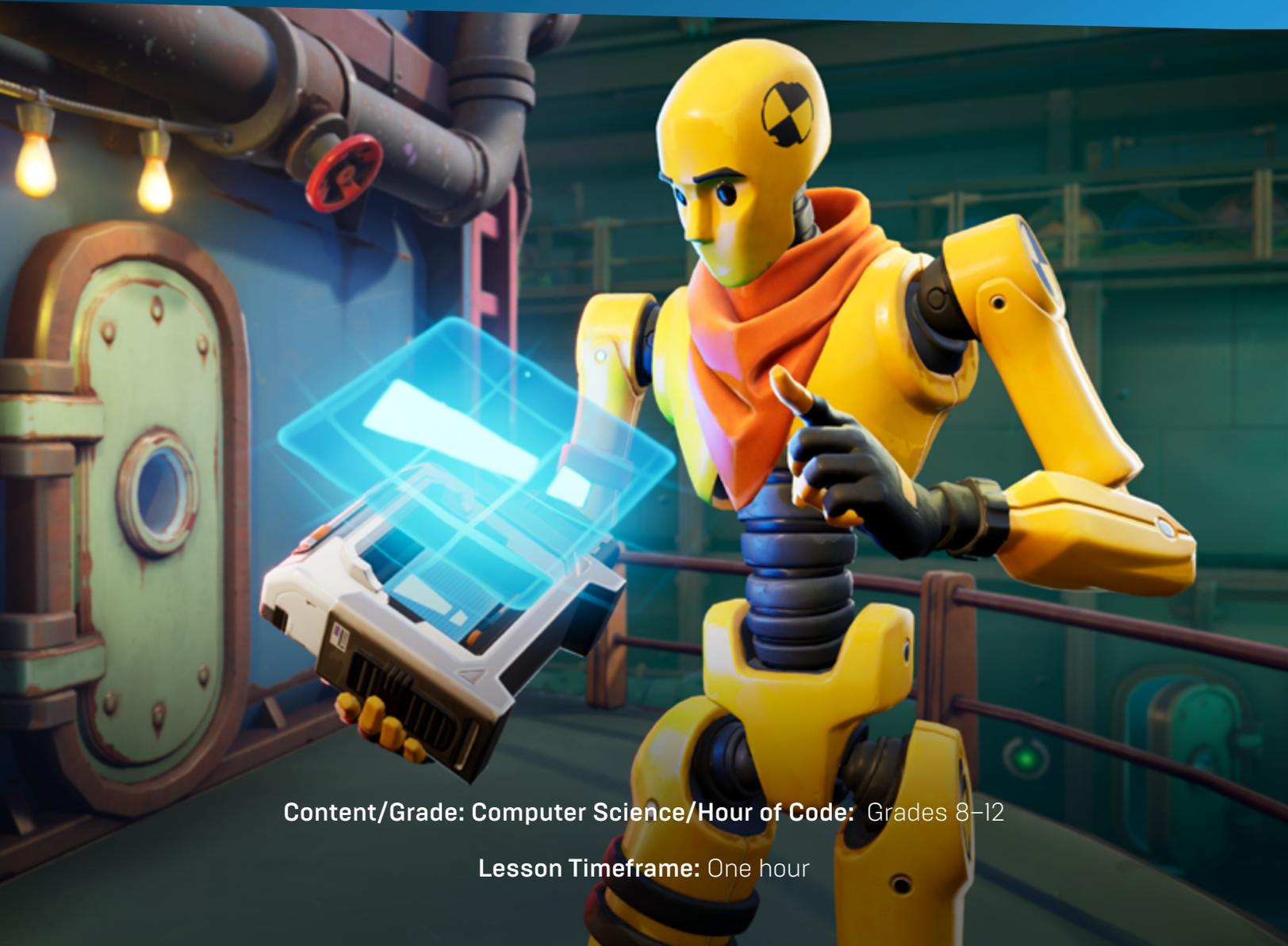# FORTNITE

CONDITIONAL STATEMENTS:
USING THE LOCK AND KEY IN FORTNITE CREATIVE

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

Lesson Timeframe: One hour

LESSON/CLASS/GUIDE INFORMATION

Lesson Title: Lock and Key: Conditional Statements

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

Lesson Timeframe: One hour

Teacher Guide

Student Guide

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DESCRIPTION OF CLASS / LEARNING ENVIRONMENT

This lesson is designed for Hour of Code during Computer Science Education Week. It can be used for any curricular area interested in participating in Hour of Code. It can also be used outside of Hour of Code in a game design or computer science course, or serve as a stand-alone lesson, or 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 of popular video games.

LESSON OVERVIEW

Did you realize that you could learn computer programming concepts in Fortnite Creative? Well, you can!

