Lesson 3 Teacher Reference

Lab/Coding Activity Resources

See *micro:bit/Makecode Troubleshooting* for micro:bit and Makecode troubleshooting guidance throughout the unit.

In addition, **Coding Cards** (in Lesson 17) may be used in the unit in one of several ways:

1. A class deck that is introduced to students in pieces, as related code ideas are figured out. The lesson numbers in the Relevant Coding Cards column are bolded to indicate which cards are newly relevant in that lesson.
2. A class deck with cards selectively revealed to students in Lesson 17 to help them figure out how to carry out coding not explicitly developed in the unit.
3. A class deck or individual decks (physical or digital) provided to students in Lesson 17 to support ideation and/or coding.

Lesson and Activity	Code Links	Student-Facing References	Teacher References	Setup and Code Explainer Videos	Relevant Coding Cards
Lesson 3 Sensor Stations	• Station 1/Temperature sensor: Makecode for the Station 1 temperature sensor • Station 2/Humidity sensor: Makecode for the Station 2 humidity sensor • Station 3/Soil moisture sensor: Makecode for the Station 3 soil moisture sensor	**Activity** • *Sensor Station Instructions* • *Stations Observations* **Coding** *Sensor Code*	**Activity** • *Station Setup* • *Stations Summary*	**Activity** • micro:bit introduction: micro:bit introduction • Station 1 setup: Station 1 setup • Station 2 setup: Station 2 setup • Station 3 setup: Station 3 setup **Coding** • Using Makecode: Using Makecode • Accessing Logged Data: Accessing Logged Data • Station 1 code explainer: Station 1/Temperature sensor code explainer • Stations 2 and 3 Code explainer: Stations 2 and 3/Humidity and soil moisture sensor code explainer	**2, 4, 5, 6, 7, 9, 10, 11**

Lesson 3 Temperature and Evaporation Lab	Combined sensor code: Make code for the combined sensor code for the Temperature and Evaporation Lab	**Investigation** • *Temperature and Evaporation Investigation Planning* • *Group Humidity and Temperature Lab* **Coding** *Combined Sensor Code*	**Investigation** *Evaporation Investigation Preparation* Sample data: Temperature and Evaporation Lab Sample Data	**Investigation** Lab setup: Temperature and Evaporation Lab setup **Coding** Combined sensor code explainer: Combined sensor code explainer	2, 4, 6, 7, 9, 10, 11, **13**
Lesson 9 Comparing Frozen Carbonated with Non-Carbonated Water	CO_2 sensor code: Makecode for the carbon dioxide sensor	**Investigation** No student materials **Coding** Code not examined until Lesson 10	**Investigation** *Carbonated Water Instructions*	**Investigation** CO_2 sensor preparation: CO2 sensor preparation **Coding** CO_2 sensor code explainer: CO2 sensor code explainer	
Lesson 10 Burning Fuel Demonstration Lab	• Temperature radio sender code: Makecode for the temperature sensor with radio sending capability • Receiver code: Makecode for receiving values via radio • CO_2 sensor code: Makecode for the carbon dioxide sensor • Example code for CO_2 sensor with radio: Example Makecode for adding radio functionality to the CO2 sensor code	**Investigation** No student materials **Coding** • *Radio Code* • *CO2 Sensor Code*	**Investigation** *Burning Fuels Instructions*	**Investigation** Investigation setup: Burning Fuel Demonstration Lab setup **Coding** • Radio code explainer: Radio code explainer • CO_2, sensor code explainer: CO2 sensor code explainer	2, **8**, 10, 11, **12**

Lesson 11 Carbon Dice Game	Makecode for the dice game (code not modified or examined by students in base lesson)	**Activity** Dice Game tracking spreadsheet **Coding** No student materials	**Activity** *Carbon Dice Game Instructions and Station Cards*	**Coding** Dice game code explainer: Dice Game code explainer	11, 13
Lesson 16 Water Pump Introduction and Mini-Challenge	• Water pump code: Makecode for the water pump with soil moisture sensor • Example challenge code: Example Makecode for adding radio functionality to the water pump code	**Investigation** No student materials **Coding** • *Code Analysis/Re-Design* • *Water Pump Code*	**Investigation** *Pump Station Instructions*	**Investigation** Water pump setup: Water pump setup **Coding** Water pump code explainer: Water pump code explainer	**3**, 7, 11
Lesson 17 Final Project		Project Presentation template			New cards that can be introduced: 1, 14