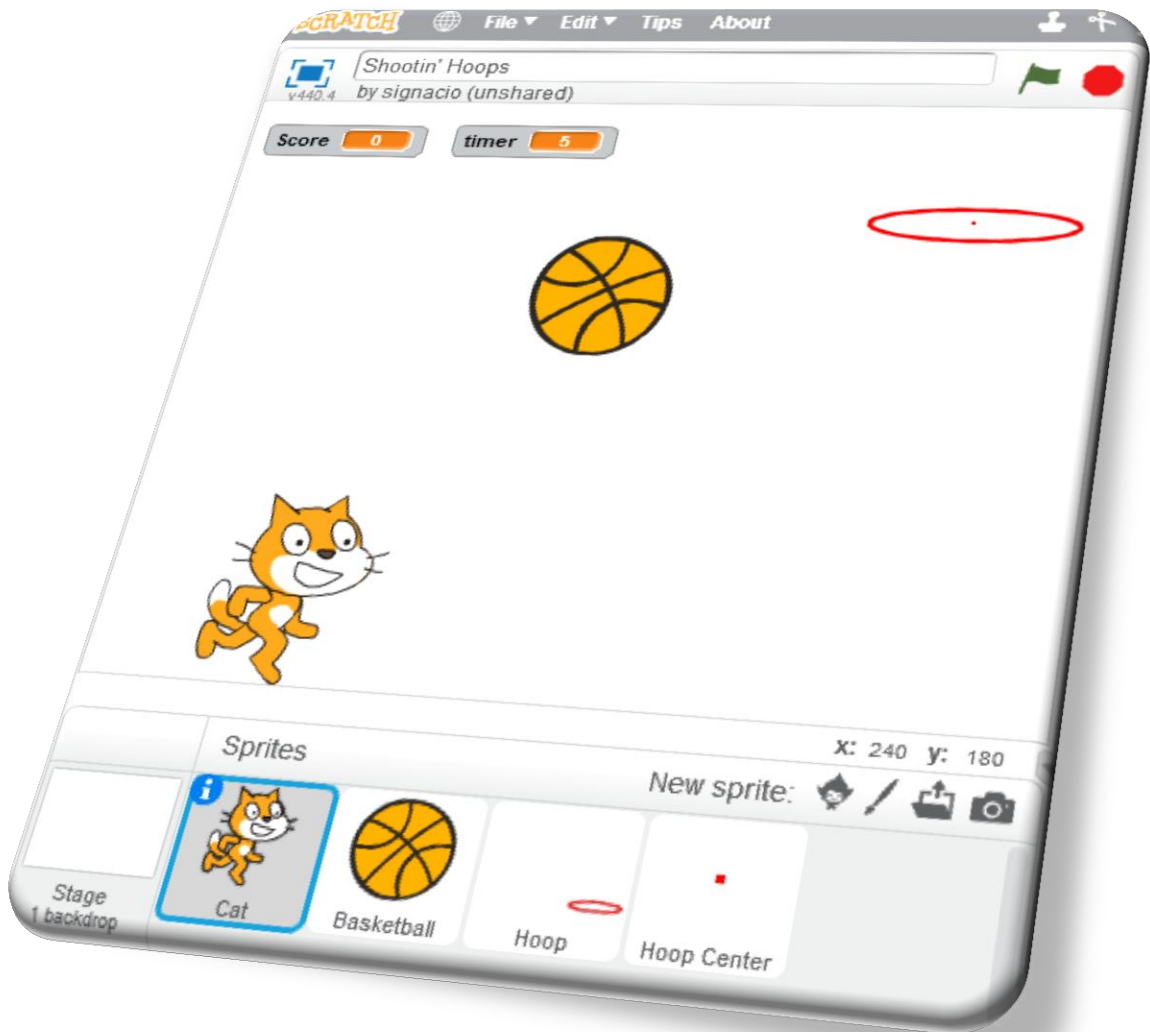


# Shootin' Hoops

## A Fun SCRATCH Coding Project for Kids

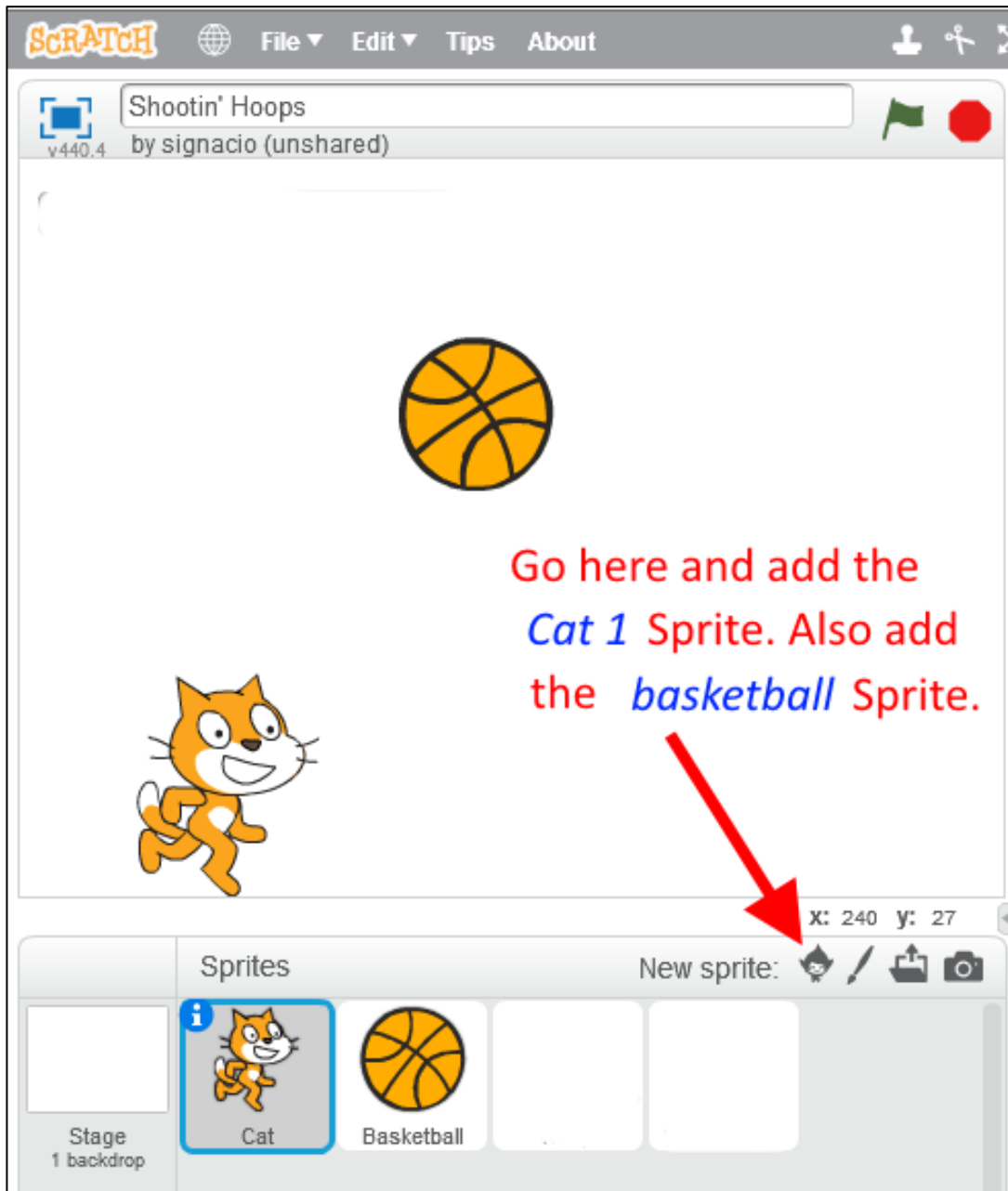


Tutorial by: [oakdome.com](https://oakdome.com) Coding by: [Invent with Programming](https://inventwithprogramming.com)

