

FORTNITE

BUILDING A TREASURE HUNT RACE: CREATING A SCORING SYSTEM USING VARIABLES IN FORTNITE CREATIVE



TEACHER GUIDE

OBJECTIVE

Students will create a frantic treasure hunting race that will demonstrate an understanding of variables and their use in video games.

BACKGROUND CONTEXT

INTRODUCTION: VARIABLES

VARIABLES: In programming, a **variable** is a value that can change based on conditions or on information passed to the program. Typically, a **program** consists of instructions that tell the computer what to do and data that the program uses when it is running. The data consists of **constants** (fixed values) that never change, and **variable values** (which are usually initialized to 0 or some other default value because the actual values will be supplied by a program's user). Both constants and variables are usually defined as certain data types. Each data type prescribes and limits the form of the data. Examples of data types include an **integer** (whole number) expressed as a decimal number, or a **string of text characters**, usually limited in length.

From: WhatIs.com

For example, in terms of a scoring system, you could set the value at the start for the score to equal 0. Each time a coin is collected, the score could increase by 10. If the player has 100 points or more, they win and the game ends. If not, the game continues until the player has at least 100 points.

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.

In terms of pseudocode, this could look like:

Declare / set variable

```
var score=0
```

Award 10 Points for a Gold Coin

```
Begin Loop
  Check Player for Coin
  Does player have a gold coin?
  If YES, score = score +10
Loop Again
```

Loop Until the Player has 100 points

```
Begin Loop
  Check Player for Coin
  Does player have a gold coin?
  If YES, add 10 points to player score and remove the coin
Loop Again (IF the Score is less than 100)
(Loops ends when a player reaches 100 points)
Which player has 100 points? Announce them as winner!
```

Here are two videos that explains variables in the context of coding:

CS Principles: Intro to Variables Part 1: https://youtu.be/G4IG_PEWfjE

CS Principles: Intro to Variables Part 2: <https://youtu.be/ijjVDBPwAlo>

Variables can be used in any coding language, and also environments like Fortnite Creative where you can set up a scenario where a value can change throughout the game.

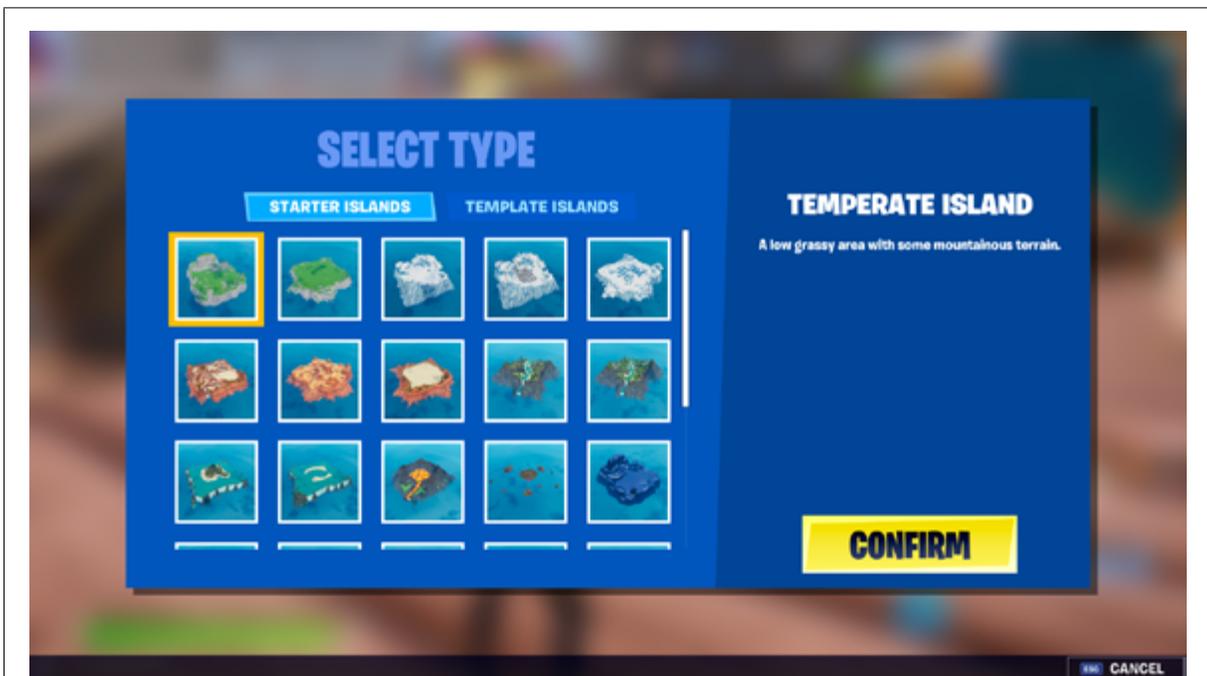
PROJECT OVERVIEW

In order to put the concept of Variables to use, we are going to create a treasure hunting race. Players will race to collect the most points by collecting valuable loot. Be careful, some items will subtract from your score. The player with the highest score at the end of the game will be the winner. (In single player mode, the player will try to reach a score of 100 in the fastest time possible.)

