

# Scratch Basketball Game Instructions

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## Overview



This document will walk you through creating our [Scratch basketball game](https://scratch.mit.edu/projects/870321000) step by step from a blank project. You can click on the hyperlink above or copy and paste the following link in your browser to play the game we are going to create and view the code: <https://scratch.mit.edu/projects/870321000/editor/>



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## Instructions

### Part 1: Select your Sprites and Create your Background

Steps:

1. Select *the Basketball 2* backdrop from the backdrops
2. Click the Choose a Sprite button and Select the basketball and laptop Sprites
3. Click on the backdrop image in the Stage bar on the right of your screen above the Choose a Backdrop image. Then click on the Backdrops tab in the left menu.
4. Change the Fill color to red and paint the bottom of the basketball court using a filled rectangle

### Part 2: Program the Basketball Movement

Steps:

1. Click on the Basketball in the Sprite menu. Now that the basketball is highlighted all of the code you apply will be assigned to the Basketball Sprite. Next, click on the code tab to begin programming the basketball.
2. Click on the **Events** tab and drag the *When Clicked* code block to the middle column, which is called the Scripts Area.
3. Click on the **Motion** tab, and drag the *go to x & y* and the *point in direction* code blocks to the Scripts area and attach it to the *when clicked* code block
4. Set the x axis to -10, the y axis to 117, and the direction to 45 degrees.
5. Click on the **Control** tab and drag the *forever* code block to the Scripts Area and attach it to the bottom of your *point in direction* code block. Then Click on the



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**Motion** tab and drag the *if on edge bounce* and *move 10 steps* code block inside of your *forever* code block.

6. Now it's time to create our first variable. This variable will allow our basketballs movement to change based on certain conditions, rather than being set to 10 steps for the entire duration of the game.

Click on the **Variables** tab, then click on make a variable. Set the variable name to `num_of_steps` and make it only for the basketball sprite.

7. Drag your *num\_of\_steps* variable to the move 10 steps code block, so that the number 10 is replaced with your *num\_of\_steps* variable. Your code should now look like the image below.

## Part 3: Create a Score Variable

This variable will allow you to keep track of the players score throughout the game.

Steps:

1. Click on the **Variables** tab; then click on make a variable. Set the variable name to *score* and make it only for the basketball sprite.

## Part 4: Program the Basketball Game Play

This next block of code will contain most of the game logic. Here is where we will set the ball speed, set the score and determine how it's calculated, and create levels, which will modify the ball speed accordingly. Note: the basketball sprite should still be highlighted.

Steps:

1. Click the **Events** tab and drag the *when clicked* code block to the Scripts Area.



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2. Click on the **Variables** tab; then drag the *set my variable to* code block to the Scripts Area and connect it to the when clicked code block you just added.
3. Click on the *my variable* dropdown in the *set my variable to* code block you just added, and change the variable to *num of steps*; then set the amount to 10
4. Drag another *set my variable to* code block to the Scripts Area and connect it to the block you just added. Then click on the *my variable* dropdown in the *set my variable to* code block; this time change the variable to *score*.
5. The next few blocks of code will continue throughout the duration of the game, so we're going to wrap them in a *forever* block. Click on the **Control** tab and drag the *forever* code block to the Scripts Area and attach it to the bottom of your *set score to* code block.
6. Then drag the *if then* code block inside of the *forever* block.
7. The first condition we're going to set is what happens when the ball touches the Laptop Sprite. So, click the **Sensing** tab and drag the *touching mouse pointer* code block in-between the if and then words.
8. Click the *mouse pointer* dropdown and select Laptop.
9. Click on the **Variables** tab; then drag the *change my variable by* code block inside of the *if block* and change the variable to *score*.
10. Click on the **Sound** tab; then drag the *start sound* code block underneath the *change score* code block in the if statement. Click the dropdown menu and change the sound to pop.
11. Click on the **Motion** tab and drag the *turn 15 degrees* code block underneath the *start sound* code block. Change the degrees to 180
12. Click on the **Control** tab and drag the *wait 1 second* code block under the *turn 180 degrees right* code block.
13. Now we are going to create multiple levels. Click on the **Control** tab and drag an *if then else* code block inside of your current *if then* code block under the *wait 1 second* code block.
14. This next level will be determined on the *score* and *number of steps* values. To examine two conditions, we will need to



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add an *and* operator. Click on the **Operators** tab and drag the and operator (  ), in-between the if and then on the code block you just added.

