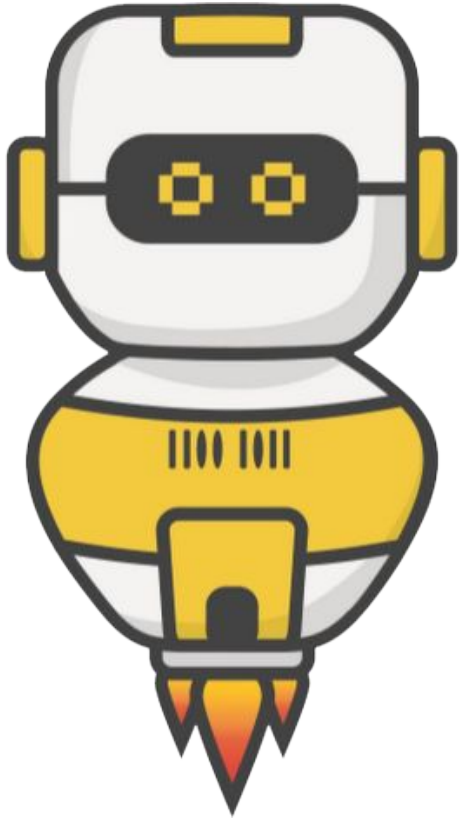
Mission 11 Remix

Create your own project from Mission 11

Warm-up

Mission 11 introduced a way to use the accelerometer. You used it for creating a spirit level.

- What are some digital devices that might have an accelerometer in it?



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Time for a project remix!

A remix can be:

- A new program created by adding new code to a program you already created
- You can combine parts of two or more programs in a remix
- Use a similar idea in a different way

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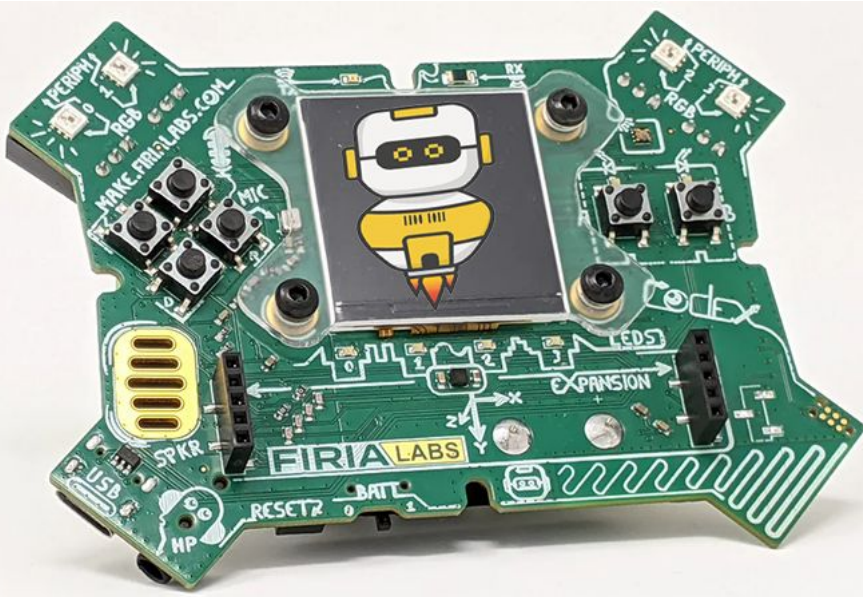
Project Remix

Creating a remix will let you:

- Improve your skills and practice the concepts from the mission
- Be creative
- Remember code from earlier programs and missions
- Work with other students
- Design an original program and write the code all on your own



Step #1

Review the mission

- Open your project from Mission 11
  - What does the program do?
  - What skills were used or concepts learned?