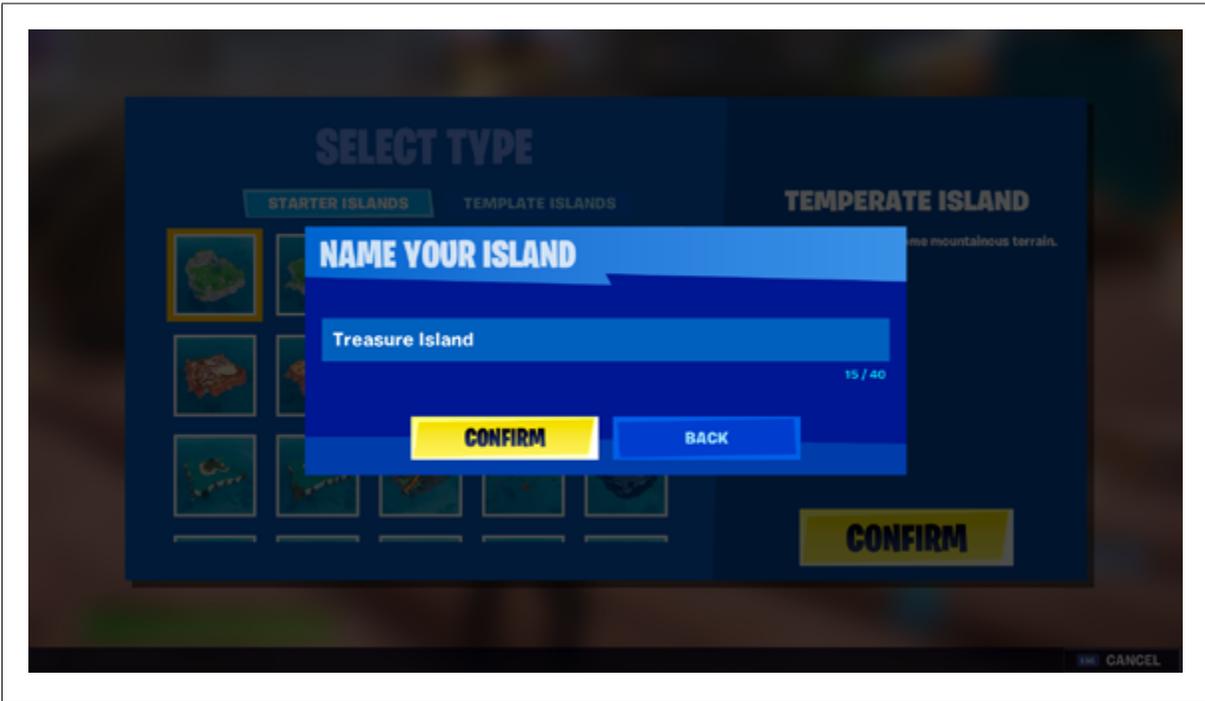
GETTING STARTED

If you need a review on creating your island, refer to the [Getting Started Guide](#)

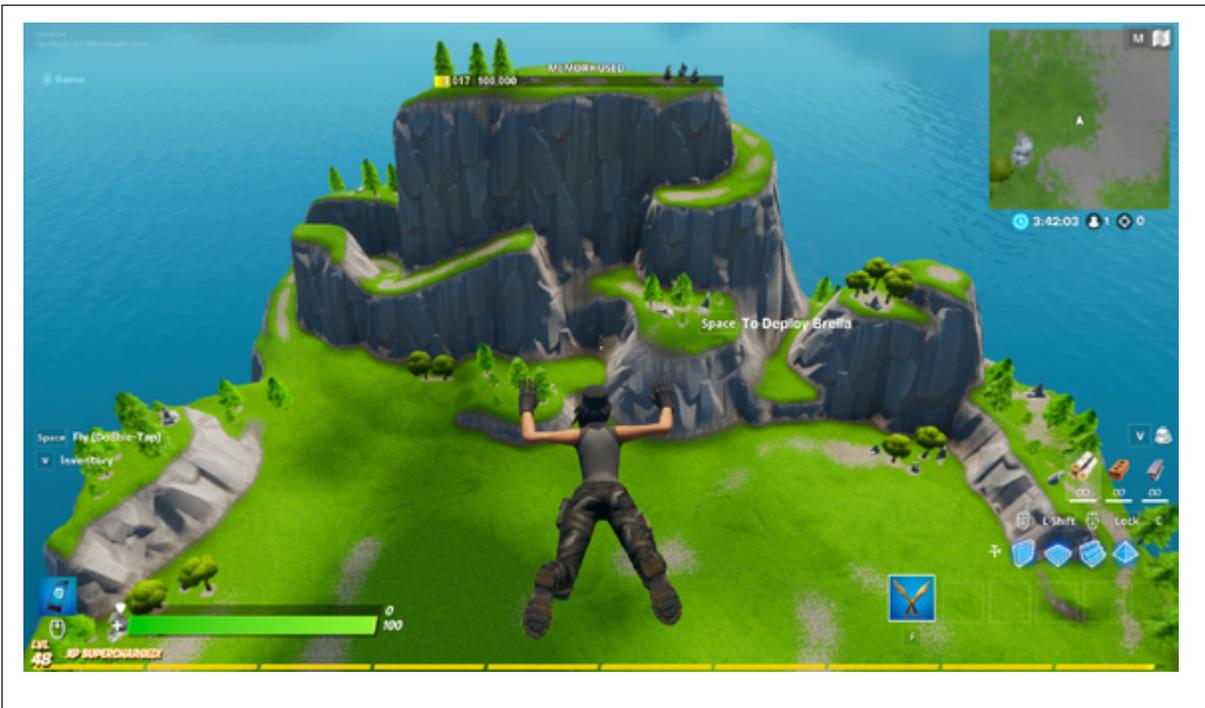
To make this game more exciting, you will start off with a more interesting island. When selecting your island type, choose the Temperate Island option. This island has steep mountain terrain with trails and an open area at the bottom for buildings.



