

FORTNITE

FUNCTIONS IN FORTNITE: CREATING A TOWER ESCAPE TRIVIA GAME



STUDENT GUIDE

Objective

After completing the lesson, you should be able to:

- Demonstrate an understanding of functions as a Computer Science concept
- Apply the understanding of functions in the context of a game
- Create a puzzle in a game environment that incorporates the use of functions

Overview

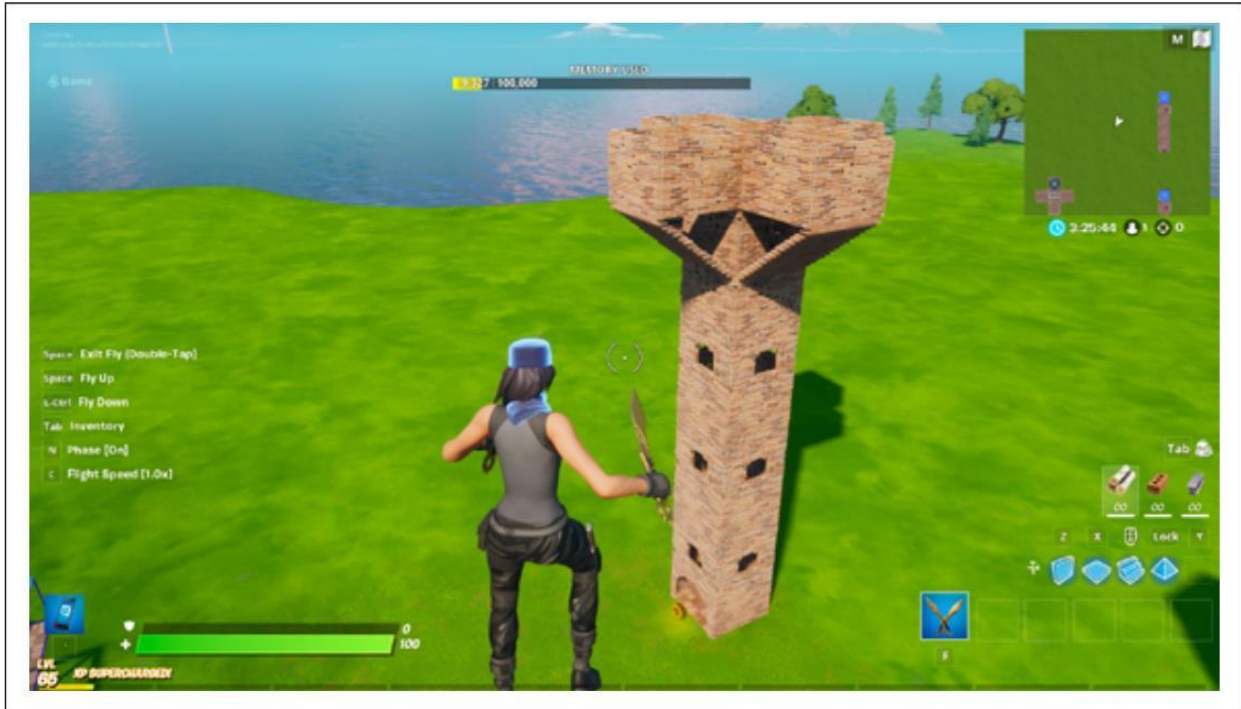
Do you have what it takes to escape the Trivia Tower? Better yet, do you have what it takes to create a trivia tower escape game?

This activity will demonstrate the use of functions in Fortnite Creative as you are tasked with creating a game that requires the player to answer a number of trivia questions in order to escape. Each correct answer will trigger the function to allow the player to advance along with a rewarding tune and visual effect. Incorrect answers will trigger a not-so-pleasant sound and visual effect and require the player to try again.

By completing this activity, students will understand the basics of functions as they relate to coding through the use of the sequencer and a series of devices.

Project Overview

We will be creating a timed trivia game in Fortnite Creative. The player will spawn at the top of the tower and will have to escape as quickly as possible by answering trivia questions correctly. Hurry, but be careful not to make a mistake! Wrong answers will cost you more time.



Each floor will present the player with a question and matching input buttons. Answering the question correctly will trigger the function that will play a sound, produce a visual effect, and break the floor so the player drops to the next level.



When the coin is collected, the game will end and the player will see their time. Who will be the smartest and the fastest in a game that you created?



Jump in and build your trivia tower. Learn new skills, including the concept of functions and how they are used in computer programming.

Getting Started

Step 1: First Floor

Our tower is going to have three floors with different trivia questions. We are going to start by creating the first floor and repeating that process to quickly build the other floors.

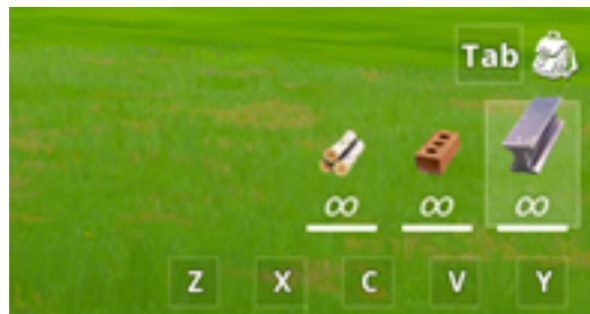
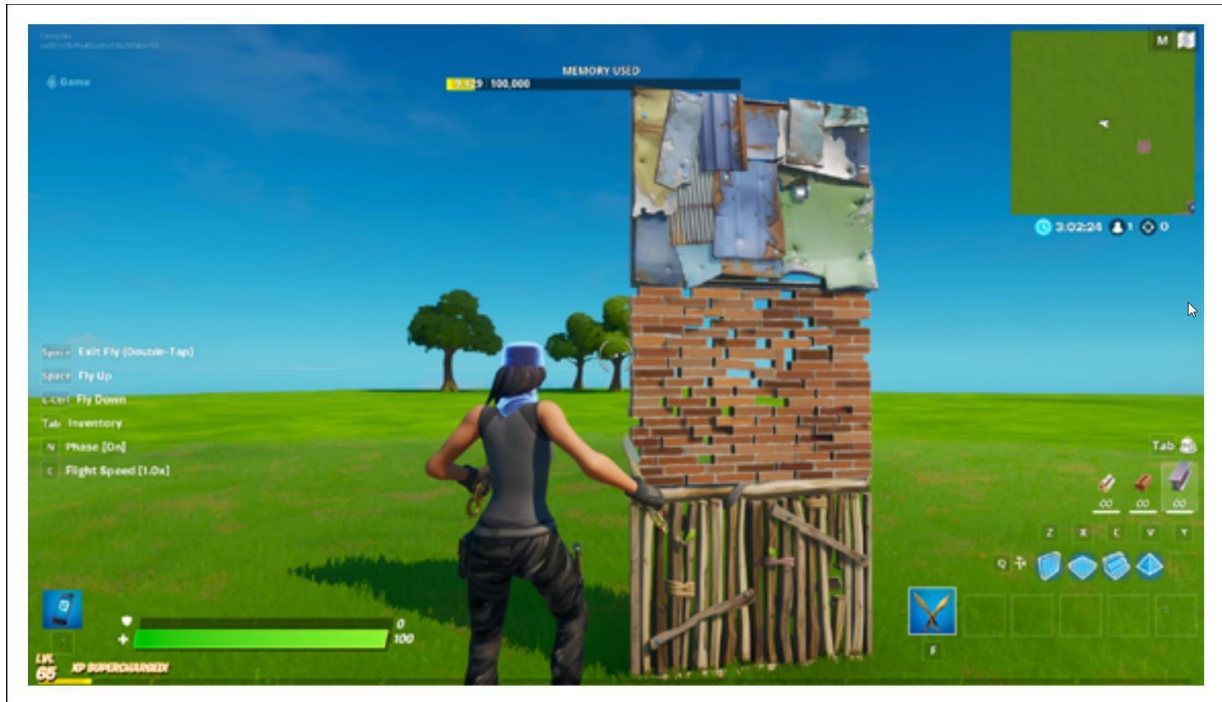
REPETITION IN COMPUTER PROGRAMMING

Computers are fast and can handle repetitive tasks quickly. One common structure for accomplishing repetitive tasks is known as a loop. (Check out the Hour of Code lesson, [Create a Music Machine in Fortnite Creative](#), for more information on loops.)

