DaSH Home: Using Programmable Sensors to Support Student Driven Investigations During Remote Learning

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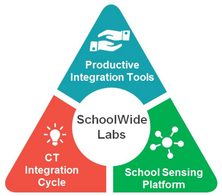
Research Context



- Researchers and teachers collaboratively designed a week-long unit where students use the DaSH to learn about and create their own displays of sensor data collected from the world around them.
- Worked together to adapt the unit for remote learning
- Lessons were attended virtually and recorded by a researcher

Remote Modifications

- Students checked out the DaSH from their teacher to use in their home.
  - Some teachers gave each student a DaSH while others gave one student per group a DaSH
- Classes were synchronous and conducted over GoogleMeets
- Students used Google Docs and JamBoards to collaboratively complete activities
- Students shared their screen or held the DaSH up to the camera when they had a problem

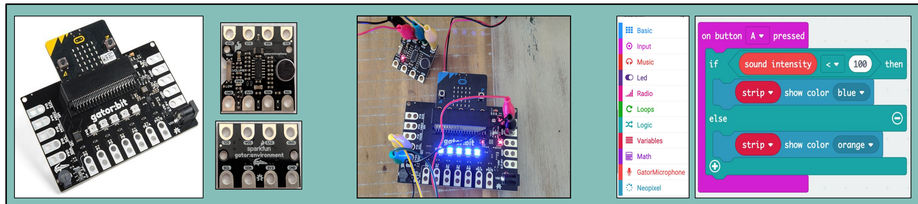
Storyline

Students are introduced to a classroom data display that shows environmental conditions in the classroom using lights and sound. Students create an initial model of how the data display works and develop a set of questions to guide the rest of the storyline.

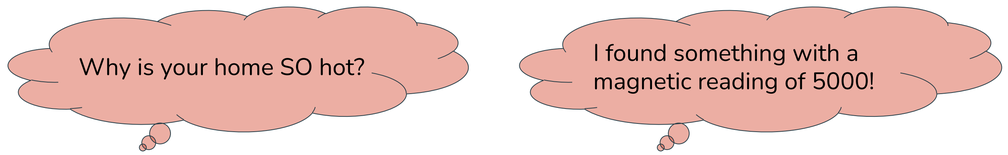
→ Students explore the different parts of the data display and examine how it collects data through programming challenges. Students update their models based on their new understanding.

Students figure out how the data display shows information using lights and sound through the creation of their own mini data displays. Students update their models based on this new information.

→ Students share their programs to demonstrate similarities and differences in their solutions. Students finalize their models and brainstorm other questions the sensors could help them answer.



Data Sensor Hub (DaSH): The gator:bit is an extension of the micro:bit which exposes more pins for alligator clippable sensors that measure temperature, soil moisture, sound, humidity, CO_2, etc. It provides functionality for simple data displays using LEDs and a speaker. Students program the micro:bit using MakeCode.



Examples of things overheard in classes by the observer (not actual quotes)

Findings

1. **Students collected data from their homes:**
   a. Led to questions and comparisons across spaces they physically occupied
   b. Engaged more deeply with the varied data than they would have encountered in the classroom
2. **Students engaged in different forms communication:**
   a. Typing results in the chat
   b. Sharing their screens
   c. Using collaborative media such as Breakout Rooms in GoogleMeets and Google Docs.
3. **Debugging looked different:**
   a. Students either shared their screen or held their sensors and display up to the camera
   b. Couldn't rely on someone else taking over the assembly and programming

Lessons for the Future

Explore how to allow students to bring home technology to explore their homes and local environment. This supports students to collect data that is particularly relevant to their spaces.

Acknowledgements

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