MISSION 3 Remix	Time: 90 minutes

Overview:

This remix will allow students to use their creativity to create their own project. They will use concepts from mission 2 and mission 3. They will also learn about RGB triplets, called tuples, to set a custom color. As an option, they can use random numbers for a custom color.

Cross Curricular:

- **ART:** Discuss how RGB creates all colors in light.
- **COMPUTATIONAL THINKING:** The lesson requires students to program multiple steps and coordinate pixels with images. They must think algorithmically and step-by-step to plan their project. They will follow the design process.
- Supports **language arts** through peer review and reflection writing.

Materials Included in the learning portal Teacher Resources:

Mission 3 Remix Slidedeck

The slide deck is for teacher-led instructions that let you guide students through completing a remix using the slides. There are no instructions for a remix in CodeSpace. The slides give instructions, with simplified language that is chunked into small sections at a time. The information is shown on slides with “Step #”. The tasks to complete are on slides with “Do This''.

Mission 3 Remix Workbook

The workbook can be used instead of slides for student-led or independent work. It is an alternative to the slide deck, with simplified language that is chunked into small sections at a time. Each step is on its own page. The tasks to complete are labeled “DO THIS” and have a robot icon next to it.

Mission 3 Remix Log

This remix log is the worksheet for students to complete as they work through the remix. It should be printed and given to each student at the beginning of the lesson. They write on the remix log during the assignment and turn it in at the completion of the remix.

Teacher Resources:

- CodeX mission reminders (optional)
- Code.org Pixels video (on youtube)
- **Remix Videos:**
  - Mild, Medium, Spicy#1, Spicy#2
- **Possible Remix solutions:**
  - Mild, Medium, Spicy#1, Spicy#2
- Kahoot (Missions 1-3)

Formative Assessment Ideas:

- Daily exit ticket
- Remix log completion
- Completed program
- Gallery walk
- Kahoot Review

Vocabulary:

- **Remix:** Creating something original based on other projects, or using pieces of other projects
- **Tuple:** A triplet of numbers that represents an RGB value -- example: (47, 147, 181)

Preparing for the lesson:

Students will use the Codex throughout the lesson. Decide if they will work in pairs or individually.

- Look through the slide deck and workbook. Decide what materials you want to use for presenting the lesson. The slide deck can be projected on a large screen. The workbook (if used) can be printed or remain digital through your LMS.
- Be familiar with the Remix Log (assignment) and the questions they will answer.
- Print the Remix Log for each student.
- This lesson uses a youtube video on pixels. Can you access youtube, or do you need an alternative?
- If you have a word wall, or another form of vocabulary presentation, prepare the new terms.
- The lesson goes over RGB and custom colors. Be familiar with this and use the online software in advance.
- The lesson has an option for random numbers. Decide if you want the students to do the challenge, or leave it for advanced students. Be familiar with the code.

Lesson Tips and Tricks:

💡 Teaching tip:

You can use a variety of discussion strategies to get the most engagement from your students. For example, you can have students write their answers before asking anyone for an answer. You can use one of many think-pair-share methods. You can have students write their answer and share with someone, and then have other students share answers they heard from their peers. You can randomly select students to answer.

🧑‍🤝‍🧑 Pre-Remix Discussion: Slide 2 (slides), Page 1 (workbook)

There are two questions. Students can write in their log first and then share, or discuss first and then write in their log.

- What have you learned to do with CodeX?
- What does “remix” mean to you?
  The first question is a good review, and gets them focused on coding. The second question introduces the lesson for the day -- creating a remix of their missions.

💻 What is a remix: Slides 3-5, Pages 2-3

These slides and pages discuss what a remix is and how it will help the student learn more about programming while being creative.

💻 Remix Steps:

The remix is organized into 5 steps. Each step has a corresponding section on their log assignment. After every mission, there will be a remix opportunity, and each remix will go through the same five steps. This follows the design process used in many career fields.

- Each student will complete a Remix Log.
- Students could work in pairs through the lesson, or can work individually.
- Students will need the CodeX and USB cable.