Another way to handle repetitive tasks is to group them together in a function. Whenever you need a specific set of tasks, you can simply run the function instead of repeating the same commands throughout your computer programs.

Supplies Needed

There are three standard materials available for in-game building in Fortnite. This image shows a section of wall made from each material: wood, brick, and metal. Choose the material that you want for your tower. We used brick.



You can access the different building elements by pressing the key/button mapped to that element.



When placing building material, you will see the mapping for MATERIAL appear next to your building element. Pressing this will cycle through the different building materials. (In this example, the right mouse button will cycle through the materials.)

Building the Frame for Your First Floor



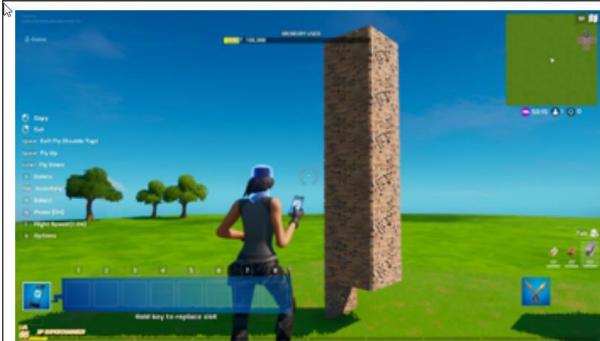
Build the frame for a floor matching the build in the image. You may use the material of your choice.

Important Details

Your structure should be four walls high. There should be a floor in the middle. It should only be one floor in length and width. Complete three sides only, to easily access the inside.

When you complete your structure, proceed to the next step.

Beware!



When creating structures with building materials, they must be anchored to the ground.

We recommend that you create an anchor composed of multiple pieces that are in contact with the ground.

There is only one wall holding this tower. If that wall is broken, the entire tower above it will be destroyed. There is no Undo button to return it to its prior state.



This image shows the tower crumbling when the pieces contacting the ground are removed.

Step 2: First Question

Do you know the theme of your trivia questions? You do not need to know right now, but you will want to figure that out for later. In this step, you are going to add the essential elements needed to show the question and get the player's answer.

Devices Needed

Go to the Devices tab and gather the following items for your inventory.

	
<p>Billboard</p>	<p>Button</p>
	<p>Use the Equip button when selecting each device.</p>
	<p>You will see the Devices appear in your Quick Bar. You can use your Phone tool to place items from the Quick Bar onto your Island.</p>

Placing Devices

Before we jump into placing the devices, change some settings that will make the process easier for you.

When holding the Phone, press the key/button for the Billboard in your Quick Bar. In our case, we press 1. Notice the options on the left side of the screen. Make sure you have some helpful options set.



Set **Drops** to **Off**.
This will make items stay where you place them instead of dropping to the ground.

Set **Grid Snap** to **32**.
This will lock your movements along a grid to make alignment easier.

Set **Collision** to **Everything**.
This will prevent you from accidentally placing devices inside walls.



Select **Options** and make sure **Building to Prop** is set to **Off**.



Rotating Devices

Depending on the direction in which you are building your game wall, you may have to rotate devices that you place. In the image, note that the black Billboard is backwards (we are seeing the back) and the bottom one is correct.



When placing devices, if your device is backwards, use the rotation commands shown on the left side of your window.

Placing the Question

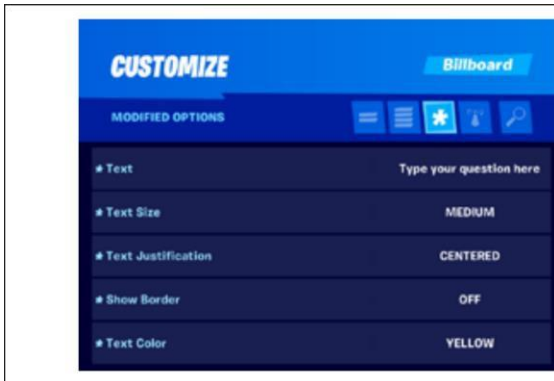
Select the Billboard device with your Phone. Make sure it is rotated correctly and place it on the wall.

Stand on the floor/platform so it can be placed slightly above eye level. (You need to leave space for the buttons and labels under the question.)



Customizing the Question Billboard

Once the billboard is placed on the wall, you can add the text and change its appearance. Get close to where you want to place your Billboard and notice the Customize Billboard overlay on the billboard. Press the key/button shown in the overlay to open the customization options for the Billboard. (Press E, by default.)



Set the customization options for your Billboard. Make sure the question is readable for the player.

We used the following settings. (All other settings are left at the default values.)

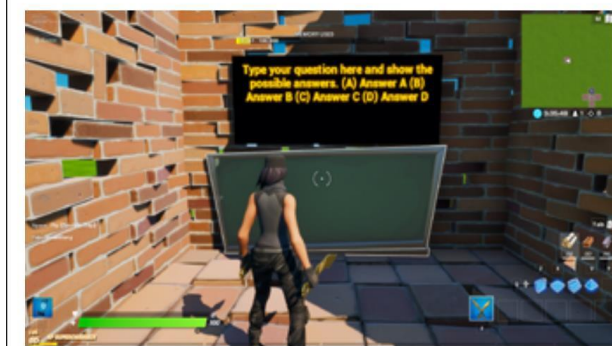


Our question is now in place, let's place the labels for the input buttons next.

Placing the Button Labels



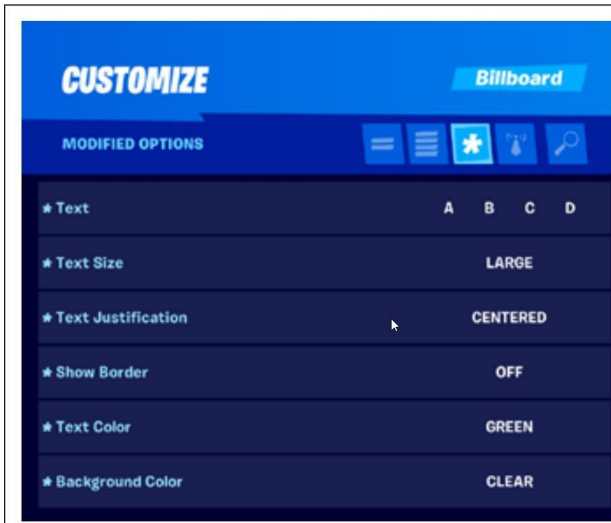
Equip a new **Billboard** (or copy the one from above).



Place the new Billboard directly below the question.

Make sure not to block the question.

Use the Cut and Paste features if you need to move the question Billboard.



Customize the new Billboard to work as labels for the buttons that will be placed in the next step.

In the **Text** field, put 10 spaces between each letter. Make the background invisible by setting **Show Border** to Off and **Background Color** to **Clear**.

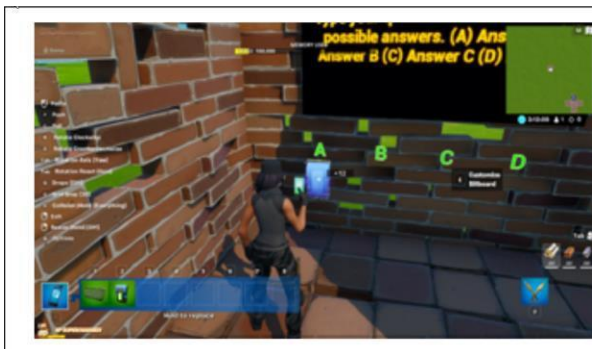


Space labels evenly under the question.