1. When creating a new island, select **Temperate Island**.



2. Create a name for your island. We chose **Treasure Island** as our name.



3. Notice the terrain offered by this starter island. The rugged mountains are perfect for vehicles, while the flat ground offers space for buildings.

STEP 1: PLACING TREASURE ON THE ISLAND

TEACHER NOTES

In this step, students will be accessing their inventory to find the coin to place in the game world. The coin is a collectable item and can be found in the collectibles gallery which happens to be found in the device tab of the inventory.

The gallery can be placed on the island by selecting it in the Quick Bar and left-clicking on the island. Like other galleries, it will place the entire gallery on the island. The creator can use the phone and select/copy the coin. The student will likely want to customize the coin. It is best to paste one instance of the coin, customize it, then copy that coin and paste it so it maintains the customization options.

In this step you will start placing your treasure on the island and customizing it to give each item a unique score value. Let's start by placing the Collectibles Gallery on your island. It can be found in the Gallery tab in the Inventory.



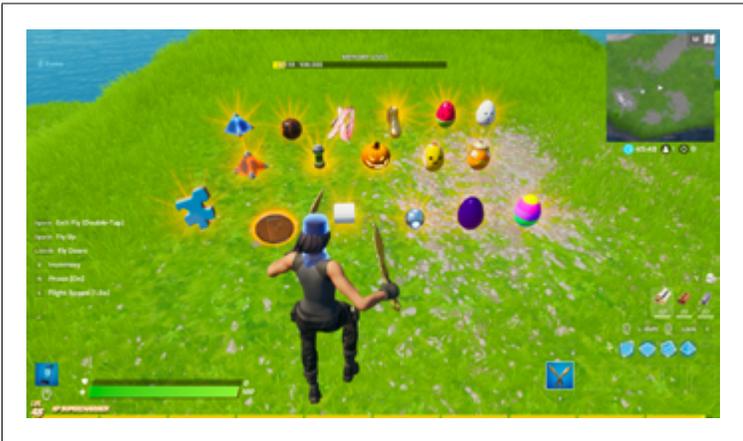
Collectibles Gallery

The Collectibles Gallery has a variety of objects that can be placed on the island.

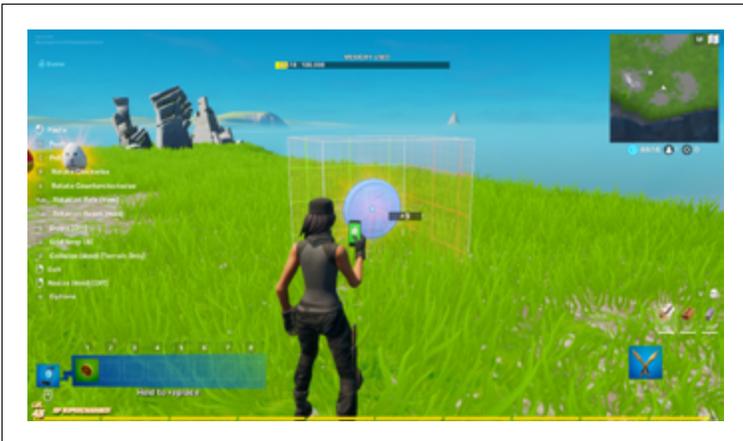
When the player touches these objects in the game, the object can disappear and add points to the player's score.



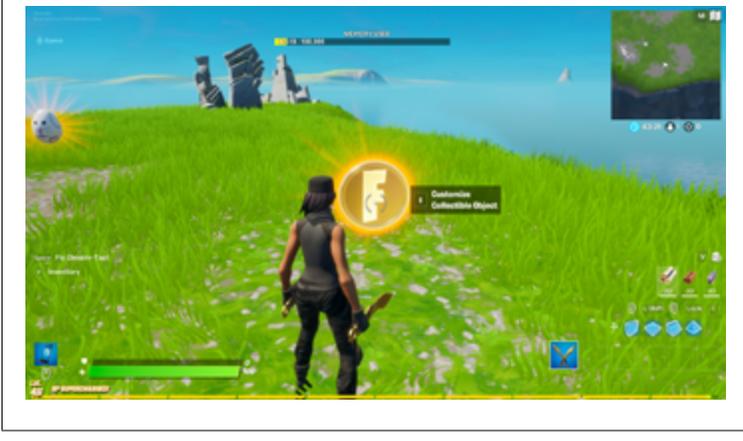
Place the Collectibles Gallery in an open area on your island.

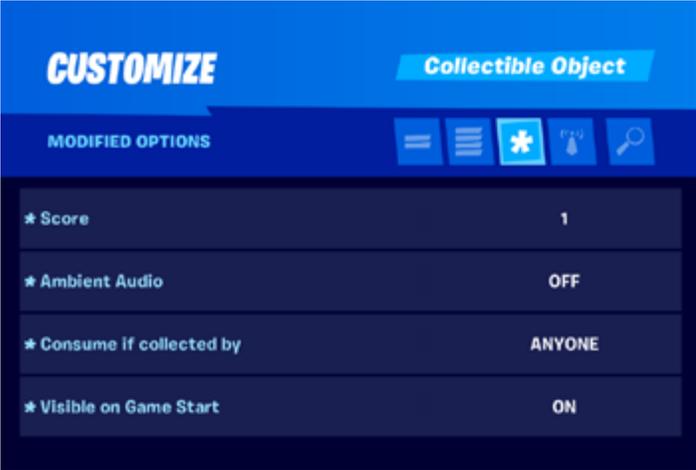


Use your Phone tool to copy the gold coin.
Delete all other collectibles except the **gold coin**.



Customize the settings for the gold coin.
This will be the master coin that you copy around the island.