15. Drag the not operator (  ) into the hexagon on the right.
  
16. Drag one greater than operator (  ) into the left hexagon, and one greater than operator into the *not* operator in the right hexagon.
17. Click on the **Variables** tab; then drag the *score variable* inside of the first *greater than* code block and set the value to 10.
18. Next, drag the *num of steps* variable into the second greater than sign and set the value to 15.
19. Click the **Events** tab and drag the *broadcast message1* code block into the first empty line in the if else code block.
20. Click on message1 inside the broadcast code block, then click new message and change the name to Level 2.
21. Click on the **Control** tab and drag an *if then* code block inside of the else block.
22. Repeat steps 14-16 in this section.
23. Click on the **Variables** tab; then drag the *score variable* inside of the first *greater than* code block and set the value to 25.
24. Next, drag the *num of steps* variable into the second greater than sign and set the value to 15.
25. Click the **Events** tab and drag the *broadcast message1* code block into the empty line in the if then code block, then click new message and change the name to Level 3.



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### Part 5: Add a Basketball Scoring Component (optional)

This next block of code will add additional points and a sound whenever the player gets the ball within a certain range of the basket.

**Note:** the basketball sprite should still be selected.

Steps:

1. Click the **Events** tab and drag the *when clicked* code block to the Scripts Area.
2. Click on the **Control** tab and drag a *forever* code block underneath the *when clicked* code block you just added.
3. Drag an *if then* code block inside of the *forever* code block.
4. Click on the **Operators** tab and drag the and operator (  ), in-between the if and then on the code block you just added.
5. Drag another and operator on the left and right side of the and operator you just added.
6. Drag the *less than* operator into the first empty hexagon and the *greater than* operator into the second hexagon.
7. Drag the *less than* operator into the third hexagon and the *greater than* operator into the last hexagon.
8. Click on the **Motion** tab, scroll to the bottom of the section, and drag the *x position* code block inside of the first *less than* operator block. Change the value on the right of your *x position* to -60.
9. Drag another *x position* code block inside of the first *greater than* operator block. Change the value on the right of your *x position* to -110.
10. Drag a *y position* code block inside of the first *less than* operator block on the right and change the value to 115.



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11. Drag another *y position* code block inside of the last *greater than* operator block on the right and change the value to 60.
12. Click on the **Sound** tab; then drag the *start sound* code block inside of the empty space in the *if then* block
13. Click on the Sounds tab on the top right of the side menu
14. Click on the add new sound button at the bottom of the left side menu
15. In the search bar search *gong* then select it from the menu. Gong should now appear in your side panel.
  
16. Navigate back to the code menu. Then click the dropdown menu in the *start sound* code block you added and change the sound to Gong
17. Click on the **Variables** tab; then drag the *change my variable by* block inside the *if then* block, under the start sound code block.
18. Change the variable to score and the increase by value to 2. This will increase the score by 2 points whenever the player gets the ball near the basket.
19. Click on the **Control** tab and drag the *wait 1 second* code block underneath the *change score by* code block you just added.

### Part 6: Determine the Game Ending

This next block of code will let the computer know you want the game to end when the ball touches the red area on your court

**Note:** the basketball sprite should still be selected.

Steps:



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1. Click the **Events** tab and drag the *when clicked* code block to the Scripts Area.
2. Click on the **Control** tab and drag a *forever* code block underneath the *when clicked* code block you just added.
3. Drag an *if then* code block inside of the *forever* code block.
4. Click the **Sensing** tab and drag the *touching color* code block in-between the *if* and *then* words; then click on the color. The pop-up menu will allow you to choose your color. We want the color to be the same as the color you added to your background, so we're going to use the pointer.
5. Click on the pointer; then click on the red in your background. The color in your *touching color* code block should now match the red color in your background.
6. Click the **Looks** tab and drag the *say* code block into the *if then* code block
7. Click the current message in the *say* code block and replace it with "Game Over!"
8. Click on the **Control** tab and drag the *stop all* code block underneath the *say game over* code block you just added. We are now done programming our basketball. You should have four separate blocks of code.

## Part 7: Program the Laptop

The last thing we need to do is program our Laptop sprite to hit the basketball. It will only move across the x-axis. The y-axis will remain at location  $y = -155$  so that the paddle can't move up and down

Steps:

1. Click on the Laptop sprite in the sprite menu on the right under the stage. Your coding area should now be cleared.
2. Click the **Events** tab and drag the *when clicked* code block to the Scripts Area.
3. Click on the **Control** tab and drag a *forever* code block underneath the *when clicked* code block you just added.



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4. Click on the **Motion** tab and drag the *go to x: and y:* code block inside of the forever code block
5. Click the **Sensing** tab and drag the *mouse x* code block inside the x value; then change y value to -155.

**Our Scratch Basketball Game is now complete, use your creativity to make it your own!**