Make sure there is room to add a button to each letter.

Adding the Input Buttons

Now that you have the question and the answer labels, add an input button to each letter.



Equip your **Phone** and select the **Button** from your **Quick Bar**.

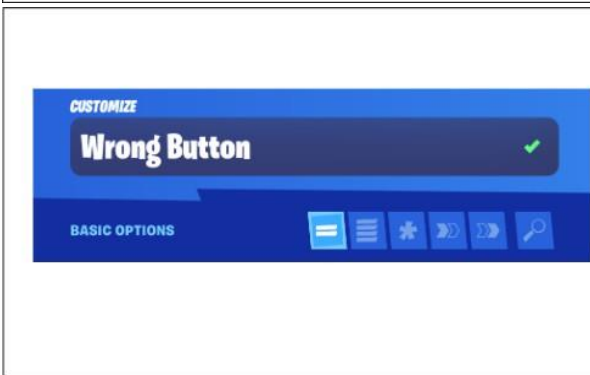
Place the Button in alignment with the answer label.



If you are having trouble aligning, check that **Grid Snap** is set to **32** and **Collision** set to **Everything**.



Continue placing a button at each answer label.



The only value you'll need to change in the button device is to name it.

Make sure that each wrong button is named "Wrong Button X".

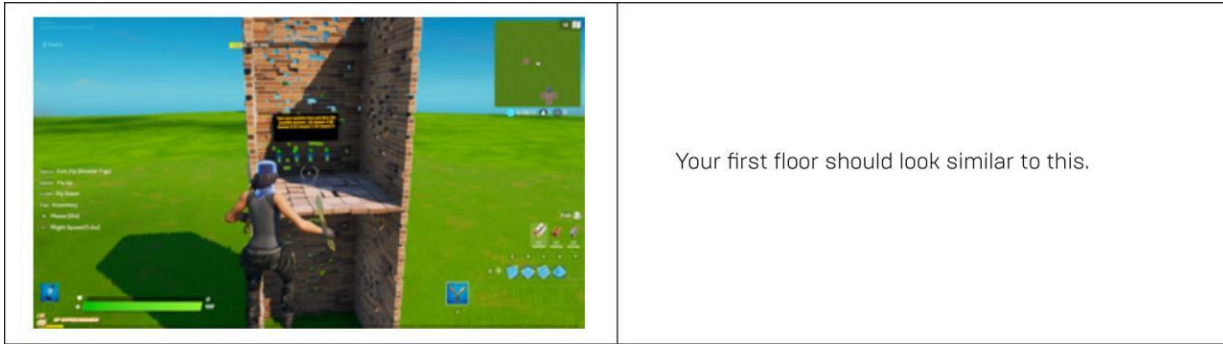
Make sure that each right button is named "Right Button X".

**X is the number for each button starting at 1.*



Make sure that:

- You have completed your first question.
- The billboard for the question is placed just above eye level.
- You have placed labels for the buttons with even spacing.
- Align the buttons with each letter.



Step 3: Wrong Answer Function

When the player guesses the wrong answer, you need to perform a series of actions:

- Turn off the input buttons.
- Change the color of the buttons to yellow.
- Display text on the screen.
- Play a sound for audio feedback.
- Create a brief delay (the penalty for getting an incorrect answer).
- Change the color of the buttons back to green.
- Enable the buttons to accept an answer.

Programming these steps for each incorrect button would be an inefficient process that would be prone to error and difficult to maintain. In a tower with three trivia questions, there would be 9 incorrect answers total. When programming, it is important to create efficient processes and reduce the possibility of errors while making a system that is easy to modify as needs change.

We will be using a Sequencer device to simulate a function in computer programming. We put all the steps needed for a wrong answer in the function and simply point each wrong answer button to this function.

Devices Needed

Go into the Inventory and Equip the following Devices.



Pulse Trigger	Trigger	HUD Message Device
<p>The Pulse Trigger is the heart of our function. We will place actions inside our sequencer zone and it will remotely activate any wrong answer buttons.</p>	<p>The Trigger can be placed in the Sequencer and will be triggered by the activation pulse that travels through the zone of the Sequencer. When triggered, it can send a remote activation to another device.</p>	<p>A Heads-Up Display (HUD) Message Device controls the display of on-screen messages. We will use this to display the text, "Wrong," if the player selects the wrong answer.</p>

FUNCTION COMMUNICATION

Most devices have the ability to send and receive signals via functions. This is used to remotely activate devices or to turn devices on or off.

Since there is no coding interface in Fortnite Creative, we use these functions to string commands together and create conditional actions. These logical structures have many similarities to coding, so you can work with a coding mindset while working in Fortnite Creative.

Placing the Pulse Trigger



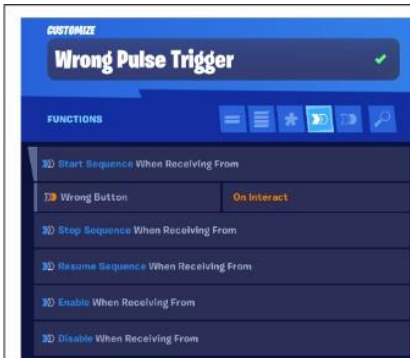
Place the **Sequencer** on the ground

Notice the Sequencer zone will default to the right of your player.



Place floors throughout the Sequencer zone to make it easier to see and also make it easier to place devices inside the zone.

The default size of the zone is 4 tiles. This is fine for our functions.



Within the Pulse Trigger device, you'll need to edit two values.

The first is to name the device to "Wrong Pulse Trigger" so it's easy to know what it is.

The second is to set it to start the sequence when it receives a signal from the "Wrong Button" that you named earlier.

Display Message on the HUD



To display on-screen messages to the player, we need a **HUD Message Device**.

You will use this device to notify the player that they entered the wrong answer.



Place the HUD Message Device toward the beginning of the **Sequencer** zone.



Make sure to name the HUD Message Device with the "Wrong" label at the start.

Type in the message the player will see in the "message" section.

Set it to play the FAILURE 1 sound effect.

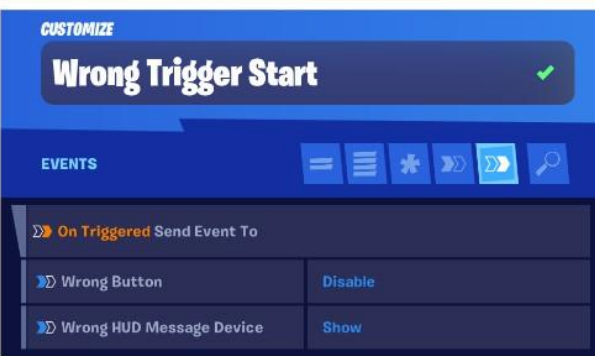
Set the text placement, color, and size.

Set Triggers at Begin and End of Function



Place a **Trigger** at the very beginning of the **Sequencer** zone. Make sure it is inside the zone.

When the Wrong Answer function is called, this Trigger activates. It sends a signal that you will use to activate other devices, like showing the HUD message.



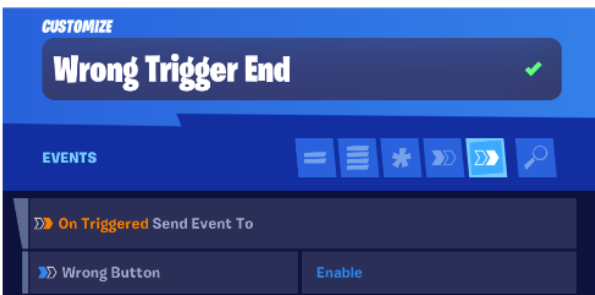
Change the name of the trigger device to "Wrong Trigger Start".

Set the wrong trigger to send an event that disables the wrong button.

Set the wrong trigger to send an event that shows the Wrong HUD Message Device.



