GirlsSolveIT
Quest 1

Welcome to the 2024 GirlsSolveIT competition!

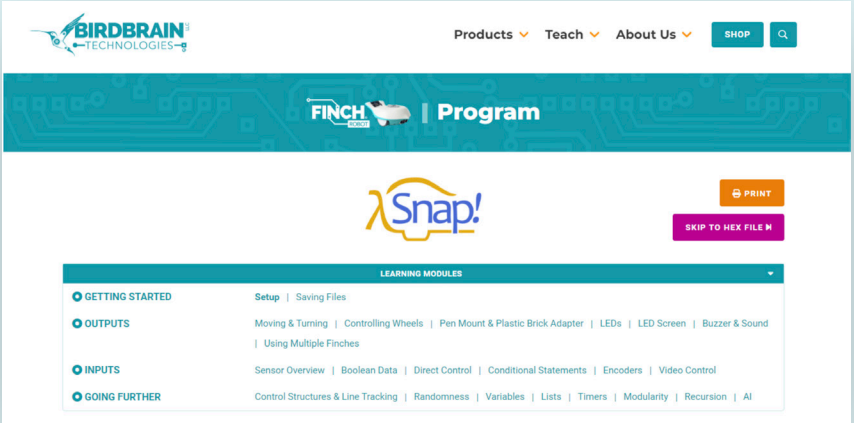
Materials Required:

- Cups
- Car cut out
- Gas station cut out
- Measuring tape
- Glue dots

NOTE: Actions that are underlined are graded. All Challenges are mandatory for full credit. Bonus Challenges will earn your team extra points! Bonus challenges determine the winner in case of a tie!

BOT SETUP

- To set up your Finchbot, follow the instructions at https://learn.birdbraintechnologies.com/finch/program/.
- Select your Device (Windows PC/Mac/Chromebook).
- For programming language, select Snap. This is the programming language we will be using this year!
- Click **Next**.
- Click the Program tile.
- Your page should now look like this:



- Click **Setup** in the Getting Started section and scroll down to follow all 18 instructions.
  - In step 3, even if your Finchbot is flashing 3 letters, Download the HEX file and add it to your Finchbot.
  - In step 8, if you are using Windows PC or Mac, we recommend you downloading BlueBird Connector to connect your Finchbot.
- Once you complete the Getting Started section, scroll up and click Saving Files to learn how to save your code. Be sure to save frequently so you don't lose your hard work! We recommend you create a Cloud account for your team. This will allow you to easily save and share your code amongst your team.
- Note: Programs written in Snap! using the BlueBird Connector for Mac/Windows cannot be run on snap.birdbraintechnologies.com, and vice versa. Use the converter at https://www.birdbraintechnologies.com/BitFinch2Converter/ if you need to move a program from one platform to the other.

Quest 1 Competition

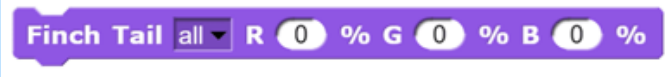
Concepts Covered:

- Moving & Turning: https://learn.birdbraintechnologies.com/finch/snap/program/3-1
- **Finch Move Block**
  The **Finch Move block** is used to control your Finch's forward or backward movement.
  - Use the drop down arrow to select "Forward" or "Backward."
  - Set the distance your Finch will travel by typing a number into the ___ cm space. (Finch distance is measured in centimeters.)
  - Set the speed your Finch will move (0%-100%) in the __% space.
  - The marks on the side of the wheels allow you to see wheel rotation for yourself.

- **Finch Turn Block**
  The **Finch Turn block** is used to control the angle and speed of your Finch's turn.
  - Use the drop down arrow to select "Right" or "Left."
  - Set the angle your Finch will turn (0-180) by typing a number into the __ degrees space.
  - Set the speed your Finch will move (0%-100%) in the __% space.
- **LED Lights:** https://learn.birdbraintechnologies.com/finch/snap/program/6-1

- **Finch Beak LED Block**
  The **Finch Beak block** is used to control the full color LED in the Finch's beak.
  - A full color LED is 1 bulb with 3 color components: red, green, and blue. When combined, these 3 colors can make any color.
  - Set the brightness (0%-100%) for each color (red, green, and blue).
  - To turn off the LED, set all values to 0%.

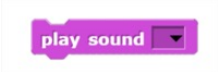
  - Similarly, the **Finch Tail LED block** is used to control the LEDs on the tail.



