

CODE COMBAT: LEARNING TO CODE

ERICA LOUISE RICHARDS, THE KINDEZI SCHOOL AT OLD FOURTH WARD

Unit Overview

In this personalized and integrated computer science, English Language Arts, and mathematics unit, students learn to code using Python via the programming software, Code Combat. Using a series of unique strategies, including call and response and journaling, the unit seamlessly pairs culturally responsive pedagogy with content standards to engage all students as they learn to code.

Throughout the unit, the class transforms into an internet café, where students choose the place and pace of their learning to complete coding tasks.

Standards Addressed

1. **1B-AP-08:** Students will compare and refine multiple algorithms for the same task and determine which is the most appropriate.
2. **1B-AP-09:** Students will create programs that use variables to store and modify data
3. **1B-AP-10:** Students will create programs that include sequences, events, loops, and conditionals
4. **1B-AP-11:** Students will decompose (break down) problems into smaller, manageable subproblems to facilitate the program development process.
5. **1B-AP-12:** Students will modify, remix, or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features
6. **1B-AP-15:** Students will test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.
7. **1B-AP-16:** Students will take on varying roles, with teacher guidance, when collaborating with peers during the design, implementation, and review stages of program development.
8. **2-AP-10:** Students will use flowcharts and/or pseudocode to address complex problems as algorithms.
9. **CCSS.Math.Practice.MP1:** Students will make sense of problems and persevere in solving them
10. **CCSS.Math.Practice.MP2:** Students will reason abstractly and quantitatively.
11. **CCSS.Math.Practice.MP6:** Students will attend to precision.

12. CCSS.Math.Practice.MP8: Students will look for and express regularity in repeated reasoning

**A NOTE FROM THE
TEACHER**

During this unit, your students will need access to laptops in order to use Code Combat. In addition, each student needs a journal so that they can keep track of their progress each day.

Day 1 – Beginning Code Combat

Standards Addressed: 3, 7, 11

Essential Question: How can we collaboratively navigate Code Combat?

1. Go to <https://codecombat.com/play> and select “Create free teacher account”. Write the Class Code on the board and cover it with paper.
2. You may choose any game on Code Combat for your students to complete. The recommended game is “Game Development” which is 20 levels.
3. Explain to the class that Code Combat is a game that is going to help students move from “drag and drop” programming to typed code, which is also known as scripting languages. Engage the class in a discussion about the following points:
 - What do we know about languages? Have students contribute to a list on the board (i.e., Spanish, Creole, French, Swahili)
 - Do you speak more than one language?
 - Computer programmers use languages to communicate with computer systems
 - The language students will be using is Python. Provide examples of Python in use.
4. Reveal the class code and direct students to <https://codecombat.com/play>. Once students enter the class code, they will see the class name and instructor on the screen.
5. Students will need to enter the following information to create a Student Account:
 - First name
 - Last initial
 - Username (help them choose an appropriate and unique username)
 - Password
6. After students have created their accounts, instruct them to write down their username and password information in their journals. Once setup is complete, instruct students to self-navigate through the beginner lessons. Provide guidance to below grade level students and instruct above grade level students to help their peers.

Day 2-3 – Using Code Combat

Standards Addressed: 4-11

Essential Question: How can we collaboratively navigate Code Combat?

A NOTE FROM THE TEACHER

Use fun management strategies to engage your students. For example, choose a timekeeper to help assist with keeping time. Create fun and relevant call and responses that will grab your students' attention.

Create songs and rhymes to help your students learn tricky concepts.