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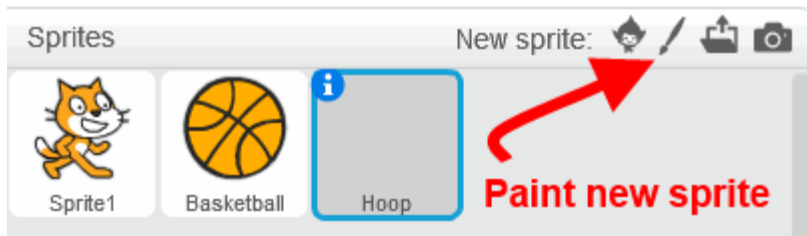
# ADD THE SPRITES

Open Scratch and add the *Cat 1* sprite and the *basketball* sprite.

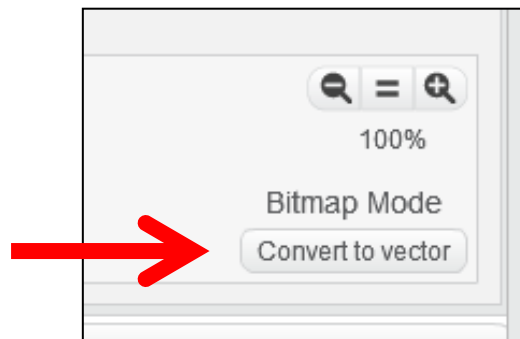


# DRAW THE HOOP

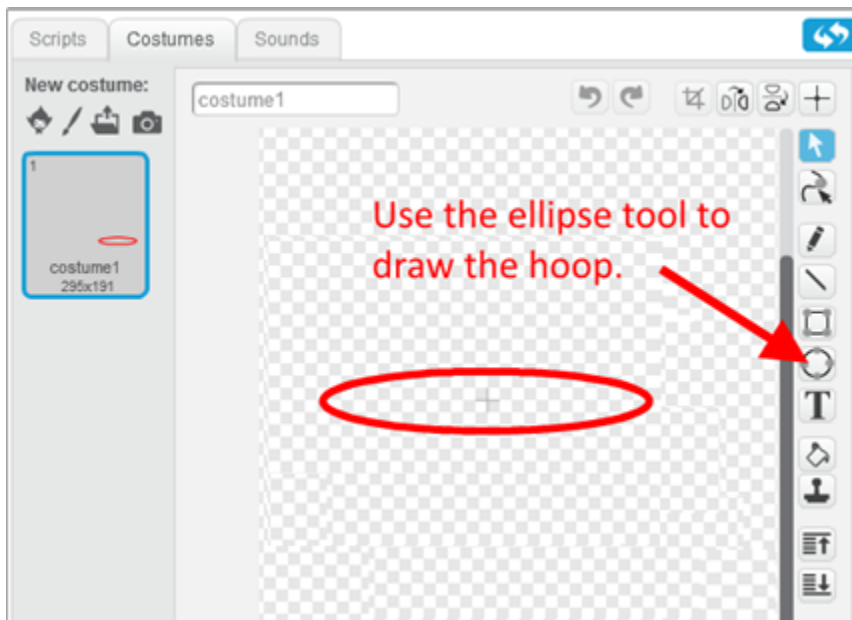
1) First, find and click the “Paint new sprite” icon.



2) Next, find and click the “Convert to Vector” button.



