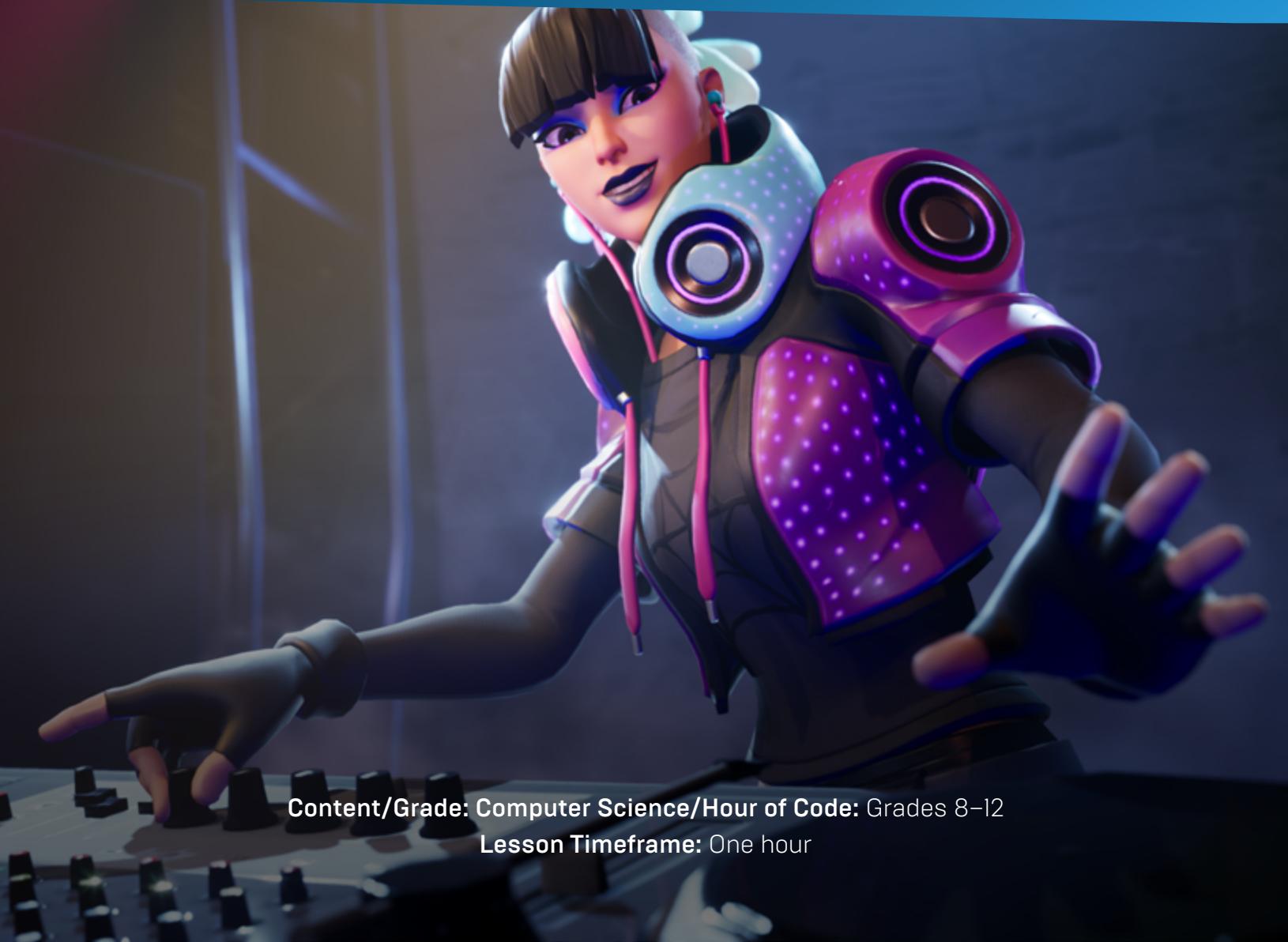


# FORTNITE

## MAKING MUSIC IN FORTNITE CREATIVE: CREATING LOOPS WITH THE MUSIC SEQUENCER



Content/Grade: Computer Science/Hour of Code: Grades 8-12

Lesson Timeframe: One hour

## LESSON/CLASS/GUIDE INFORMATION

Lesson Title: Making Music in Fortnite Creative: Creating Loops with the Sequencer and Music Notes