"IF you finish your vegetables, THEN you can have ice cream." Have your parents ever uttered a statement like this? In coding, we call that a conditional statement. If the condition is met, then the result is activated.

In this activity, you will create a lock-and-key game mechanic where the player has to find a key to unlock a door that allows the player to advance in the game.

LET'S GET STARTED!

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 conditional statements through an activity in Fortnite Creative generalize to understanding the concept in a coding environment?

Can students learn computer science concepts through game mechanics?

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 conditional statements as a concept
- Demonstrate an understanding of conditional statements as a concept
- Apply the understanding of conditional statements in the context of a game
- Create a puzzle in a game environment that incorporates the use of conditional statements

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 to 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: CONDITIONAL STATEMENTS

CONDITIONAL STATEMENT: a set of rules performed if a certain condition is met. It is generally referred to as an If-Then statement, because IF a condition is met, THEN an action is performed.

From: Computer Hope: Conditional Statement

For example, IF you finish your vegetables THEN you can have ice cream. This example is pretty clear. In order to have ice cream you would have to finish your vegetables.

Here's a simple video that explains If-Then-Else statements:
https://youtu.be/D5fSbCKobko

Conditional statements can be used in any coding language, and also environments like Fortnite Creative where you can set up a scenario that tests a condition and something is activated only if that condition is met.

ACTIVITY

Students will create a puzzle in Fortnite Creative utilizing the item spawner and conditional button to demonstrate conditional statements.

In Fortnite, the **conditional button** provides a great example of conditional statements. Conditional buttons can be set up so that a certain item is required to activate the button and in turn, initiate an action.

The **item spawner** can automatically spawn certain **consumable** items. The game designer can indicate which item is required, and how many of that item are needed to activate the button.

For example, the **item spawner** can be set to automatically spawn a slurp fish, and the **conditional button** can require the player to have a slurp fish in their inventory in order to activate. In turn, the conditional button can send a signal to another device to complete the conditional statement. The signal can be received by a lock attached to a door that will unlock when the signal is received. Essentially, any device that receives a signal from a **radio channel** can be activated with a conditional button.

Refer to the Teacher Guide for the step by step directions for the activity.

Students should access and work from the Student Guide to create their own lock and key system.

Upon completion of the guide, students should challenge themselves to incorporate the concept into a puzzle to challenge their peers.

IDEAS/EXTENSION ACTIVITIES:

- Hide the item spawner so that the player has to first find the key before unlocking the door.
- Set it up so the player needs to find a number of items hidden in the world to unlock the door.
- Create a puzzle that requires different keys to open different doors to make it through a short maze.

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

Conditional Statement Video: https://youtu.be/D5fSbCKobko

Conditional Statement Definition: https://www.computerhope.com/jargon/c/contstat.htm

ASSESSMENT

RUBRIC

LOCK AND KEY PUZZLE:

Conditional Statements Through Game Mechanics

	Developing	Competent	Proficient	Distinguished
Project Content / Learning Objectives	Project does not convey the required information or understanding as it pertains to the learning objectives.	Project shows a basic understanding of conditional statements and learning objectives.	Project reflects understanding of conditional statements and coding and how that can be accomplished through game mechanics.	Project reflects exemplary understanding and application of conditional statements through the gameplay. Mastery of the learning objectives are met or exceeded.
Project Development/ Functionality	Project does not work, or has major flaws that prevent its intended use.	Project demonstrates basic functionality, and has only minor flaws.	Project functions in the way the student intended, and provides general guidance for the end user.	Project is functional and refined, with extra features that exceed the requirements.
Project Aesthetics/ Design	Project requires more attention to the look and feel of the experience as well as the general design.	Project shows some attention to aesthetics and thoughtful design, but is incomplete or lacking in some aspects of layout and design.	Project is well organized and pleasing to the eye; the design makes sense in the context of the activity and creates a well-designed experience for the player.	Beautiful design. The environment is inviting, and provides the user with an engaging world to explore in order to experience the puzzle activities.
Reflection	Student demonstrates difficulty describing conditional statements and the connection between code and this activity.	Student can mostly describe/reflect on the basics of conditional statements, and has a general understanding of how that translates to this activity.	Student provides a thoughtful reflection/ explanation of conditional statements, and how the functionality works in Fortnite Creative.	Student can eloquently explain the concept of a conditional statement, and describe how to create a functional conditional in Fortnite Creative.

STANDARDS MAPPING

Common Core Standards
ISTE Standards for Students
NCSS Standards
NGSS Standards

CSTA Standards for Students: https://csteachers.org/Page/standards

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.

1B-AP-15
Test and debug (identify and fix errors) a program or algorithm to ensure it runs as intended.

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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