Place another Trigger at the end of the Wrong Answer Function.



Change the name of the trigger device to "Wrong Trigger End".

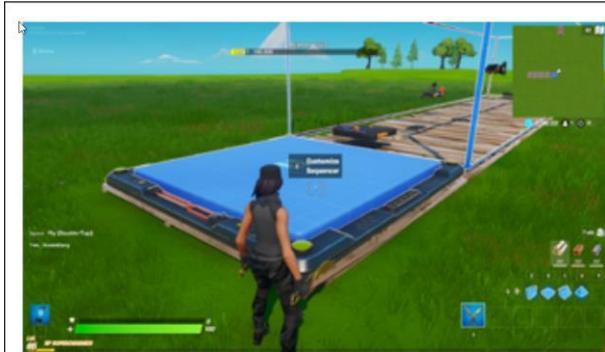
Set the wrong trigger to send an event that enables the wrong button.

This sets the delay to stop a player from spamming the button.

Calling the Function

In computer programming, you would give a function a name. When you reference that function by name, the command inside it will execute.

In Fortnite Creative, you cannot give the function a name, but you can set it to activate when it receives a signal. We will set the Wrong Answer function to execute when a signal is sent from the wrong button in the tower.



Customize the Wrong Answer Sequencer.

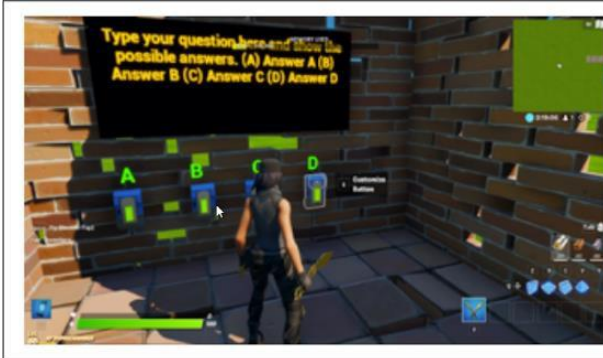
Setting Wrong Answer Input Buttons

If you use a typical multiple-choice trivia question, there is one correct answer and three incorrect answers.

Now that we have a Wrong Answer function, we can simply set the three incorrect buttons to execute this function.



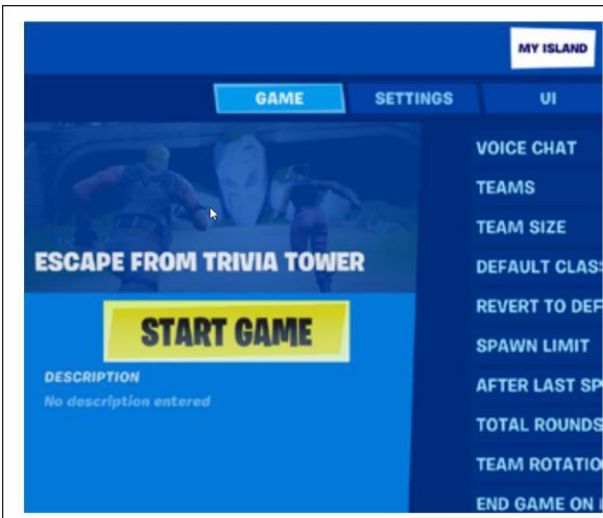
Now, set the wrong button to send an event to the wrong pulse trigger to start the sequence of events that should happen when a wrong answer is input.



Apply these changes to all four buttons.

Later, we'll change the correct answer button to call the Correct Answer function.

Testing Our Wrong Answer Function



To test your game, start it. From the **Inventory** screen, select the **My Island** tab and click **Start Game**.



When spawning into the island, use your glider to land on your first question platform.

If you miss, you can build ramps in-game or hit the **ESC** key and select **Respawn** to try again.



Test each button, which should:

- Disable the input buttons (yellow)
- Display an on-screen message.
- Play a sound.
- Re-enable the input buttons (green).

TROUBLESHOOTING

If the buttons do not perform as intended, it is time for some troubleshooting. Do not let this process discourage you. The act of finding and fixing bugs is a big part of computer programming. Think about what you were expecting and what you observed when you tested it.

- Could it be the button? (Try all four.)
- Is the function getting started? (Are you hearing the sound?)
- Think about the Wrong Answer process as a series of steps. When do the steps stop working? Start from the beginning and move through the steps to the end.

Try to narrow the scope of the problem to a specific area and then double-check the settings in those areas.

After making a small change, test again. Don't make too many changes between testing because you can fix one problem and cause another.

Congratulations, you created a function in Fortnite Creative! Soon you'll be able to increase the size of your Trivia Tower with little extra effort.

Since you are so good at creating functions, build one for the correct answer.

Step 4: Correct Answer Function

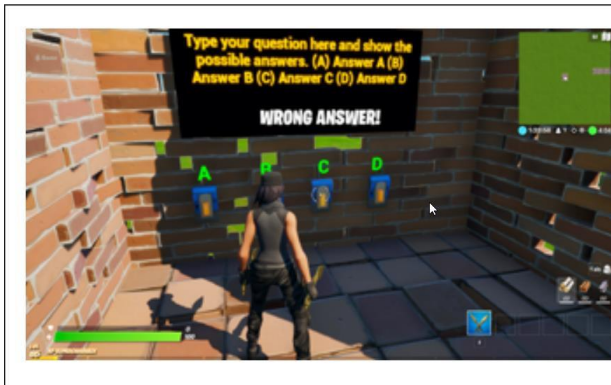
Now that you have successfully created the Wrong Answer function, create the Correct Answer function. This function is different because it will not disable the buttons. Instead, consider a plan to advance the player to the next question as part of the Correct Answer function. Here are the steps of the function:

- Trigger signal at start. (This will activate the HUD message and other possible actions.)

- Display "CORRECT ANSWER!" message on-screen
- Play a positive sound
- Trigger signal at the end. (Hide HUD message and other possible actions)

Use your experience from building the Wrong Answer function to assemble a nearly identical Correct Answer function.

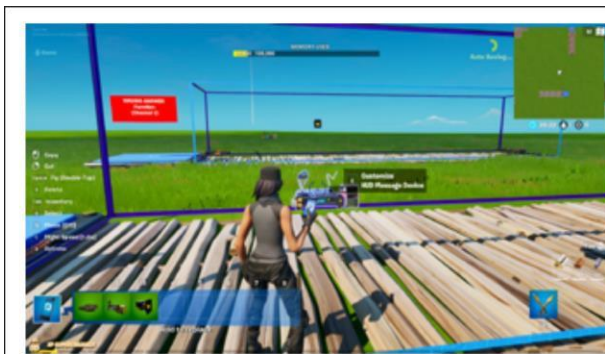
Here is a summary of the steps.



(You can add **Billboards** to label each function.)
Place a new **Sequencer** and fill in the zone with floors.



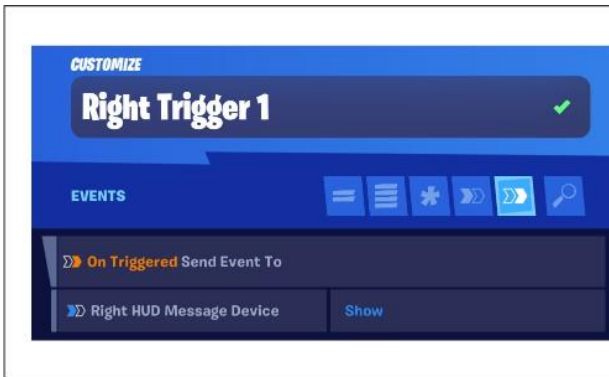
Change the name of the Pulse Trigger device to "Right Pulse Trigger".
Set it to start its sequence when it receives a signal from the Right Button.



Place the **HUD Message Device** and customize it.