DO THIS:

- Fill out the information in the Mission 11 Remix Log for **Step 1**

```
from codex import *
from time import sleep
import math
# center of display (240 x 240)
CENTER = 120

# draw two lines on the screen
# leave space in the middle for the circle
display.fill(WHITE)
display.draw_line(CENTER, 0, CENTER, 105, BLACK)
display.draw_line(CENTER, 135, CENTER, 239, BLACK)

# define a variable to use for the circle's position
x = CENTER

# start an infinite loop
while True:
    # read from the accelerometer and get x value
    val = accel.read()
    tilt = val[2]
    # change accelerometer reading to degrees
    scaled = (tilt_x / 16384)
    scaled = min(max(scaled, -1), 1)
    degrees = math.asin(scaled) * 180 / math.pi
    degrees = int(degrees)
    # erase current circle, recalculate, and draw new circle
    display.draw_circle(x, CENTER, 15, WHITE)
    x = CENTER + degrees
    display.draw_circle(x, CENTER, 15, ORANGE)
    sleep(0.5)
```

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Step #2

Brainstorm ideas

- Read through remix suggestions from your teacher

Seven suggestions are on the next 4 slides. You can use any of these ideas or come up with your own.

Step #2 Remix Ideas

Mild-1A

Start with the original code. Create at least one function and call it in the program. Suggestions:

- a function that sets up the screen and lines
- a function that scales the raw data to degrees

Mild-1B

Add an introduction and wait to start the game. Add a way to exit the program using in if statement, and an ending message. The intro can be a function, but it doesn't have to be.

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Step #2 Remix Ideas

Mild-1C

Change the horizontal bubble to a vertical bubble (use y instead of x).

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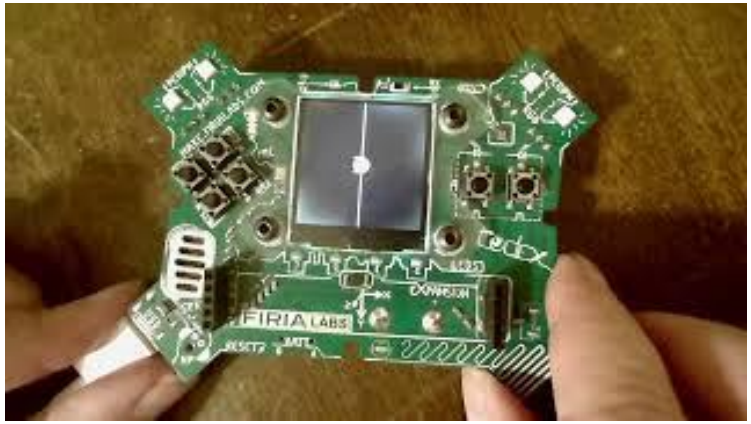
Step #2 Remix Ideas

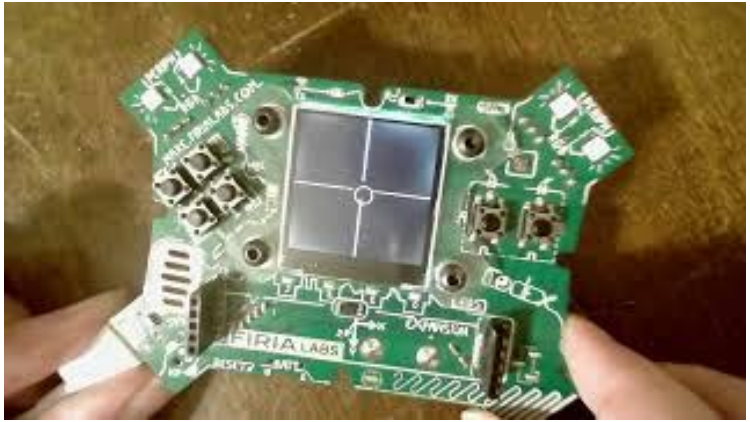
Medium-2A

Change the circle to a filled-in circle when CodeX is level. This remix can include an intro and ending.

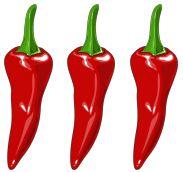


Medium-2B

Change the spirit level to check both the horizontal and vertical positions (use both x and y).