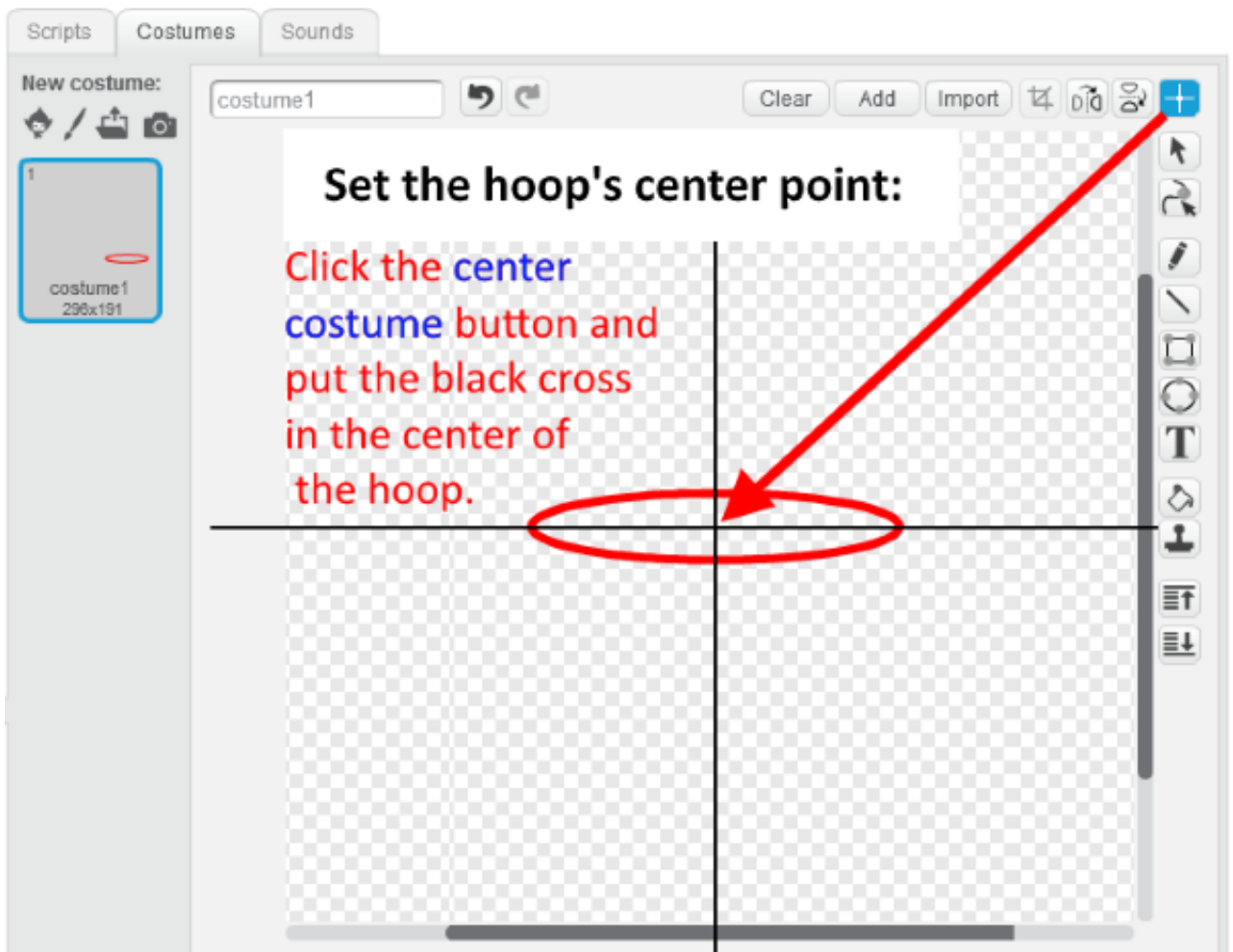
3) Now, draw the hoop.