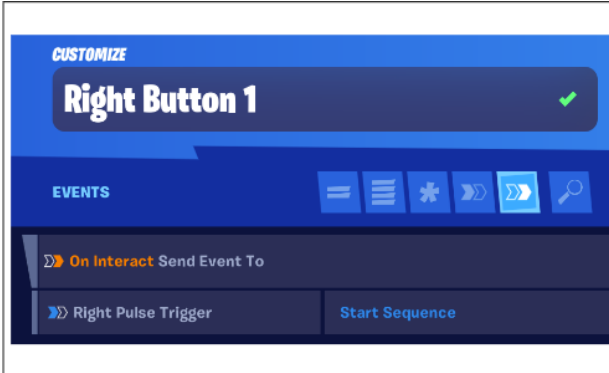


Place the **Trigger** at the start of the correct answer activation zone.



Change the name of the Trigger device to "Right Trigger 1".

Set it to send a show event to the Right HUD Message Device.





Change the name of the correct Button device in your tower to "Right Button 1".

Set it to send an event to the Right Pulse Trigger Device.

Test Your Correct Answer Function

Just as we did with the Wrong Answer function, test this new function and make sure it works before continuing.

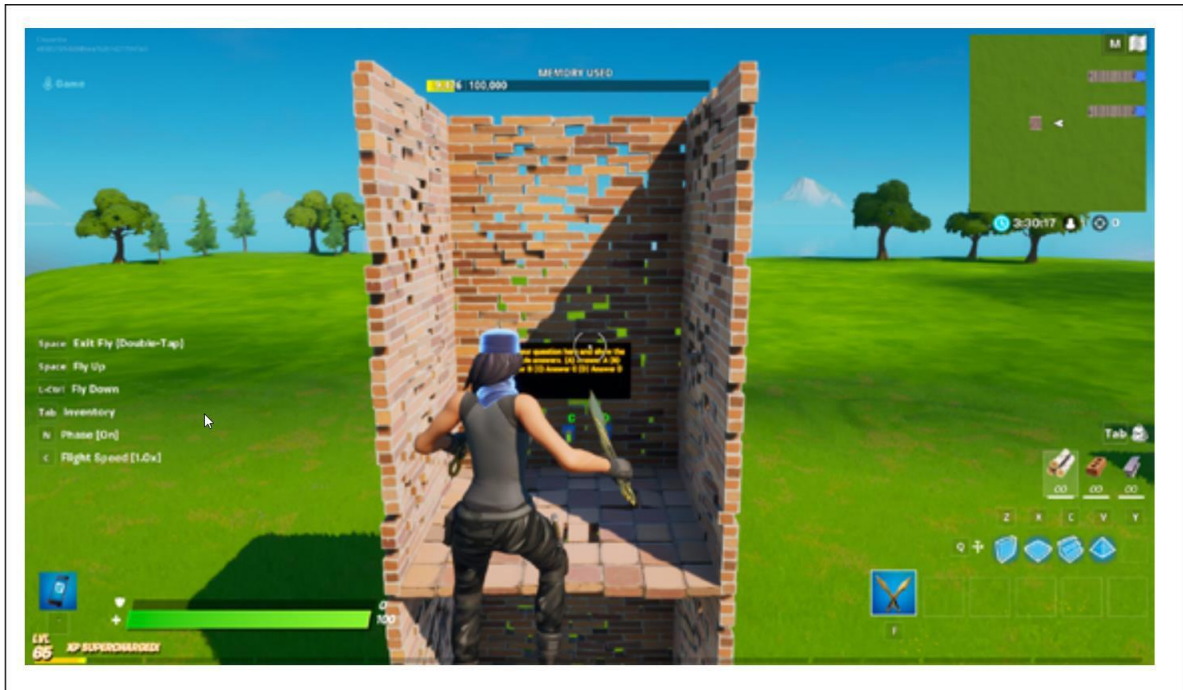
	<p>If you set Button A as the correct answer, it should run the Correct Answer function.</p> <p>Select A. Confirm that the Correct Answer function executes successfully.</p>
	<p>If you set Buttons B,C and D as the wrong answer, it should run the Wrong Answer function.</p> <p>Select B. Confirm that the Wrong Answer function executes successfully.</p>

If your tests are not successful, make sure to troubleshoot before moving on. Another great idea for troubleshooting is asking a friend. The act of explaining your problem to a new person can often reveal the solution. If you don't have someone available to listen, try explaining to a rubber duck. I know it sounds funny, but the concept still applies.

https://en.wikipedia.org/wiki/Rubber_duck_debugging

Step 5: Build the Tower with Three Questions

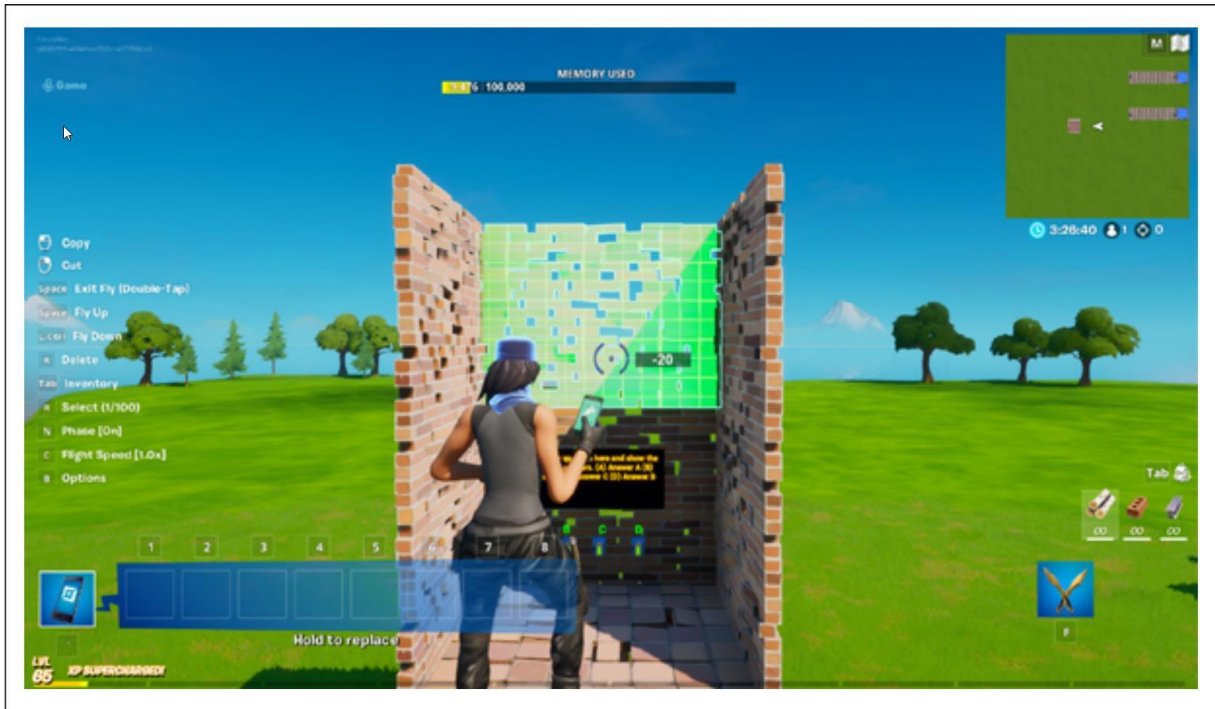
Now, reap the benefits of your clever use of functions. Copy this completed floor to create a total of three floors with three unique trivia questions. This process only requires making simple changes to the question display and setting the correct answer button. It is time to build the tower.



Use the multiple selection capability of your Phone device to select all elements in the floor, then copy and paste them upwards. (R by Default)

Equip your Phone device. When you look at an object, it will be highlighted in blue.





Selected objects turn green. To deselect, simply press the Select key again on your object. Select everything from the floor, in the middle of our build, up to the top.



Once all elements are green, including the buttons and both billboards, select the key/button for Copy (the left mouse button, by default). This copies all the objects at once. Fly upwards to place two more floors.