Content/Grade: Computer Science/Hour of Code: Grades 8–12

Lesson Timeframe: One hour

[Teacher Guide](#)

[Student Guide](#)

## AUTHOR CONTACT

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## DESCRIPTION OF CLASS / LEARNING ENVIRONMENT

This lesson is designed for Hour of Code during Computer Science Education Week. It is designed as a music lesson so it could also be used in a music course. Music composition is an important element in game design, and this lesson provides a great opportunity for students to experience music composition in the context of a game development course. This can serve as a stand-alone lesson, or be used in conjunction with the other activities to complete a larger project.

Author Steve Isaacs teaches Game Design and Development as a quest- or choice-based learning environment that provides students with opportunities to take different approaches to meeting the learning outcomes based on their own interests, in terms of content as well as project options.

Author Brian Dickman studied computer science and operates a full-time game development studio that produces entertaining and educational content inside popular video games.

## LESSON OVERVIEW

Are you a fan of soundtracks in games? Do you have music sequences that play in your head for hours after playing your favorite game? Orchestras have dedicated entire concerts to musical scores from video games. Music is impactful and memorable. Using music in your digital projects can help elevate the audience experience and make your content more engaging.

In this project, you will create a machine in Fortnite Creative to play your own custom music loops!

## DESIRED RESULTS

### WHAT ARE THE LEARNING OUTCOMES FOR STUDENTS?

#### ESSENTIAL QUESTIONS/BIG IDEAS

Can students learn computer science concepts as part of a meaningful activity rather than simply learning syntax as an isolated skill?

Will learning computer science concepts like loops through an activity in Fortnite Creative generalize to understanding the concept in a coding environment?

Will students gain an appreciation for music composition in the context of game development?

Will students show more motivation to learn computer science when the concepts are introduced in a game environment?

#### LEARNING OUTCOMES/OBJECTIVES

The student will be able to:

- Demonstrate an understanding of loops as a computer science concept
- Apply an understanding of loops as a means of musical composition in the context of a game
- Create a looping musical score as background music in a game

## LESSON PLAN

#### LEARNING ACTIVITIES

### HOW TO USE THE FORTNITE CREATIVE HOUR OF CODE LESSONS

This series of lessons has been designed to provide flexibility. Each lesson is set up as a stand-alone lesson to teach a coding concept in isolation in the span of about an hour as part of the Hour of Code initiative. The teacher can choose which lesson students complete or students can choose one (or more) that appeal to them.

The lessons also work together so that a student could complete all five lessons and create a game experience with five different puzzles demonstrating the different concepts. Likewise, students can work in groups where each student or small group completes one of the activities as part of a larger project.

Each lesson is accompanied by a student guide with notes to guide the educator in delivering the lesson and supporting the students in the process.

#### USING FORTNITE CREATIVE:

To facilitate teaching with **Fortnite Creative**, we have developed a short course for educators get familiar with the tool and how to use it in the classroom. We encourage you to take the course and earn the badge!

#### TEACHING WITH FORTNITE CREATIVE ONLINE COURSE:

<https://www.unrealengine.com/en-US/onlinelearning-courses/teaching-with-fortnite-creative>

## INTRODUCTION: LOOPS

**Loops:** In computer science, a loop is a programming structure that repeats a sequence of instructions until a specific condition is met. Programmers use loops to cycle through values, add sums of numbers, repeat functions, and many other things.

– from <https://techterms.com/definition/loop>

For example, if you are on a track that is a quarter mile in length and want to run a mile, you would run around the track four times. This is an example of a loop. Once you have run around the track four times, you can stop.

**Pseudocode** is a way of writing coding concepts in a simple format that is easy for people to communicate and understand. The actual code in different programming languages will have different rules (or syntax), but pseudocode allows us to think about the code based on what we are trying to accomplish.