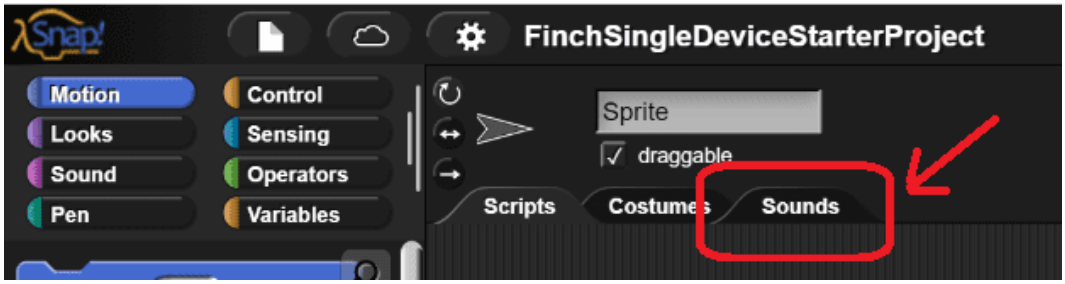
- **Sounds:** https://learn.birdbraintechnologies.com/finch/snap/program/8-1

  Play Sound Block

  - Finch has a built-in multi-tonal buzzer, which you can use to create many simple songs or sound effects. Snap! also lets you play sound directly from the computer's speakers. You can use a variety of pre-recorded sound effects or make a custom recording.



  - The play sound block in the Sound menu will play sounds through the computer itself, rather than through the Finch. The play sound block allows you to use the drop down menu to select from a variety of sounds that you can record or add to the project.
  - To import a sound or record one, select the Sounds menu:

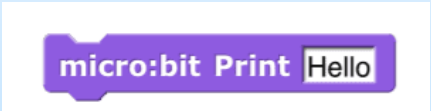


  - To import a sound, simply drag a sound file from your computer into the Sounds area.
  - To record a sound, click the red circle in the Sounds area. Click Save to save the new recoding. If you have trouble recording a sound in Snap!, you can use an online recorder such as this one, and then download the file and drag it into the Sounds area.
  - Once you have imported or recorded a sound, it will show up in the Sounds area. To use it in your program, click on Scripts and then use the play sound block. The dropdown menu will now allow you to select the sounds you imported or recorded.

- **LED Screen:** Finch2 - Snap - Program (birdbraintechnologies.com)

  Finch Print Block

  - The micro:bit Print block prints letters on the LED screen.
  - Click in the white space with the word "Hello" to type a message.
  - The LED screen will match letter case (upper and lower) and can print numbers.



Quest 1

Previously, the GirlsSolveIT challenge followed Finch on a heroic island adventure. Finch deserves a break because she has solved many quests and thinks a road trip is best. She wanted to go somewhere fun and after her research, she decided Florida would be the best because there are amusement parks there.

“This is going to be so fun! I can’t wait. I’ve never been to Florida. This trip is just what I need to rejuvenate myself!”, Finch thought to herself.

Finch couldn’t contain her excitement. To keep her mind preoccupied, she decided to prepare for the road trip by getting the car ready, getting supplies and packing her bags, and planning a route from Michigan to Florida.

“Snacks- check, water – check, binoculars – check, flashlight – check, first-aid kit– check, money – check, my favorite cap – check, fuel – hmm? I completely forgot to check my fuel!”

Challenge 1

- To get the car ready, make sure the Finch robot is set up successfully and ready to go! While getting the car prepped, Finch notices the gas light turned yellow/orange which means the gas tank is running low.
- Green means that fuel level is >80%, yellow/orange means that the fuel level is between 20%-80%, and red means that the fuel level is below 20%!
- Use what you've learned to show the Gas levels through lights or sound recordings.
    1. **Turn Finch Beak Light yellow/orange to mean gas tank is only half full.**
    2. **Use the options you learned about outputting sound to show Finch's reaction to seeing that the fuel level is low.**