	<p>Customize the Score value to 1, so the player gets one point added to their score for each coin collected.</p>
	<p>Once you've saved your customized coin, place a few copies.</p> <p>In this example, we placed 6 coins based on the master coin.</p>

STEP 2: BUILDING YOUR SCORING MECHANISM

TEACHER NOTES

In this step, students will set up the scoring system for the game. The idea is to set a winning scenario based on a certain number of points (in our example, this will be 100). This game will be set up to incrementally award points (score) as the player collects coins. If the player gets up to 100 points, that player will win. This example will also use a time limit so the game will also end if the time limit is reached. The student guide provides step by step directions in terms of these settings. Settings for this will take the student to the island settings. This is different from just customizing an item. In this activity, we will be working with the My Island settings for Game, Settings, and UI.

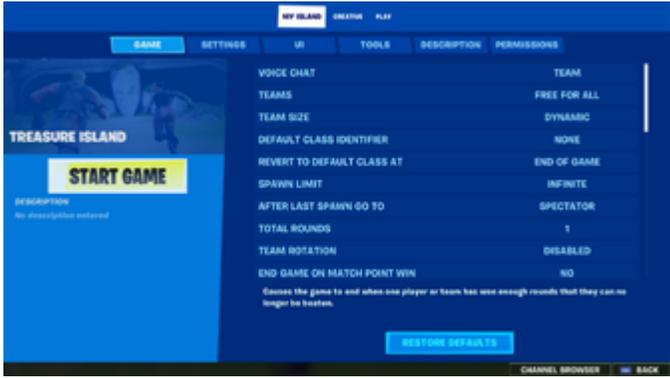
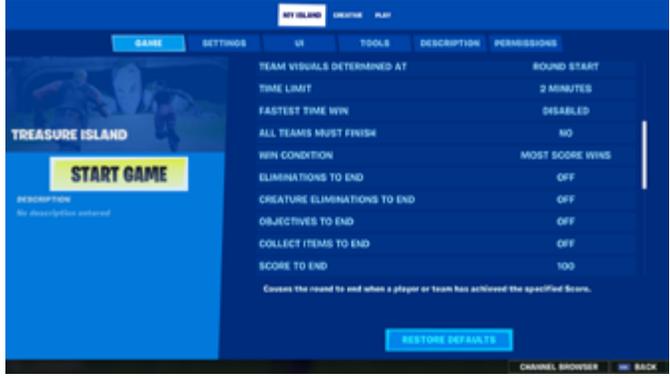
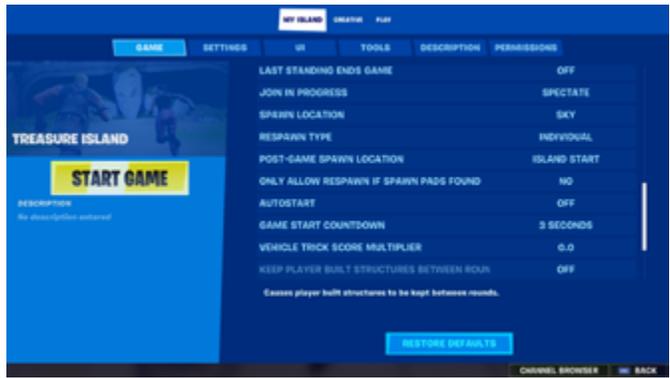
* Go to your Island Settings by pressing the Esc key on the PC version, then select My Island from the menu on the right.

Now that you have a basic understanding of how to increase the player score, you will need to set up the game to keep track of player scores.

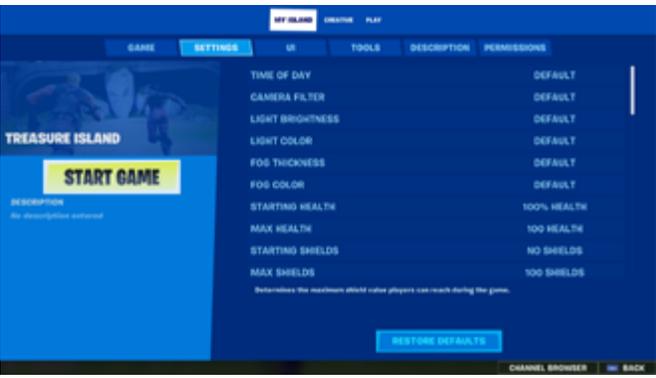
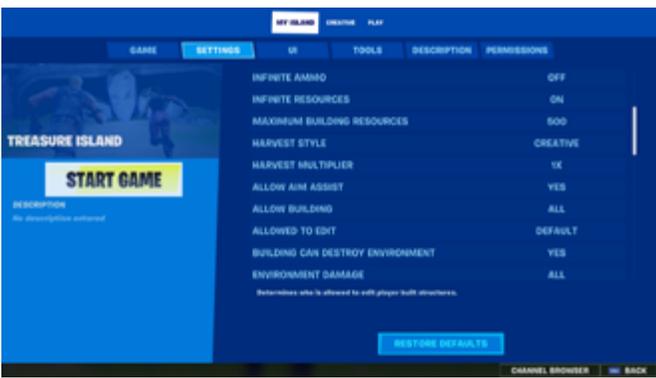
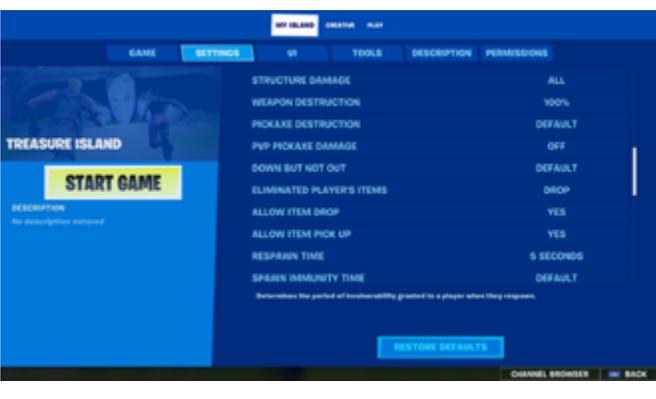
Score is an important variable that will decide which player wins the game. All scores will be initialized to 0 at the start of the game, and the game will end when a player reaches a score of 100. (The game will also have a time limit. In the case where no player reaches a score of 100, the player with the highest score at the time limit will be the winner.)