# SET THE HOOP'S CENTER

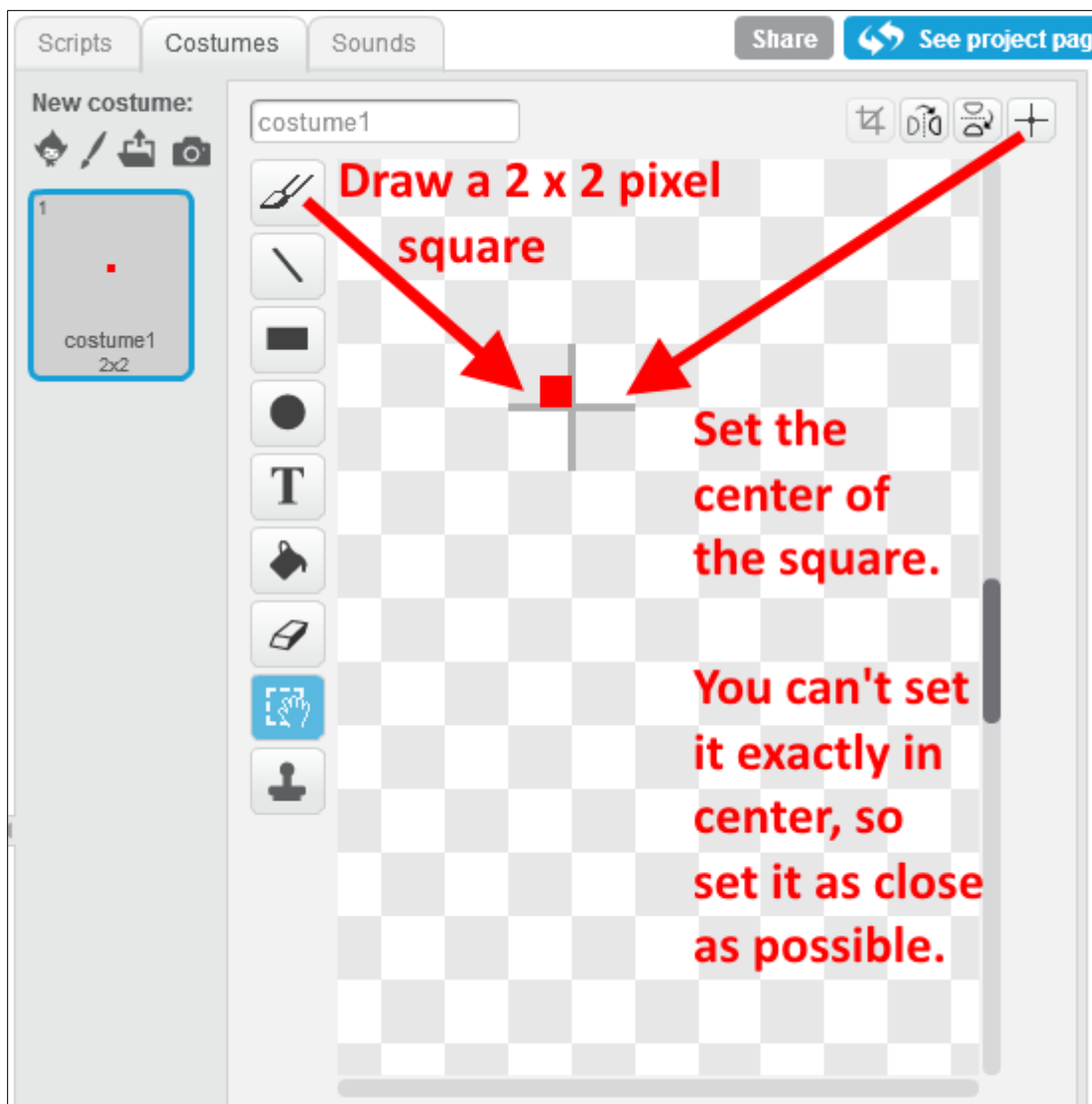
We need to tell the program where the center point of the hoop will be.