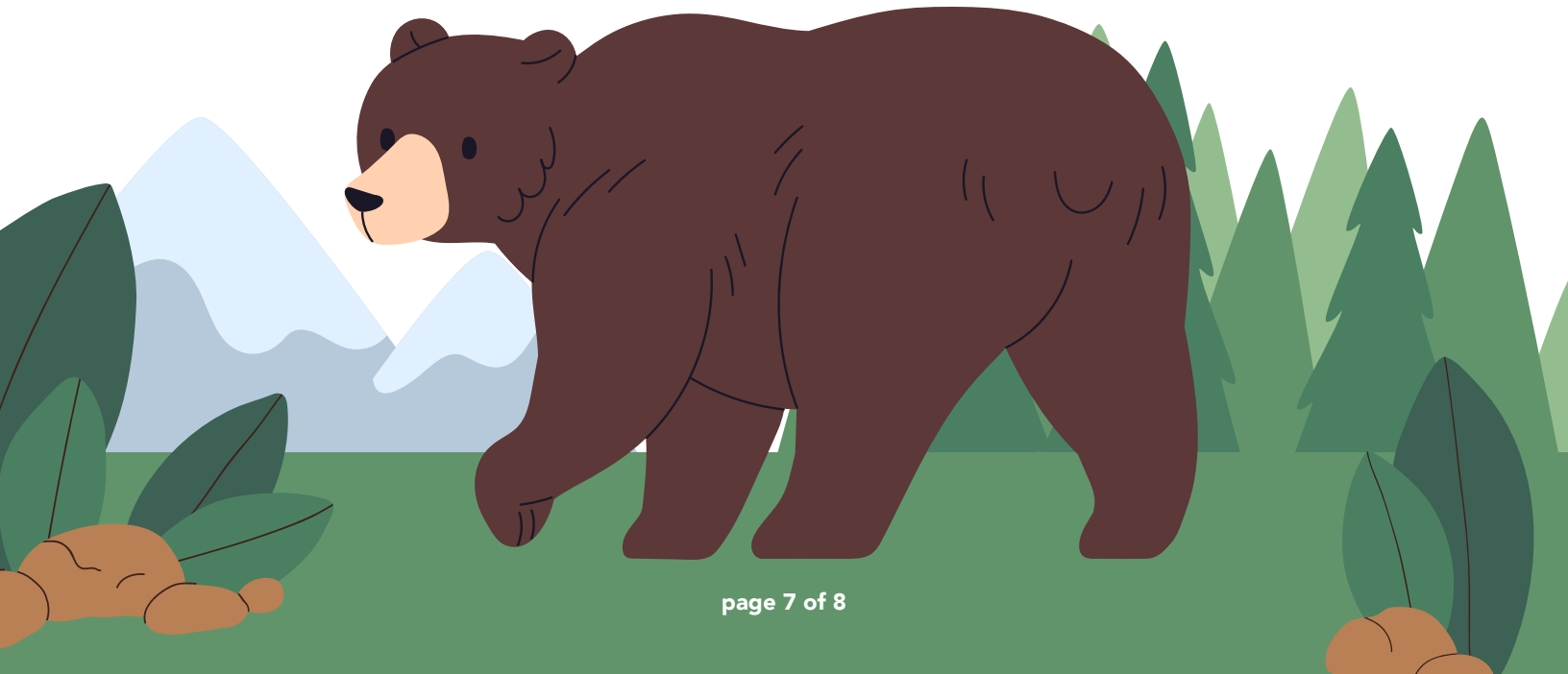
Challenge 2

- Before Finch can pack her bags for her Florida road trip, she first needs to get gas and pick up supplies. There's a store that has both gas and supplies, so Finch decides to go there.
    1. **Set Finch down on the ground and place a cup 36 inches away. The cup should have the gas station/store cut out attached.**
    2. **Program Finch to move forward to the cup. (1 inch = 2.54 cm)**
    3. **Once at the cup, pause for 5 seconds.**
    4. **Set Finch Beak Lights to green to mean gas tank is full.**
    5. **Display/play a message that lets us know the gas tank is full. You can either print the message to the microbit or play a recording you made! (Both equal same number of points)**
    6. **Program Finch to turn 180 degrees and move back to starting point.**
    7. **Display/play a message that you're ready to start the road trip. You can either print the message to the microbit or play a recording you made! (Both equal same number of points)**
- Once Finch is back from the store, Finch is ready for the road trip to Florida!

Bonus Challenge – Optional

You are able to program each of the four tail lights of your Finch using the Finch Tail block! For bonus learning, we want you to redo Challenge 2 but program the Finch Tail Lights instead of the Beak to indicate the level of the gas tank.

- All 4 Green Tail Lights = Full Gas Tank
- 2 Yellow/Orange Tail Lights = Half Full Gas Tank



To submit the Quest:

- Record the entire Quest in one continuous and complete video.
- Upload the video to YouTube – be sure the account is public.
- Upload pictures or videos to Instagram for extra points – be sure the account is public.
- Screenshot all the Snap code used to complete the quest – be sure the screenshots are clear.
- Submit the quest with a link to your public YouTube video, and upload screenshots of the code.
- If reviewers are unable to read your screenshots or access your team's YouTube Video because the url is not set to public, your team will receive zero points for those items.
- Remember, actions that are underlined are graded. All Challenges are mandatory for full credit. Bonus Challenges will earn your team extra points! Bonus challenges determine the winner in case of a tie!