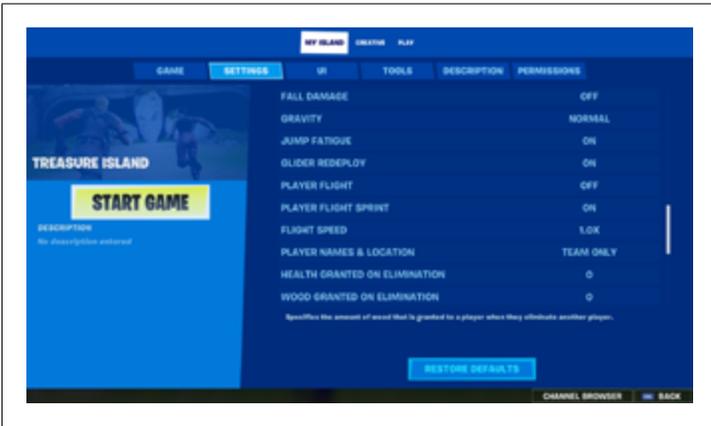
1. Go to your **Island Settings** by pressing the **Esc** key on the PC version.

GAME

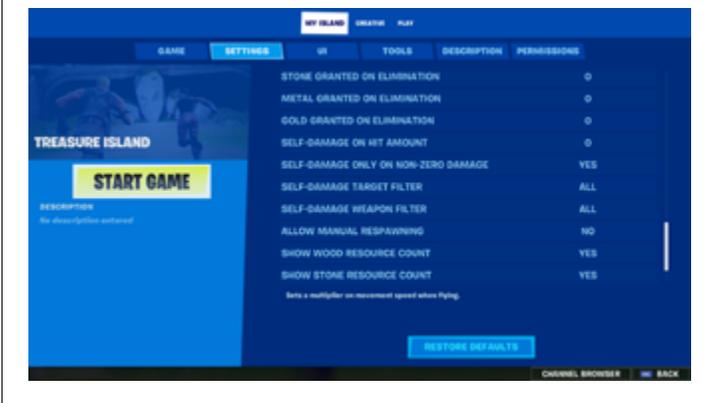
	<p>Teams = FREE FOR ALL</p>
	<p>Time Limit = 2 MINUTES Win Condition = MOST SCORE WINS Score to End = 100</p>
	<p>Spawn Location = SKY Vehicle Trick Multiplier Score = 0.0</p>

SETTINGS

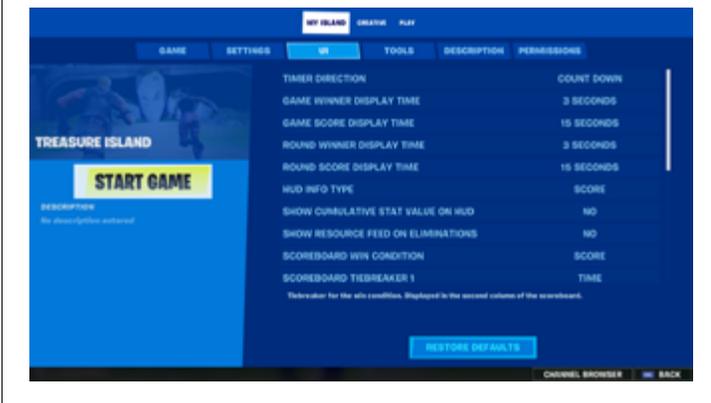
	<p>Defaults</p>
	<p>Defaults</p>
	<p>PVP Pickaxe Damage = OFF</p>



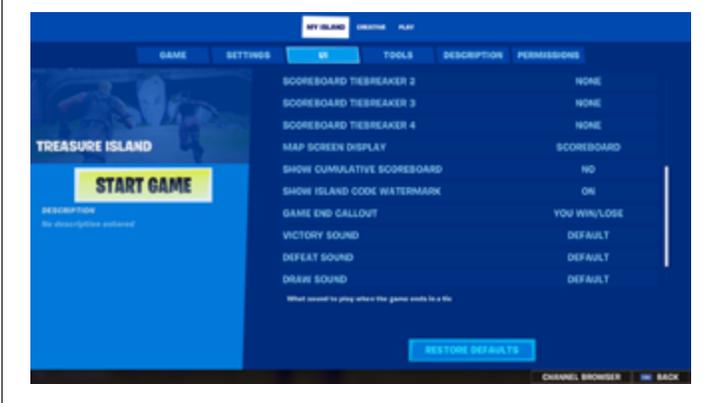
Defaults



Allow Manual Respawning = NO



HUD Info Type = SCORE
 Scoreboard Win Condition = SCORE
 Scoreboard Tiebreaker 1 = TIME



Defaults

	<p>When you have changed all your Island Settings, it's time to test. From the My Island tab, you'll see the Start Game button. Press the button to start a test game.</p>
	<p>At the start of the game, notice that your score is shown below the mini-map in the upper right corner. It should show 0/100. Your score is initialized to 0 at the start of the game.</p>
	<p>After collecting the 6th coin, your score is updated to 6/100. Your current score is 6. The game will end when a score of 100 is reached, or when time remaining is 0:00.</p>
	<p>When you are done with the test, you can select End Game from the My Island tab.</p>

ACTIVITY

TEACHER NOTES

Now it is time to place coins around the island to test that the scoring system is working. Testing the game mechanics and reflecting on the process is an important part of the iterative design process. During this phase, students will be able to observe whether the game functions properly, is too difficult or too easy, fun to play or tedious, and so on. It is also important to have peers test the game and provide feedback.