1. Students will begin using Code Combat by logging into the program. Select one student serve as timekeeper for the class. Instruct the students to work on level one of Code Combat for 10 minutes. After the 10 minutes, engage the class in a brief discussion about their experience with level one.
2. Create a list on the board of student examples of lines of code they used in Code Combat. After each example, ask students to correct any punctuation errors. Use a different color marker and ask students to identify unique aspects of the grammar and structure of Python codes. Be sure to highlight the importance of capitalization, spacing, and punctuation.
3. Explain to students that syntax in Python is like grammar in English. The difference is that, in English, people can present statements and commands in a variety of ways, whereas computer systems will have an error if the syntax is not accurate.
4. Introduce students to the Progress Journals. Each student should have a journal that they will use throughout the unit to reflect on their Code Combat progress. Each day, instruct students reflect on their experience with coding using the following prompts:
 - How many levels did you complete today? Describe the levels you completed.
 - How is Code Combat different from other video games you've played? How is it similar?
 - How do you deal with mistakes during Code Combat?
 - How did it feel to help your peers? How did it feel for peers to help you?
5. Allow students to work at their own pace to complete as far as level seven on Code Combat. Instruct early finishers to assist peers.

Day 4-5 – Using Rhymes to Learn Vocabulary

Standards Addressed: 4-11

Essential Question: How can we collaboratively navigate Code Combat?

1. Present a word bank to students with the following words: basic syntax, loop, function, object. Review words and definitions with students.
2. Explain to students that they will be learning a new song/rhyme to learn and remember the words and their definitions. The song is as follows:

*When you call a function
Then you call it back
I'll tell you that's a loop
And, baby, that's a fact
To control an object,
Put a period at the end
That's basic syntax
It's not complicated
When you have something extra
That you need to add
Put it in parentheses at the very end
That's the only place for argument
When coding with Python language*

Sing it once for students, then have them repeat after you to learn it. Have students provide examples of syntax, object, and function from Code Combat.

3. Students will have independent practice time on Code Combat and complete two to three new levels.
4. Complete Code Combat levels eight and nine on the board. Students needing additional assistance can watch you work through the problems on the board or continue to work independently or with a peer.
5. Have students reflect on the following prompts:
 - How many levels did you complete today? Describe the levels you completed.
 - How is Code Combat different from other video games you've played? How is it similar?
 - How do you deal with mistakes during Code Combat?
 - How did it feel to help your peers? How did it feel for peers to help you?

Day 6 -7 – Using Code Combat

Standards Addressed: 4-11

Essential Question: How can we independently use Code Combat?

A NOTE FROM THE TEACHER

Try writing goals on the board for your students. For example, write “complete 2-3 levels to earn free play on the computer” in order to get your students motivated.

1. Over the next few days, transform the classroom into an Internet Café by rearranging the seating and organization of the room. This will provide students with more autonomy – they can choose to work individually, with peers, or with the teacher one on one.
2. Students will have independent practice time on Code Combat and complete two to three new levels.
3. Have students reflect on the following prompts:
 - How many levels did you complete today? Describe the levels you completed.
 - How is Code Combat different from other video games you’ve played? How is it similar?
 - How do you deal with mistakes during Code Combat?
 - How did it feel to help your peers? How did it feel for peers to help you?

Day 8-9 – Using Code Combat

Standards Addressed: 1 - 11

Essential Question: How can we navigate variables in Code Combat?

1. Students will continue progressing on Code Combat.
2. Introduce students to the concept of a variable. Define variable as a way of storing data within the script. Use the following examples to provide more context:
 - Basic Algebra: Walk students through a simple equation to solve for “x.” Ask students to identify the variable in the equation. Practice several equations with them.
 - Display Code Combat to show how variables are assigned a value and then used as arguments throughout the script.

3. Students who have reached level 15 on Code Combat will review their journal entries in one-on-one or small groups in order to assess their understanding of variables. Work directly with students who have not reached the variables module on Code Combat. Specifically, create individualized goals and work one-on-one or in small groups with the students during the independent work.
4. Students will have independent practice time on Code Combat and complete two to three new levels.

Day 10-11 – Finishing Code Combat

Standards Addressed: 1 - 11

Essential Question: How can we complete all levels on Code Combat?

1. Students will continue to work independently and complete all levels on Code Combat.
2. Students will reflect in their journals on the following prompts:
 - How many levels did you complete today? Describe the levels you completed.
 - How is Code Combat different from other video games you've played? How is it similar?
 - How do you deal with mistakes during Code Combat?
 - How did it feel to help your peers? How did it feel for peers to help you?
3. Choose student volunteers to share their experiences and/or journal entries.