**Follow the instructions below:**



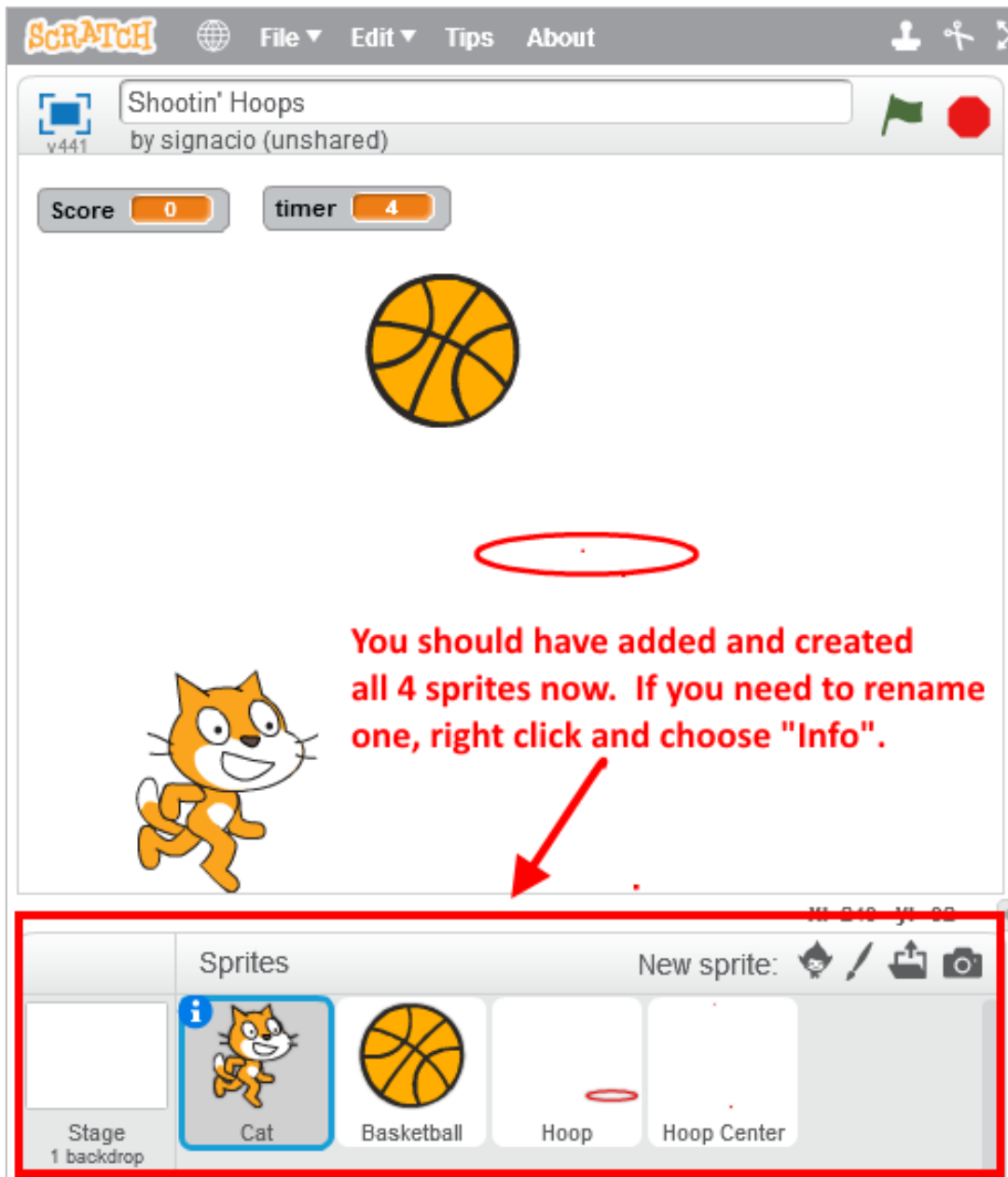
# DRAW A HOOP CENTER

We have to draw a little object that we will code to go to and stick to the exact center of the hoop we drew before. When the ball touches this little object in the center of the hoop, we will score 1 point. First draw the square, then set the center point of the square.



