Lesson 4

Build Weather Stations

Townsville City Council Staff participation

Content descriptors:
Knowledge and understanding:
Examine the main component of common digital systems and how they may connect together to for networks to transmit data. (ACTDIK014)
Relevant elaborations:
• Investigating how emergent digital systems work • Explaining how data may be transmitted between digital systems in different ways • Describing digital systems as having internal and external components that perform different functions

Learning intention:

By the end of the lesson, students will be able to:

- Examine the main components of a digital system by constructing their own environmental monitoring weather station

Formative assessment suggestion:

- Individual student self-assessment task
- Observation of students building the weather stations
- Idea: photograph students with heir weather station build.

Equipment list:

- Projection screen
- Prezi lesson 3
- TCC staff to assist with the lesson
- Class set of building materials
- Class set of self-assessment worksheet.

Lesson outline: (60min lesson)

Introduction (15min)	• Prezi and videos as revision of the structure/main components of the hardware of the weather stations
	• Discuss the design features (why is it built a certain way, what benefits of colour, design, structural integrity, battery life)
	  ○ "Why do you think this weather station looks the way it does?"
	  ○ "What could be some positives/benefits of a weather station that is painted white?"
	  ○ "How do the weather stations connect to the network?"
		• The weather stations are coloured white to withstand heat.
		• Using the LoRa network, the weather stations

	○ "Why do you think it is important to have circuit boards contained inside the weather station using the Stevenson's screen design?" ○ "Why would the weather station be designed to have aeration/slates to let the air inside?" • Safety briefing of tool and equipment they need to use to build the weather stations	send data to a gateway. The gateway sends the information the network server, and the network server sends the data to the dashboard (which is where we can see the data). • To avoid having the sensor damaged by rain or extreme heat • This is to provide aeration – without airflow the temperature data collected would be inaccurate
Body (30min)	• Students working in groups to build their own weather stations (group work and collaboration space to allow students to bounce ideas off each other) • TCC step-by-step instructions given to each group • Students build their weather stations	
Conclusion (15min)	Self-assessment: • Students to complete self-assessment worksheet • Take photos of students with their successfully built weather stations	