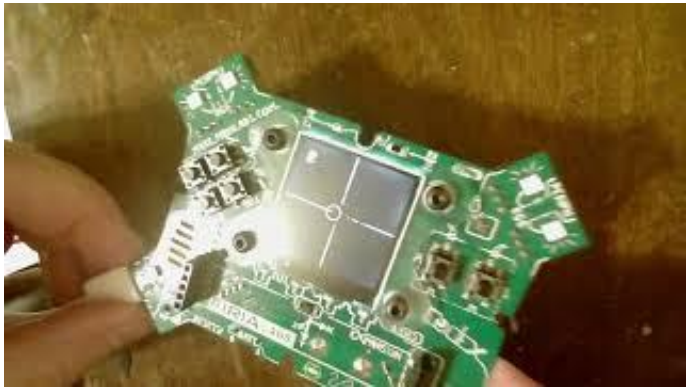


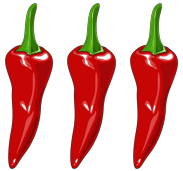
Step #2



Spicy-3A

Make the spirit level into a game. Award a point for going close to the edge but not touching the edge. Get four points to win the game. Touch an edge and the game ends.





Spicy-3B

Change the spirit level to a spirograph. Instead of erasing the circle, let it continue to draw on the screen. Choose a random color after every 20 circles.

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Step #2

Brainstorm ideas

- Read through remix suggestions from your teacher (previous slides)
- Use the suggestions as presented, or combine some of the options for your own mild, medium, or spicy project
- Use your creativity to come up with your own idea for a project
- Decide with your partner what project you will do

DO THIS:

- Fill out the information in the Mission 11 Remix Log for **Step #2**

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Step #3

Make a plan

- What variables will you need? What will you use them for?
- What functions will you create for the program?
- Do you need a list? If so, what information will it store?
- What buttons will you program, and what will each button do?

DO THIS:

- Fill out the information in the Mission 11 Remix Log for **Step #3**

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Step #4

Code your project

- **IMPORTANT:** In CodeSpace, go to the sandbox 
- Start with a new file and give it a descriptive name (**Remix11**)
- You can leave any program open, including **Spirit Level**, and use it as a guide
- Import your modules
- Create functions as you go, or when you see a need
- Write your code, testing frequently

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Step #4

Stop and test frequently!

- Don’t try to write all the code at one time
- Think about the steps:
  - Just get one thing to work, then move on
  - Step by step!
- Mistakes happen, so find them early
- Type just a few lines of code and then run the program
- If there is an error, fix it before continuing
- Use the debugger and your other programs for help

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Step #5

Documentation!

- Make sure your code is readable by adding blank lines
- Add comments to sections of your code that explain what they do

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Step #5

Get feedback

- Show your code to other students.
- What do they think? Have them fill out the feedback form on your Mission 11 Remix Log.
- The Mission Log has space for two people to give feedback. The feedback can come from two peers or one peer and yourself.

Modify your code to make your project even better

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And now you have your own remix!

Congratulations!

By completing this remix you have:

- learned more about programming
- practiced the skills and concepts from the missions
- been thinking! And problem solving and much more!

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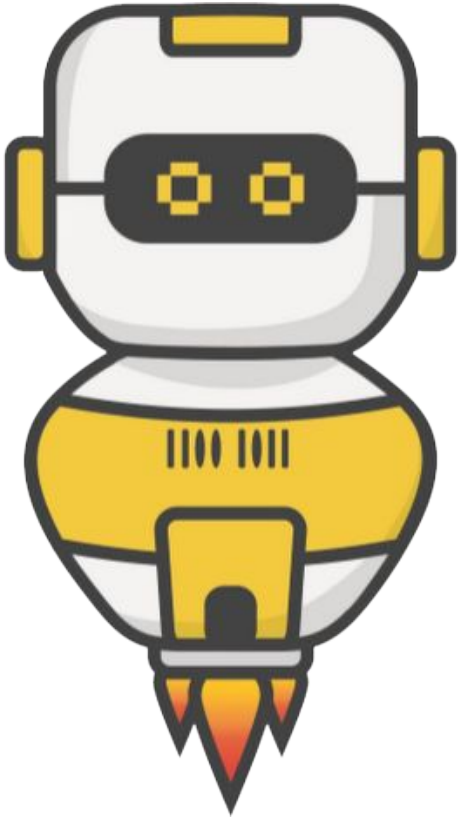
Mission Reflection

- Wow! Great job!
- Share your project with your friends!
- Run projects from other students
- Complete your Mission 11 Remix Log

- Don’t forget to clear your CodeX by running your **Clear** program



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