# CHECK YOUR WORK:

Review your work. You should have *added* the cat and basketball sprites. You should have *created* the Hoop and Hoop Center Sprites. You should have 4 sprites in total.



# MAKE A VARIABLE:

## Create the variable: “**cat falling speed**”

**Variables** are used to store information for use in programs.

This variable is used to program the cat’s rising and falling speed.

**First:** Select the *Scripts tab*, then create the variable by following the 3 steps below.

Follow these three steps to create the variable.

1. Select the **Data** category in the Scripts tab.
2. Click the **Make a Variable** button.
3. In the **New Variable** dialog box, enter the variable name **cat falling speed** and select **For all sprites**.

# MAKE A VARIABLE:

## Create the variable: “Score”

This variable will keep score when we make a basket.

**First:** Select the *Scripts tab*, then create the variable by following the 3 steps below.

The image shows the Scratch interface with the **Scripts** tab selected. The **Data** category is highlighted, and the **Make a Variable** button is visible. A red arrow labeled **1.** points to the **Make a Variable** button. A red arrow labeled **2.** points to the **Score** variable in the list. A red arrow labeled **3.** points to the **Score** variable name in the **New Variable** dialog box. A text box in the upper right of the dialog area says: **Follow these three steps to create a variable.**



# MAKE A VARIABLE:

**Create the variable: “basketball falling speed”**

This is used to program the basketball rising and falling speed.

**First:** Select the *Scripts tab*, then create the variable by following the 3 steps below.

The image shows a screenshot of the Scratch interface with three numbered steps and red arrows indicating the process of creating a variable:

- 1.** An arrow points to the **Data** category in the Scripts panel.
- 2.** An arrow points to the **Make a Variable** button.
- 3.** An arrow points to the **New Variable** dialog box, which has the variable name **basketball falling speed** entered and the **For all sprites** radio button selected.

Text overlay: **Follow these three steps to create a variable.**

# MAKE A VARIABLE:

## Create the variable: “**Made basket**”

This is used to make sure the score can only change once per throw.

**First:** Select the *Scripts tab*, then create the variable by following the 3 steps below.

The image shows the Scratch 'Scripts' tab interface. On the left, the 'Data' category is selected, and the 'Make a Variable' button is highlighted. Below it, a list of variables is shown: 'Made basket' (unchecked), 'Score' (checked), 'basketball falling speed' (unchecked), and 'cat falling speed' (unchecked). Below the list are four variable manipulation blocks: 'set Made basket to 0', 'change Made basket by 1', 'show variable Made basket', and 'hide variable Made basket'. On the right, a 'New Variable' dialog box is open, with 'Variable name: Made basket' and the 'For all sprites' radio button selected. Red arrows and numbers 1, 2, and 3 indicate the steps: 1. Click 'Make a Variable', 2. Click 'Made basket', and 3. Click 'OK' in the 'New Variable' dialog. A text box on the right says 'Follow these three steps to create a variable.'