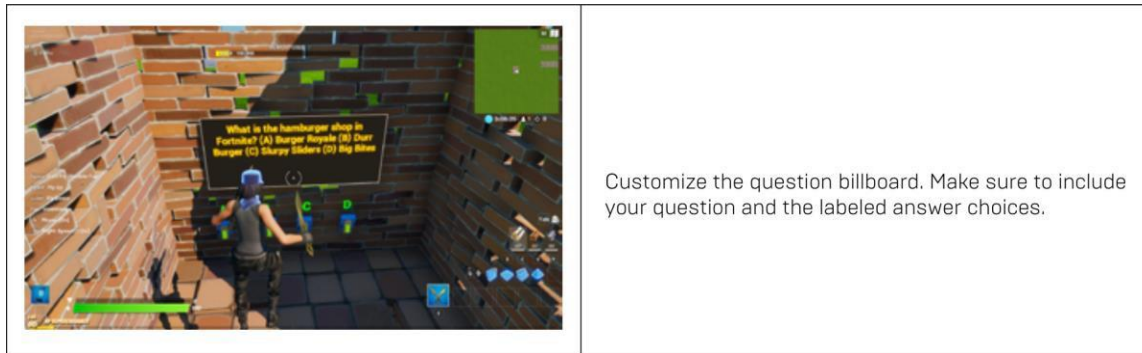
When finished with the copy-and-paste process, you should have a tower with three separate questions.



SET YOUR TRIVIA QUESTIONS AND ANSWERS

It is time for you to get smart and create your trivia questions. The first question appears on the top floor and the player will progress downward with each correct answer.

Repeat these steps for each question.



Remember to always set the Wrong Buttons to send an event to the Wrong Pulse Trigger and to set the Right Buttons to send an event to the Right Pulse Trigger.

We will skip the test on this step and test after the next step is complete.

Step 6: Move Through the Trivia Tower

The goal of the game is to escape Trivia Tower as quickly as possible. The player starts on the top floor and falls to the next floor after each correct answer. At the ground level, the player will collect a coin to stop the clock and complete the game.


OUR CHALLENGE

To get the player to move to the next question, you need to selectively remove a floor after each correct answer. We need a way to address each floor separately.

We can accomplish this with a device called a Trick Tile and some clever customizations. You can use some important customizations with the Trick Tile.

- It can be set on or off before the game starts.
- It can be turned on via an event transmission.
- It can break the tile it is attached to when receiving a signal.
- After it breaks a tile, it can transmit a signal.

Devices Needed

	<p>Trick Tile</p> <p>This can be placed on your floors and customized to break with each correct answer to progress the player through the tower.</p>
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Set Up the Trick Tiles

After you equip the Trick Tiles from the Fortnite Creative inventory, place one on each floor.



	<p>Set each Trick Tile to be OFF on player contact.</p>
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	<p>Set each Trick Tile to trigger when it receives a signal from Right Trigger 1.</p> <p>This will make all of them go off at once, so make sure you follow the next step to fix that.</p>
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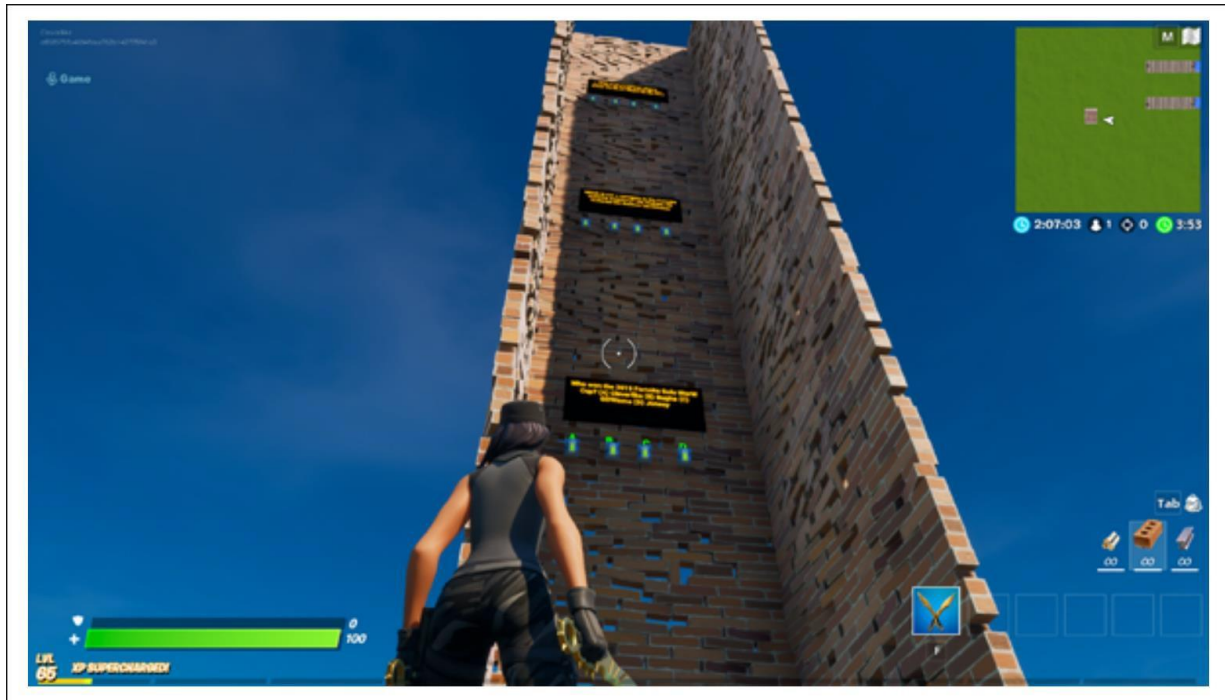
	<p>Set the rest of the Trick Tiles to be OFF at Game Start so they can't trigger until you turn them each on.</p>
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	<p>Lastly, set each Trick Tile to be enabled when the Trick Tile before it is activated.</p> <p>The Trick Tile at the top of the tower should activate the one below it.</p> <p>Then that one should activate the one below it, and so on.</p>
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Test Your Logic

That last part was tricky. You should now have all of our game mechanics in place. Test them to see if you can work through each floor from top to bottom.

If everything is working properly, all three floors will be missing by the time you make it to the bottom of the tower.



you didn't get it right on the first try, that's OK. Use your clever and confident troubleshooting skills to find out what is wrong.

When you make a fix, make sure to test to see if the gameplay up to this point is working.

Step 7: Ending the Game and Showing Player Time


The goal of the game is to escape Trivia Tower as quickly as possible. The player starts on the top floor and falls to the

Wow! We're so close to completing our Trivia Tower and leveraging functions to save time!

Collecting the Coin

We are going to use a gold coin to end the game.

Supplies Needed

	<p>Coin Device</p>
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Put the coin at the bottom of the tower.



Make sure there is a doorway at the bottom of the wall so the player gets the feeling of escaping the tower.

ADD PLAYER SPAWN AREA AT THE TOP OF THE TOWER

Since we want to start the player at the top of the tower, we'll need to place a Player Spawn at the top of the tower.