Some thoughts for reflection when testing the game:

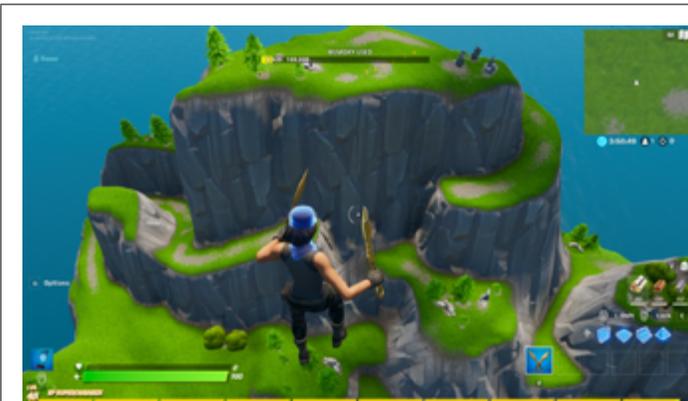
How many coins did you collect?

Do we need to change the speed? [Increase player speed or add vehicles]

Do you need to add more coins?

Is 2 minutes a good amount of time?

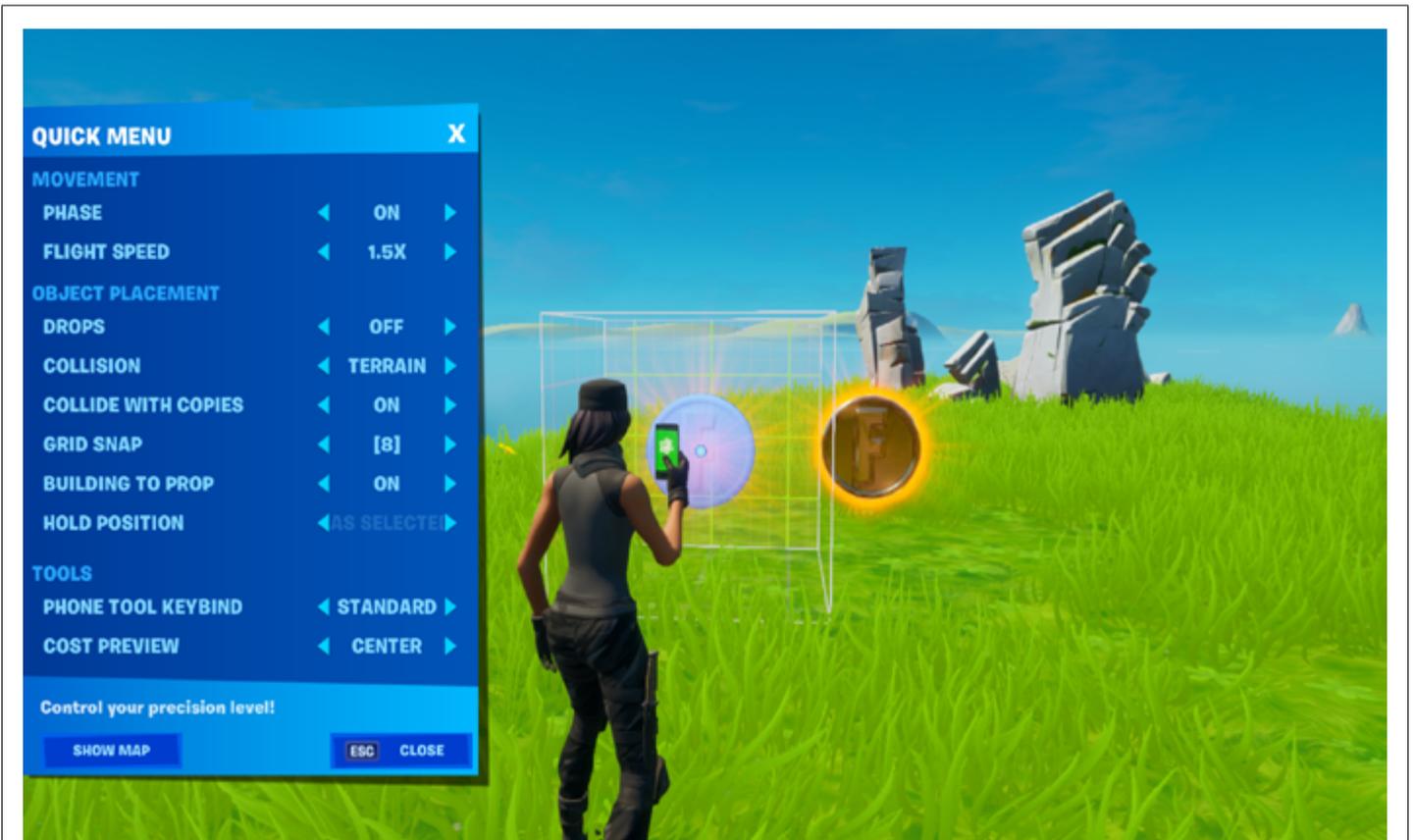
Let's spend a little time placing coins around the mountain area of your island.