Here is an example of a loop written in pseudo code.

```
Repeat 4 Times {  
    Run around the track  
}
```

Here are simple videos that explains how Loops work in Computer Science

- <https://www.youtube.com/watch?v=WqmyVZnMWHY>
- <https://www.youtube.com/watch?v=BlXtMr7ge9Q>

Loops can be used in any coding language, and in environments like Fortnite Creative where you can set up a scenario that creates a loop to repeat a command either infinitely, or for a specified number of times.

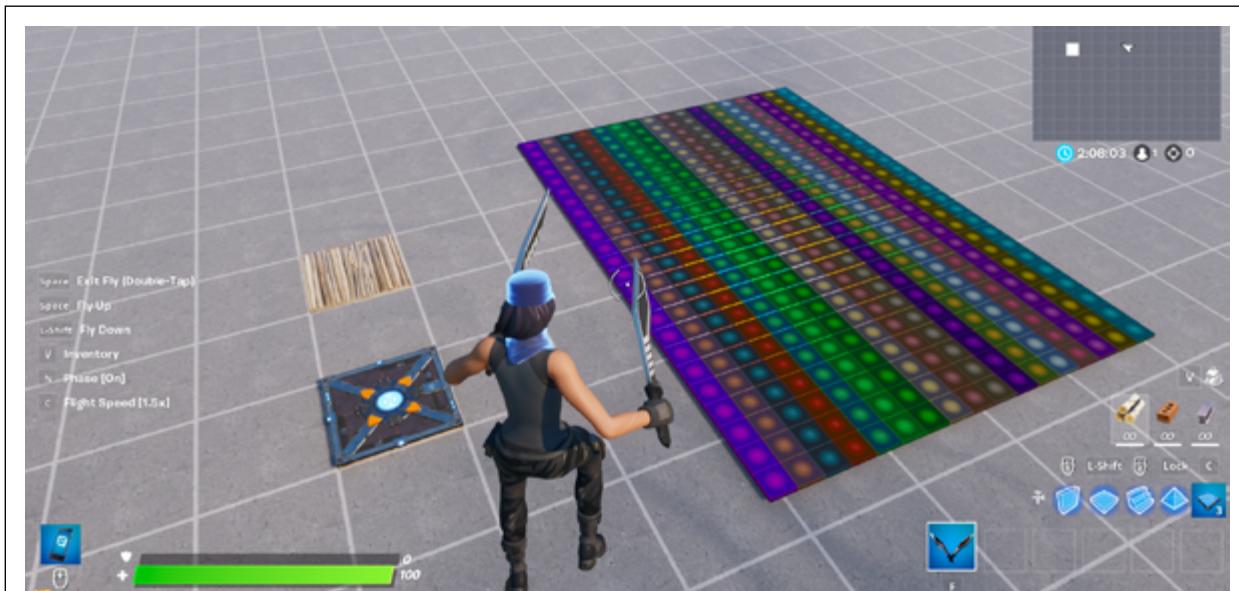
## ACTIVITY

Students will create a looping musical score using the **Sequencer** and **music blocks** in Fortnite Creative.

The Sequencer in Fortnite Creative is a handy device that allows us to create a repeating sequence of events. In addition to running a sequence itself, the device has other attributes that give even more control of how it is used in the game.

The Sequencer can be set to have a three-dimensional volume (width x height x length). When the Sequencer is activated, it will send a pulse from the beginning of the volume to the end. This pulse will trigger any devices or objects in its path. We will use this to play music by placing music blocks inside the Sequencer volume.





Refer to the Student Guide with Teacher Notes for the step by step directions for the activity.