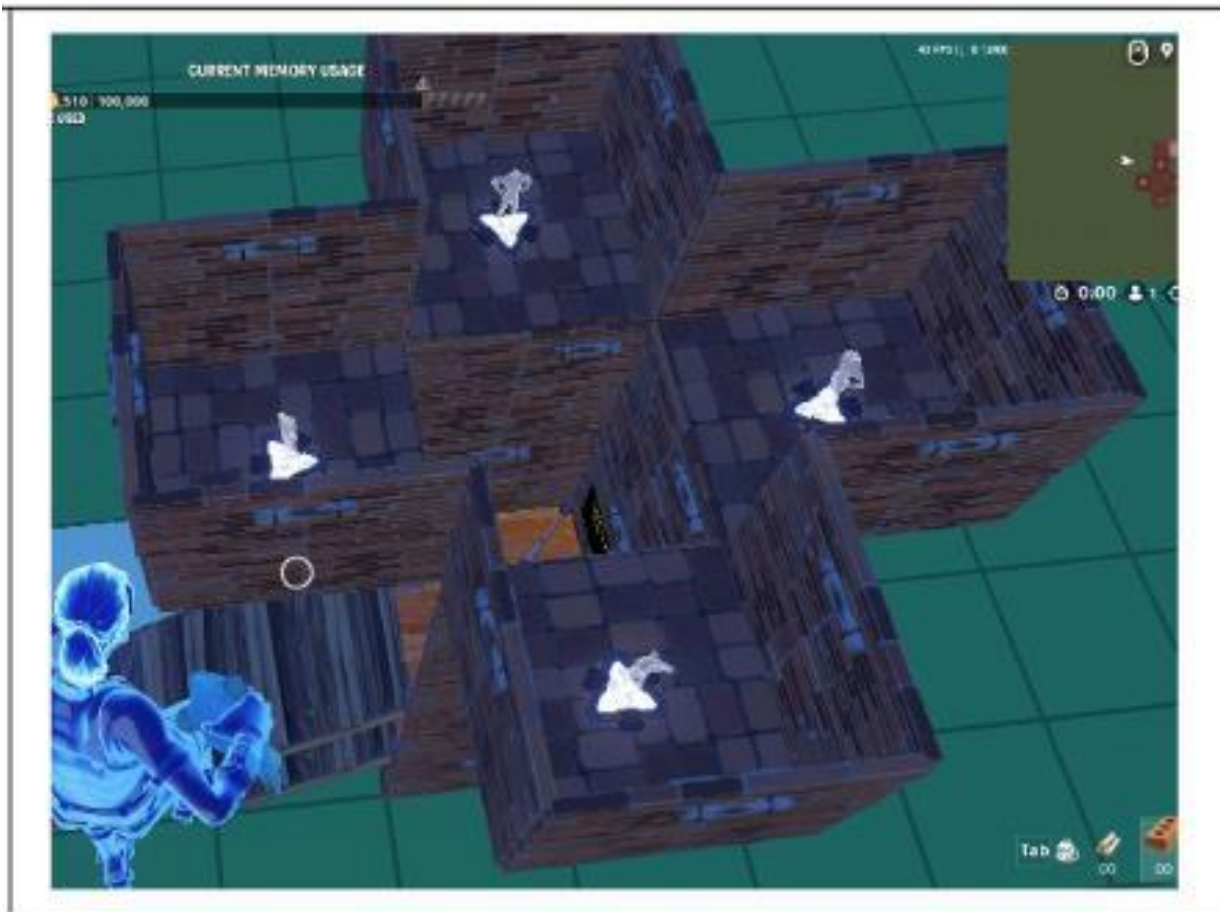
Let's build a simple extension at the top of the tower so the player can spawn and jump in to start the first trivia question.

Devices Needed

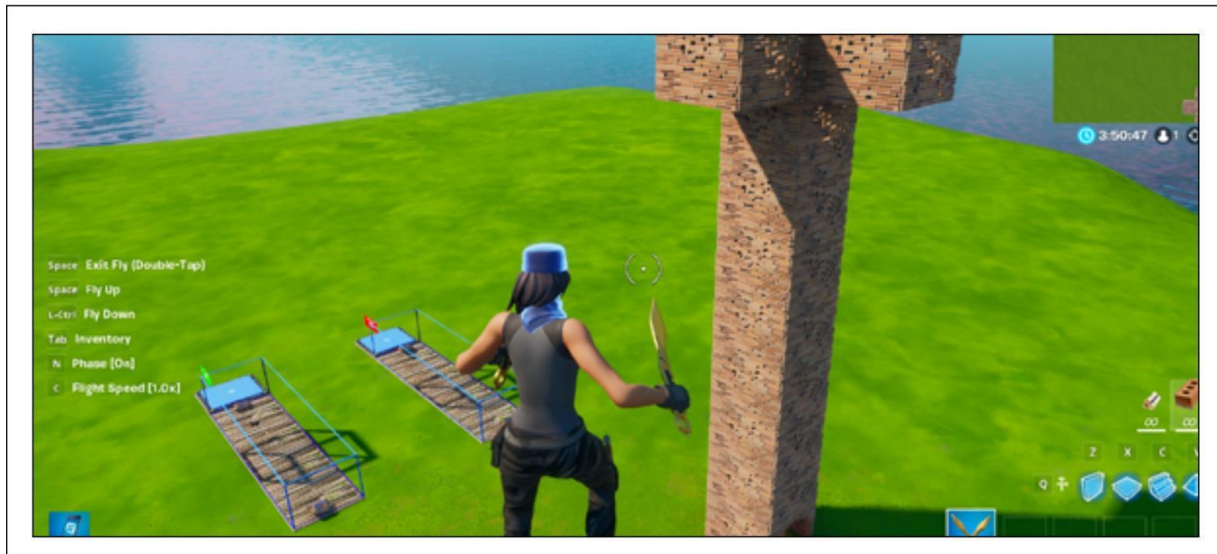


Player Spawn

Place at the top of the tower to ensure that is where the player begins the game. The only way to escape is to answer the trivia questions.



After the Player Spawn devices are in place, it is time to seal the tower.



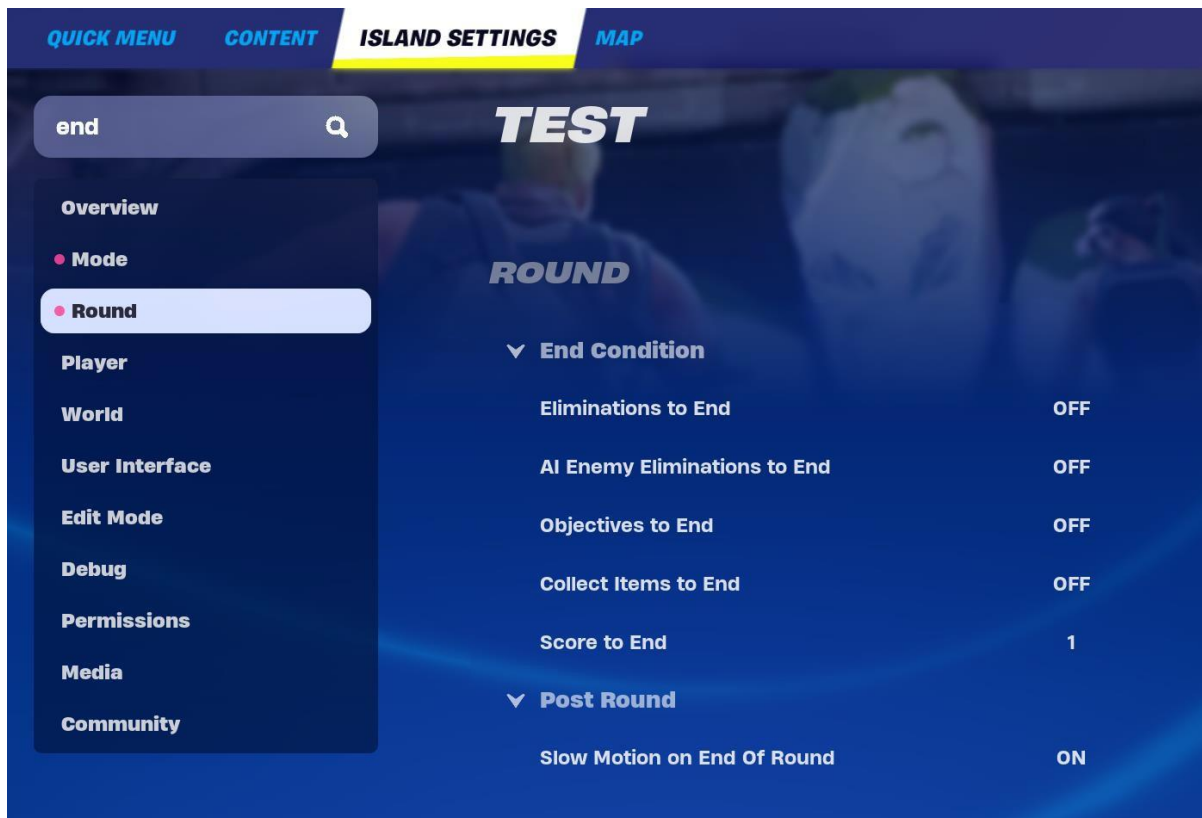
Our Trivia Tower is now complete. Just one more step!