This is the mountain area of Temperate Island. You will target the grassy areas for placing coins.



Since you have already customized and tested your coins, copy and place (paste) copies of that coin around the mountain. Each coin should be worth 1 point. [You will create special objects of different values later.]



When placing several copies throughout the island, there are some settings that it is helpful to remember:

Drops—If this is **ON**, placed objects will fall and land on a solid object below. If this is **OFF**, objects will stay where they are placed.

Collision—**NOTHING**: Objects can be placed inside or overlapping other objects. **TERRAIN**: Objects cannot be placed too close to the terrain. **EVERYTHING**: Objects cannot overlap anything in the map. (It is recommended to use TERRAIN or EVERYTHING for most cases.)

Grid Snap—We recommend starting with a number of [8] and increasing it if you need more precise control of where you are placing objects.



This image shows an example of what the island looks like when placing coins around the grassy areas of the mountain region.

TEST PLAY

Once you've placed the coins, try a test round.

- How many coins did you collect?
- Do you need to change the speed? (Increase player speed or add vehicles.)
- Do you need to add more coins?
- Is 2 minutes a good amount of time?
- Remember to add more coins after you add buildings on the ground.

STEP 3: PLACING NEGATIVE ITEMS ON THE ISLAND

If you would like to make your game more challenging, you can add objects that subtract from the player's score. Hide these among the gold coins to add more excitement to the game.

TEACHER NOTES

This step will provide an opportunity to go a little deeper into the use of variables and changing the score. We will introduce the score manager and include a device that will subtract from the score, adding a challenge for the player. In this example we will use the cylinder, which can be found in the collectibles gallery where we found the coin.

We will not be associating score with the cylinder directly, but will set the score manager to subtract 10 points when the signal is sent from the cylinder when it is collected. Thus, the player will collect the cylinder, which will be customized to send a signal to a channel. The signal will be received by the score manager, which will deduct the score. This will all be explained step by step below.



Score Manager



Collectibles Gallery

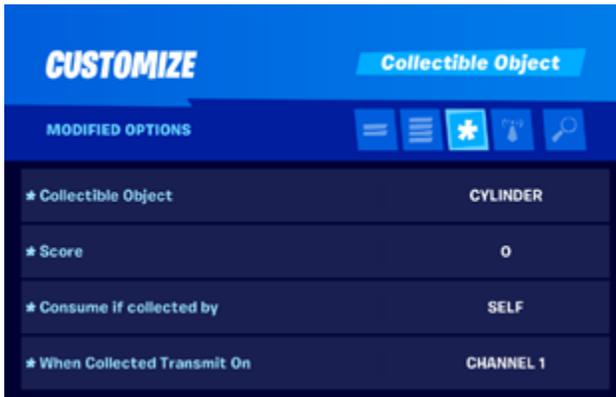


Place the Score Manager device on your island. (It will be invisible during the game.)

Place the Collectibles Gallery and delete all items except the **cylinder**.



Customize the settings of the cylinder.



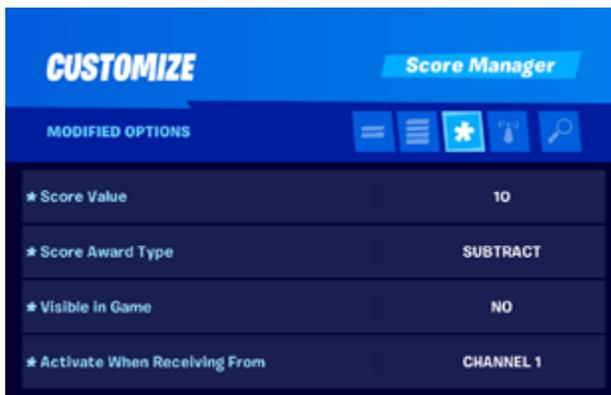
Set the **Score** to 0.

Consume if collected by Self will keep the cylinder in place for each player to pick it up.

When the cylinder is collected by a player, a signal is sent on Channel 1. This will trigger the subtraction from the triggering player's score.



Customize the Score Manager device.



Set the **Score Value to 10** with a **Score Award Type** of **Subtract**.

Activate **When Receiving From** Channel 1 will apply -10 to the score of the player that triggered the event. (In this case, picking up the cylinder.)



The appearance of the Score Manager device will change to show that it is set to subtract 10 from the player score.



Now, let's copy the cylinder that has been customized to trigger the score subtraction.



Place copies of the cylinder around the map to penalize players who are not careful.

STEP 4: ADDING BUILDINGS FROM PREFABS

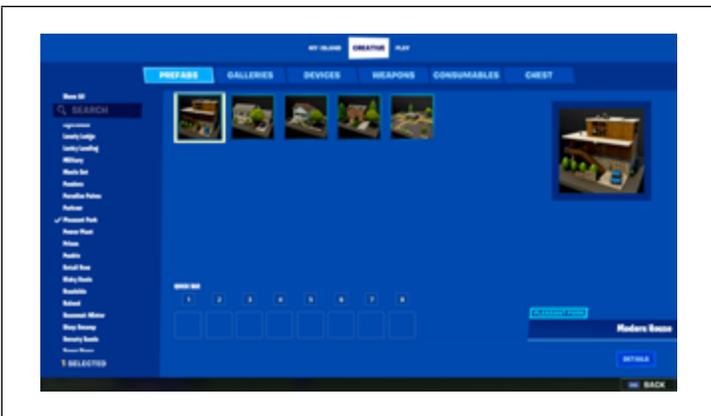
TEACHER NOTES

Prefabs in Fortnite Creative allow us to place beautiful, fully constructed buildings (or parts of buildings) on the island. There are a wide variety of prefabs to choose from, and they make it easy to make a visually stunning (and thematic) environment.

