App Inventor Healthy Plants CIS Summer Camp (11-13yr olds)

Introduction (5 min)

- Ask students how many of them have a smartphone or use a smartphone/tablet at home.
- Explain that smartphones can do lots of different things, like give us directions, play music, even take pictures - smartphone help us change the way we interact with our daily lives
- Ask students if any of them have built an app before
    - Explain it's easier than they think!

HelloPurr Tutorial (40 min)

- Hand out devices and show them App Inventor website
- Have students complete the HelloPurr tutorial
- Unpack tutorial, talk to kids about how easy it is to build apps

Internet of Things Introduction (5 min)

- Introduce "The Internet of Things" (IoT). Explain that IoT is changing how we interact with objects in our everyday lives.
    - Ask the students if they know of any examples
        - Teacher can also provide examples (cars, homes, etc.)
- Explain that by connecting IoT to our smartphones we can have lots of information right at our fingertips.
- Tell students that's what we're going to do right now.

Healthy Plants App (85 min)

Intro to Plants and Energy with IoT (10 min)

- Talk to kids about what kinds of energy plants need to grow big and strong
    - Elicit water, light, temperature
    - Explain to kids that there are ways of measuring these types of energy using sensors, and using app inventor we can show it on our phones to better understand them.

Explore the IoT App (15 min)

- Show the Healthy Plants App and the Arduino sensors to the students (the will already app work and shows readouts as numbers). (10 min)
    - Have the students run the current version of the app to see some of the feedback they get

Modify the App (50 min)

- Explain to the students that while we are getting the readings from the sensors, it's not very pretty.

    - Have the students add the bargraphs to the app
- Explain to the students that we can also have things happen when the sensors get certain readings
    - Students will work together to figure out what sensor readings they want to create alerts for.
    - Students will code the alerts themselves (unlike with the lower cohort) changing the views both on the phone and the LCD screen

Share (15 min)

- Have students share their group's designs with their peers (one or two other groups)

Unpack and Reflect (15 min)

- Talk to the kids about how the sensors worked
    - How do they think the sensors were able collect this information
        - How does energy move from the "world", to the sensor, and maybe even the phone?
- Have kids discuss how they could use these sensors to detect energy use in other parts of their lives.
    - Have students outline what their next application might be