DETECTING THE GAME END AND DISPLAYING TIME

The final step is to set your game settings to indicate that collecting a coin ends the game. When the game is over, you need to set the game to display the player's time. Once these final steps are done, the game is ready!

DETECTING THE GAME ENDING

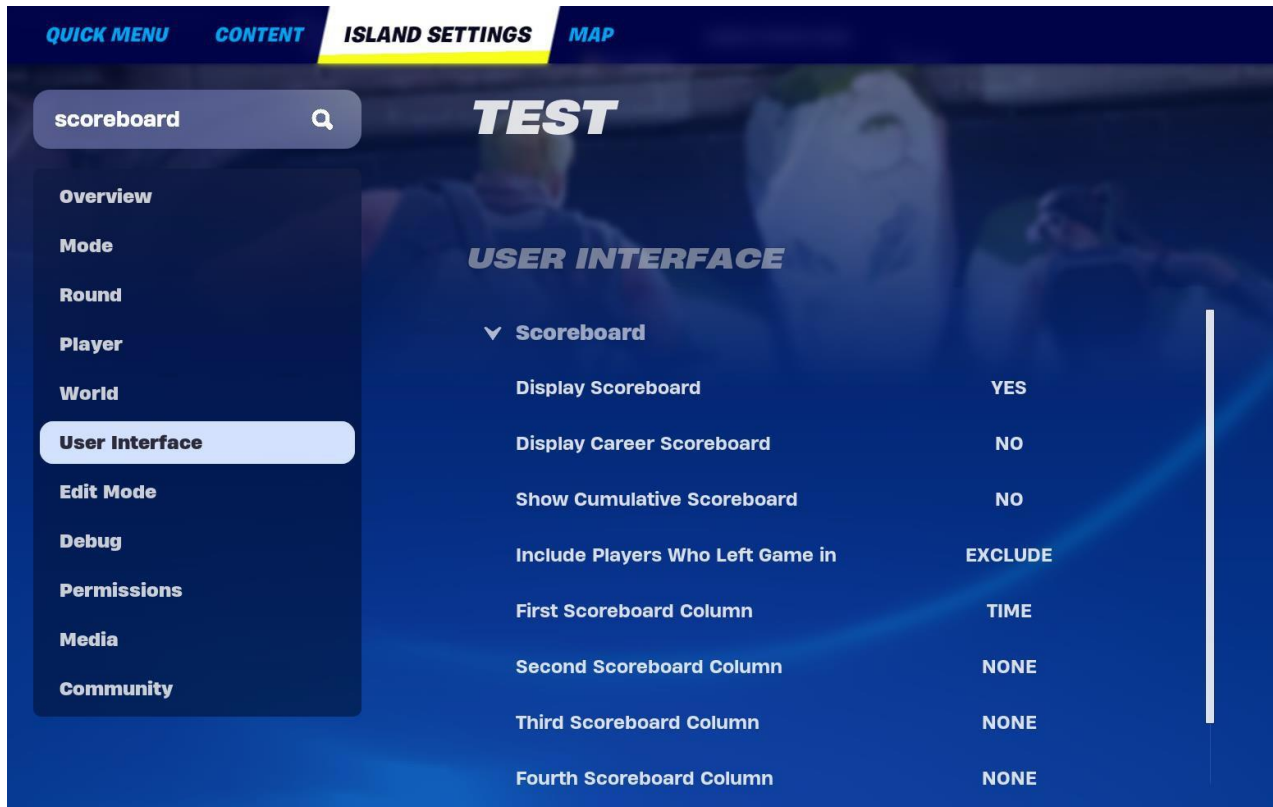
The coin that the player collects at the bottom of the tower adds one point to the player's score by default. Set the game rules to end the game when a player reaches one point.



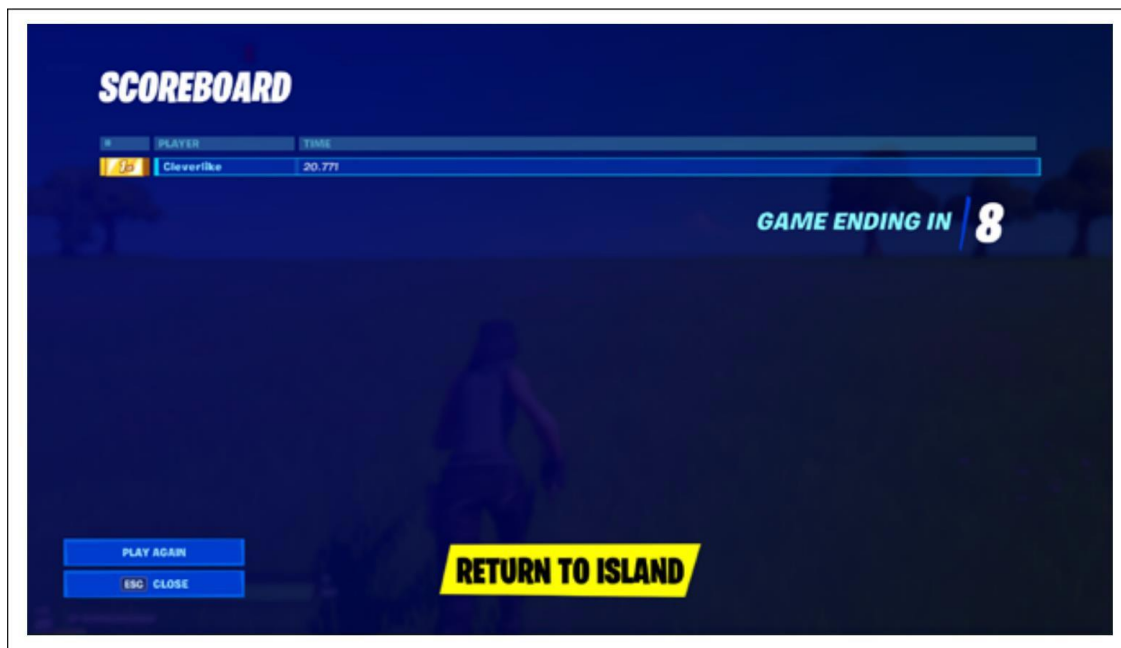
In the Inventory screen, click the Island Settings tab. On the Island Settings tab, select the Round tab. Navigate to the Score to End setting and set it to 1 so the game will end when the coin is collected.

DISPLAYING THE TIME

Since this is a timed challenge, you need to make sure the player time is displayed when the game is completed.



In the Inventory screen, click on the Island Settings tab. Select the User Interface tab on that screen. Set the First Scoreboard Column setting to Time so the player time appears on the scoreboard when the game ends.



Hit that Start Game button and give it a try! Challenge your friends to see who gets the fastest time.

Extension Activities

- If you would like to improve the aesthetics of the tower, you can use elements from Prefabs and Galleries to build a more elaborate tower.
- Add more than three levels to your tower.
- Try some different types of questions, like True or False.
- Add lights to show when answers are right and wrong.
- Add a new function that improves the game.
- Create a choice-based adventure game that advances the player based on their responses.

FORTNITE

FUNCTIONS IN FORTNITE: CREATING A TOWER ESCAPE TRIVIA GAME

STUDENT GUIDE