Students should access and work from the Student Guide

## EXTERNAL RESOURCES

Teaching with Fortnite Creative Online Course:

<https://www.unrealengine.com/en-US/onlinelearning-courses/teaching-with-fortnite-creative>

Code.org: <http://www.code.org>

Hour of Code: <https://hourofcode.com/us>

CS Discoveries: Loops: <https://www.youtube.com/watch?v=WqmyVZnMWHY>

Mark Zuckerberg Explains Loops: <https://www.youtube.com/watch?v=BlXtMr7ge9Q>

## ASSESSMENT

### RUBRIC

#### **CREATING A MUSICAL SCORE IN FORTNITE: LOOPS WITH THE SEQUENCER AND MUSIC NOTES**

	Developing	Competent	Proficient	Distinguished
<b>Project Content / Learning Objectives</b>	Project does not convey the required information or understanding as it pertains to the learning objectives.	Project shows a basic understanding of the use of loops when using the Sequencer and musical notes.	Project reflects understanding of loops and combining musical notes to create music that plays in the game.	Project reflects exemplary understanding and application of loops and musical composition.
<b>Project Development / Functionality</b>	Project does not work, or has major flaws that prevent its intended use.	Project demonstrates basic functionality, and has only minor flaws.	Project functions the way the student intended, and accomplishes the task of looping music in the game.	Project is functional and refined, with extra features that exceed the requirement (such as use of chords, activating additional triggers, and so on).
<b>Project Aesthetics / Sound / Design</b>	Project requires more attention to the layout and design, as well as the coherence of the musical notes used.	Project shows some attention to layout/design and music composition, but is incomplete or lacking in some aspects of organization or musical appeal.	Project is well organized and pleasing to the eye and the ear; music composition is well developed and makes sense in the context of the game.	Beautiful design and approach to musical composition. The music really enhances the gameplay experience.
<b>Reflection</b>	Student demonstrates difficulty describing loops and connection between code and this activity.	Student can mostly describe/reflect upon the basics of loops in coding, and has a general understanding of how that translates to this activity.	Student provides a thoughtful reflection on loops and musical composition, and how the functionality works in Fortnite Creative. Student has a good understanding of how this translates to coding in general.	Student can eloquently explain the concept of a loops and the use of music notes to create a musical composition. Student demonstrates a clear understanding of how this activity relates to loops in coding.

## STANDARDS MAPPING

[Common Core Standards](#)  
[ISTE Standards for Students](#)  
[NCSS Standards](#)  
[NGSS Standards](#)

**CSTA Standards for Students:**

<https://csteachers.org/Page/standards>

**1A-AP-10**

Develop programs with sequences and simple loops, to express ideas or address a problem.

**1B-AP-10**

Create programs that include sequences, events, loops, and conditionals.

**1B-AP-12**

Modify, remix, or incorporate portions of an existing program into one's own work, to develop something new or add more advanced features.

**1A-AP-14**

Debug [identify and fix] errors in an algorithm or program that includes sequences and simple loops.

**2-AP-10**

Use flowcharts and/or pseudocode to address complex problems as algorithms.

**2-AP-13**

Decompose problems and subproblems into parts to facilitate the design, implementation, and review of programs.

**2-AP-17**

Systematically test and refine programs using a range of test cases.

**3A-AP-13**

Create prototypes that use algorithms to solve computational problems by leveraging prior student knowledge and personal interests.

**3A-AP-16**

Design and iteratively develop computational artifacts for practical intent, personal expression, or to address a societal issue by using events to initiate instructions.

**3A-AP-17**

Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects.

**3A-AP-22**

Design and develop computational artifacts working in team roles using collaborative tools

## INTERDISCIPLINARY AND 21ST CENTURY CONNECTIONS

This lesson covers areas related to coding/Computer Science.

21st Century Connections:

- Critical thinking
- Creativity
- Collaboration
- Communication
- Technology literacy
- Flexibility
- Leadership
- Initiative
- Social skills

## MODIFICATIONS AND ACCOMMODATIONS

Provide modifications and accommodations as appropriate based on student needs, IEP, 504, etc.

Students can work in teams to integrate a paired programming approach

Sample map can be provided for students to deconstruct / modify

Provide adaptive controller / game controller if necessary.

# **FORTNITE**

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CREATING LOOPS WITH THE MUSIC SEQUENCER**