Fly *with* Python

Mission 2: Introducing CodeAIR	Time Frame: 30-40 minutes

Mission Goal: Students will learn about the CodeAIR drone and its LED lights. **Learning Targets** ● I can identify the parts of CodeAIR. ● I can connect CodeAIR to CodeSpace. ● I can create and save a file in CodeSpace. ● I can control LEDs on CodeAIR with code.	**Key Concepts** ● The battery is charging anytime CodeAIR is plugged in. ● CodeAIR must be turned on to connect to CodeSpace and run code. The switch is tiny! ● Code typed into the text editor is automatically saved to your personal file-system. ● CodeTrek is like your own personal tutor, guiding you through programming challenges. ● Python code is case sensitive. Punctuation is important! That is the first thing to check if an error occurs in code.
Assessment Opportunities ● Quiz after Objective 2 ● Quiz after Objective 8 ● Complete the program *Lights1* ● Mission 2 Assignment ● Mission 2 Review questions	**Success Criteria** ☐ Identify key parts of CodeAIR ☐ Connect CodeAIR to CodeSpace ☐ Create a program file with code ☐ *Lights1* works correctly and runs without errors ☐ Complete Mission 2 Assignment

Standards

CSTA Standards Grades 9-10	CSTA Standards Grades 11-12	AI4K12 Standards Grades 9-12
● 3A-CS-01	● 3B-CS-02	

Student Materials ● Laptop/computer with Chrome browser ● CodeAIR drone ● CodeAIR Mission 2 Assignment ● CodeAIR Flying Guide	**Teacher Resources** ● Getting Started instructions ● CodeAIR Flying Guide ● CodeAIR Mission 2 Assignment Answers ● CodeAIR Mission 2 Review Questions

Vocabulary

CodeAIR	A high performance micro-drone that's fully programmable in Python.
LEDs	Light emitting diodes; tiny and efficient electronic components that produce light. CodeAIR has 8 blue indicator LEDs, numbered 0 through 7.
Buttons	Momentary push buttons on CodeAIR that you can program. The user interface push buttons are B0 and B1.
Motors	Brushed DC motors that are electric and power the propellers to lift CodeAIR into the air and maneuver it around.
Static Electricity	A charge that builds and can cause a jolt and spark that happens when grounded.
CPU	Central Processing Unit; the brain of the computer. It interacts with all the peripherals.
Peripheral	Devices that give input or output. CodeAIR's peripherals include LED lights, speaker, motors, sensors and pushbuttons.

Code	Instructions to the computer.
Comment	Code that doesn't get run; notes in the code about what you are doing.
Module	Also known as a library; it contains pre-loaded code, like functions and methods, that can be used once the module is imported.

New Python Code

`from codeair import *`	Import the codeair library; all built-in code specific to CodeAIR
`leds.set(num, brightness)` `leds.set(0, 50)`	Sets the user LED at a brightness level. In this example, LED 0 is set to 50 percent brightness

Teacher Notes
- The assignment document follows the mission and is a place for guided notes. You can print the document for the students or assign it digitally through your LMS.
- If you or your students have trouble running code, follow the CodeAIR Flying Guide. The CodeAIR must be connected and turned on, even if you are not flying the drone.
- Review questions can be used as a class review, made into a Kahoot!, or used to create an exam in your learning management system.
- Extensions and cross-curricular projects are included to enhance the concepts in the mission. You can use the extensions to extend students' programming experience. A remix is not explicitly planned, but you can add one as an option to give students additional learning. A remix is planned after Mission 3.

Extensions
- Use the LEDs to display a pattern by either turning some lights on and keeping some off, or using different levels of brightness.
- Discuss abstraction and how it is used in the hardware of CodeAIR.

Cross-Curricular
- **SCIENCE:** CodeAIR has several LEDs. Research what an LED is and how it works.
- **LANGUAGE ARTS:** Write a technical document that explains the parts of CodeAIR and their functions.