💡 **Teaching tip: Step #1 -- Review projects and concepts** (slide 6, page 5)

Students open their programs from the last two missions and review what the program does and the concepts they learned and used. They fill out the information on their log. Take your time on this part. Let the students discuss or share their answers.

💡 **Teaching tip:Step #2 -- Brainstorm** (slides 7-18, pages 6-12)

This section is longer than it will be for future remixes, because it discusses RGB colors and how to use custom colors in their code. Usually a remix will not involve learning new material, but this will make their remix projects more interesting, and they should really enjoy it. Once again, take your time here. You may want to show students the online software for selecting a color and finding the RGB values for the color. Have them practice with you so they can do it on their own when it is time for coding.

After the short lesson on RGB, an optional slide (page) discusses using random numbers to generate a color. This is optional. You can decide if you want to do this slide with your students, or leave it up to them to go over the information.

Then brainstorming is revisited. Four suggestions for a remix are given: one mild, one medium and two spicy. Students can look at a video of a finished remix. They can choose one of those, or come up with their own idea. They will write about their idea in the log assignment.

💡 **Teaching tip: Step #3 -- Make a plan** (slide 19, page 13)

Students plan the variables they need, the colors they will use and the images they will display. Students don't always want to plan, or see the value of planning, but it really will help them code the project. Emphasize this with the students, that this is an important part of the design process.

💡 **Teaching tip: Step #4 -- Code your project** (slides 20-21, page 14)

Students start a new project in CodeSpace. There isn't a mission for the remix, so students will use the sandbox. The icon for the sandbox is in the lower right-hand corner above the toolbox. The earlier objectives may use the simulator, and the code will not run in the simulator. Students should write just a few lines of code at a time and test frequently. They can use their code from Mission 2 and Mission 3, as well as the instructions from any of the missions or this lesson. They don't have to have anything memorized.

💡 **Teaching tip: Step #5 -- Documentation and feedback** (slides 22-23, pages 15-16)

This step has two parts: documentation and feedback. For documentation, students should make their code readable by adding blank lines and comments. Some students are naturally good at this and may have already done it. Other students may need the reminder. The second part is to get a peer to look over the code and give feedback. The student also reviews his/her project and gives feedback. Students are encouraged to read the feedback and use it to improve their project.

🧑‍🤝‍🧑 **Post-Remix Reflection:** (slides 24-25, page 17)

The project is complete and students are asked to reflect using two questions. You can change the questions if there is something else you want to review or emphasize with your students. This is an excellent opportunity to have a gallery walk of all the projects, or have presentations.

Solution code is given in the folder for the four remix suggestions.

💻 Mission Complete:

This mission ends with a completed, working program. You need to decide how you will use the program for assessment. You could:

- Go to each student and check-off their code
- Have the students download their code to a text file and turn it in using your LMS
- Have students print their code (either download and then print the text file, or print a screenshot)
- Have students switch computers and run each other's code. Fill out a simple rubric and turn in to teacher
- Any other way that words for you

End by collecting the Mission Log and any formative assessment you want to include.

A Kahoot! that reviews Mission 1, 2 and 3 is available.