The creator can choose the prefabs, equip them, then place them in the game by left-clicking on the desired spot on the island. This step is intended to provide the creator with the opportunity to create an aesthetic environment for the treasure hunt game.

You will add some buildings in the flat area for more interest, and to create more challenges to navigate.

The best way to quickly build structures in Fortnite Creative is with **Prefabs**. Prefabs are fully constructed buildings that just need to be placed on your island.



You can select from any Prefabs you like.

In our example, we chose **Pleasant Park** to create a neighborhood atmosphere.

Equipping Prefabs will add them to your **Quick Bar** so they can be placed with your Phone device.

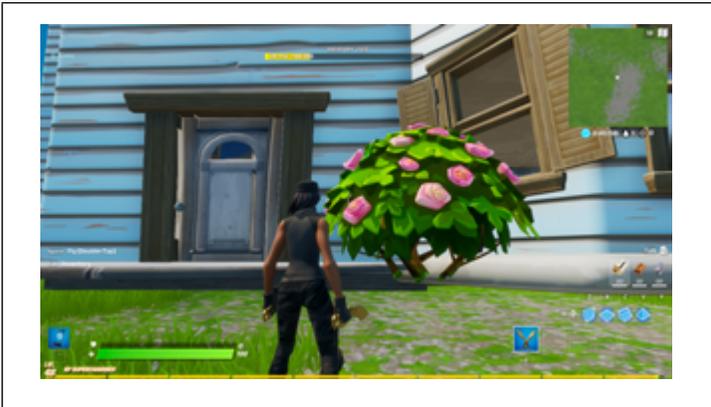


With your Phone device equipped, select the key for the Prefab you'd like to place.

When you select a Prefab, you will see a blue area outlining the space needed for the Prefab.



When placing a Prefab, the front will be facing the player. Make sure your player is in the right position before placing a Prefab.



TIP: Make sure to place your Prefabs on the ground by using one of these techniques:

Before placing the Prefab, press the **(F)** to push the object away from the player.
Use **Options menu B** while holding the phone, and make sure **Drops** is **ON**.

This prefab is floating above the ground—not what you are going for!



STEP 5: ADDING TRANSPORTATION

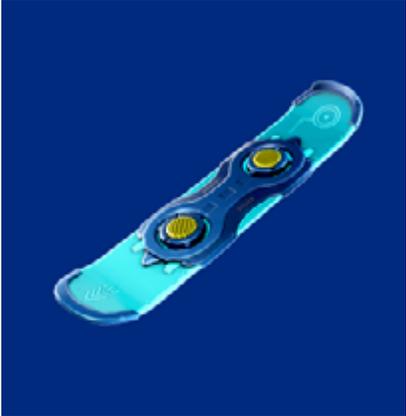
TEACHER NOTES

Fortnite has a number of vehicles that can be driven in the game. To add an element of fun and excitement, students can add vehicles into the game so the player can drive around to collect the items rather than simply run around. Vehicles can be found in the inventory under Devices. Below are three examples, but students can experiment with others. When placed from the inventory, the vehicle spawner is placed on the island. Like other devices, there are a number of ways to customize the vehicle spawn based on signals, respawning, and so on.

This step in the lesson also addresses player speed and creating speed boosts based on picking up a consumable item. This will provide students with ideas for other ways they could incorporate power-ups in their games. This is another example of the use of variables.

Let's make this a little more interesting! Placing some vehicles around the map could help the player collect coins faster...and is just more fun!

Gather the following vehicle spawns from your Fortnite Creative inventory.

		
<p>Driftboard Spawn</p>	<p>ATK Spawn</p>	<p>Quadcrasher Spawn</p>

RECOMMENDED VEHICLE PLACEMENT:



Driftboard Placement

Consider placing the Driftboard at the top of the mountain area.



ATK Placement

The ATK is slower, but easier to control, so it would be good around the neighborhood.



Quadcrasher Placement

The Quadcrasher is faster and has a turbo boost, so consider placing it in the outer areas, away from the houses and the mountain.

INCREASE PLAYER SPRINT SPEED

Make sure you know the controls to get your player to sprint. (While running, tap the **Shift** key.) Here is a tip if you would like to give players an additional speed boost.

	<p>Delete all items except the red chili pepper.</p> <p>Copy the pepper and place it anywhere on the map.</p>
	<p>Eating the pepper will increase the player sprint speed for 60 seconds.</p>

STEP 6: PLAY TESTING

TEACHER NOTES

Play testing and peer feedback is a very important part of the game design process. In this activity, it is definitely important that students test their own games so that they can make sure their variables and scoring system are working properly. Ideally, students will also have an opportunity to have their game played by their peers. This helps provide insight as to how the game is perceived by others, what changes the developer can make to make the game better, and of course, what bugs the player might find that need to be addressed.

Creating a well-balanced game is a time-consuming but rewarding process. You may not have time to fully balance your game, but hopefully you will have time to play it. This process is valuable to determining if it is too easy or too difficult. After each test, you can make adjustments based on your observations before trying again.

If you have the time and resources, get someone else to try your game. Ask for their feedback.

With the power of variables at your fingertips, you can easily change values that modify the way the game works.



EXTENSION ACTIVITIES

If you have more time to work on your project, try the following challenges:

- Add new items that have a different score value.
- Increase the player sprint speed using a **Device**.
- Adjust the game so a single player can complete the goal before time runs out.
- Use a Score Manager device to reset the player score to 0 when collecting a special item.

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