Each person in the pair shares their Troubleshooting Takeaway
  - Audience asks 1-2 questions.
  - Everyone applauds.

Part 3: Showcase!

(30 minutes) Project Share-out
Ask for volunteers, or go clockwise on zoom. Each student shares their project using the presentation template above.

(5 minutes) Clean-up
Can disassemble their projects, decide what they want to keep.