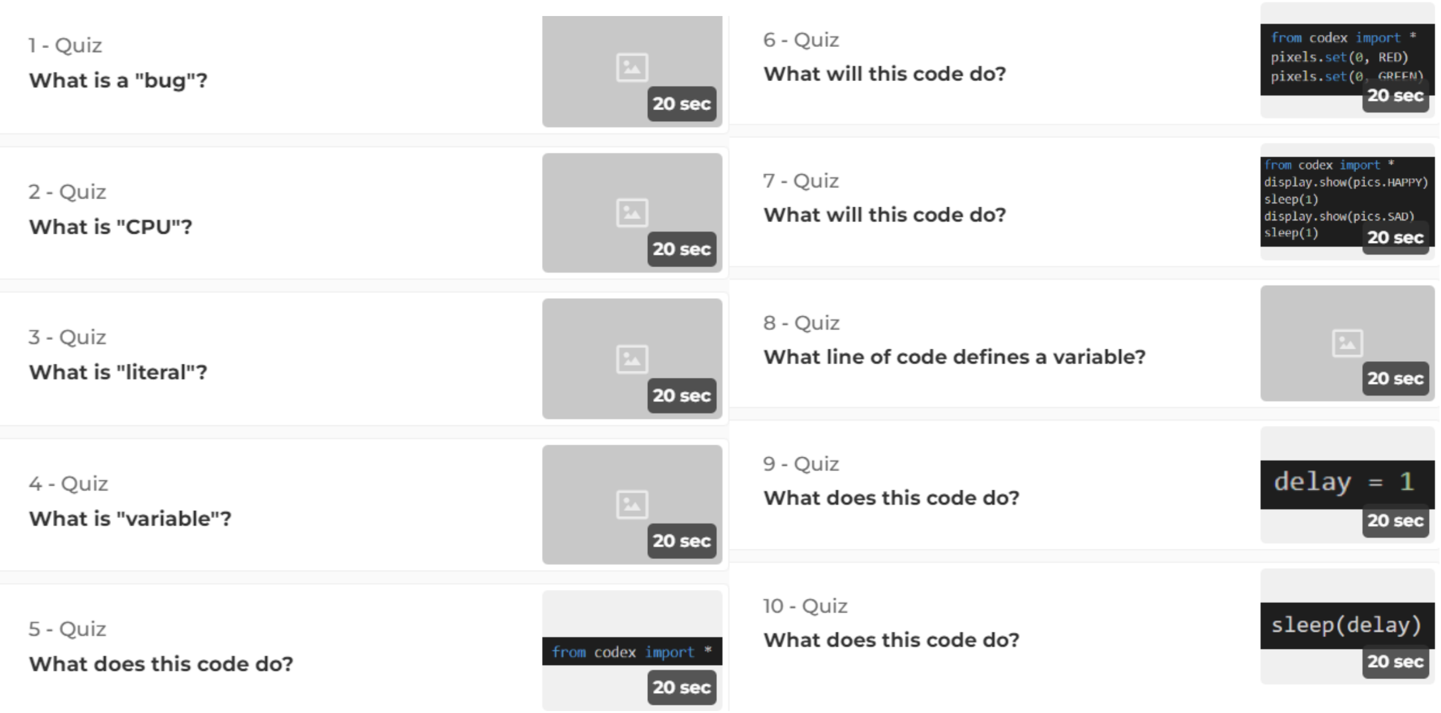
💻 IMPORTANT Clearing the CodeX:

Students should run their "Clear" program at the end of each day before returning the CodeX.

SUCCESS CRITERIA:

- ❑ Write an original program, run it, and save it to the CodeX
- ❑ Follow the design process and document their work in the log assignment
- ❑ Use at least one variable in the program
- ❑ Change the color of at least one pixel
- ❑ Display at least one image on the screen
- ❑ Debug any errors in the code
- ❑ Complete a review of their original program
- ❑ Clear the CodeX of meaningful code

❓ Kahoot! Review



1 - Quiz
What is a "bug"?
20 sec

2 - Quiz
What is "CPU"?
20 sec

3 - Quiz
What is "literal"?
20 sec

4 - Quiz
What is "variable"?
20 sec

5 - Quiz
What does this code do?

```
from codex import *
```

20 sec

6 - Quiz
What will this code do?

```
from codex import *
pixels.set(0, RED)
pixels.set(0, GREEN)
```

20 sec

7 - Quiz
What will this code do?

```
from codex import *
display.show(pics.HAPPY)
sleep(1)
display.show(pics.SAD)
sleep(1)
```

20 sec

8 - Quiz
What line of code defines a variable?
20 sec

9 - Quiz
What does this code do?

```
delay = 1
```

20 sec

10 - Quiz
What does this code do?

```
sleep(delay)
```

20 sec