# CAT CODE

Program the cat by adding the code below. Can you read the code and figure out what it does? Test your code.

```
when clicked
  forever
    if key left arrow pressed? then
      next costume
      change x by -10
    if key right arrow pressed? then
      next costume
      change x by 10
    if y position < -124 then
      set y to -125
      set cat falling speed to 0
    else
      change cat falling speed by -2
    change y by cat falling speed

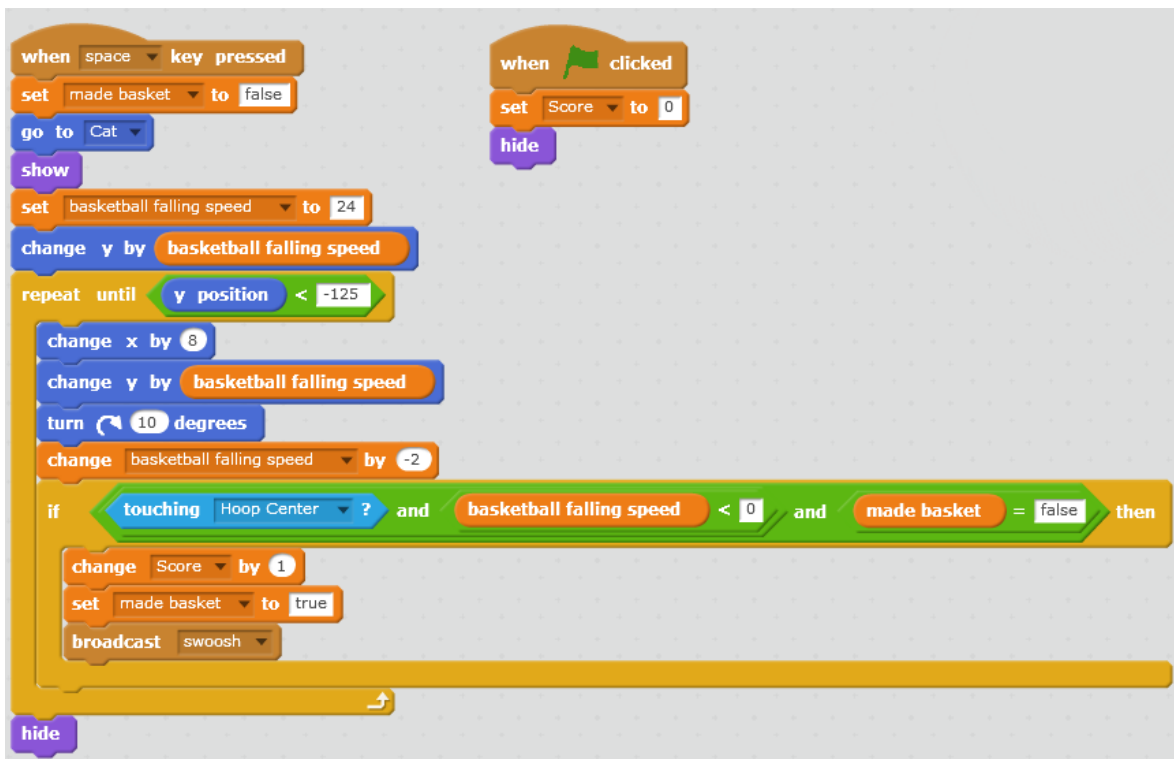
when up arrow key pressed
  if y position = -125 then
    set cat falling speed to 20
    change y by cat falling speed
```

The image shows two Scratch code blocks. The first block is a 'when clicked' event that starts a 'forever' loop. Inside the loop, there are three 'if' statements: one for the left arrow key (moves x left, next costume), one for the right arrow key (moves x right, next costume), and one for the y position (if below -124, sets y to -125 and falling speed to 0; otherwise, increases falling speed by 2). A 'change y by cat falling speed' block is at the bottom of the loop. The second block is a 'when up arrow key pressed' event with an 'if y position = -125 then' condition, which sets 'cat falling speed' to 20 and then 'change y by cat falling speed'.

# BASKETBALL CODE

Program the basketball using the code below. Can you read the code and figure out what it does? Test your code.

**Tip:** Go to the next page to see a larger version of this code.



```
when space key pressed
  set made basket to false
  go to Cat
  show
  set basketball falling speed to 24
  change y by basketball falling speed
  repeat until y position < -125
    change x by 8
    change y by basketball falling speed
    turn 10 degrees
    change basketball falling speed by -2
  if touching Hoop Center ? and basketball falling speed < 0 and made basket = false then
    change Score by 1
    set made basket to true
    broadcast swoosh
  hide

when clicked
  set Score to 0
  hide
```

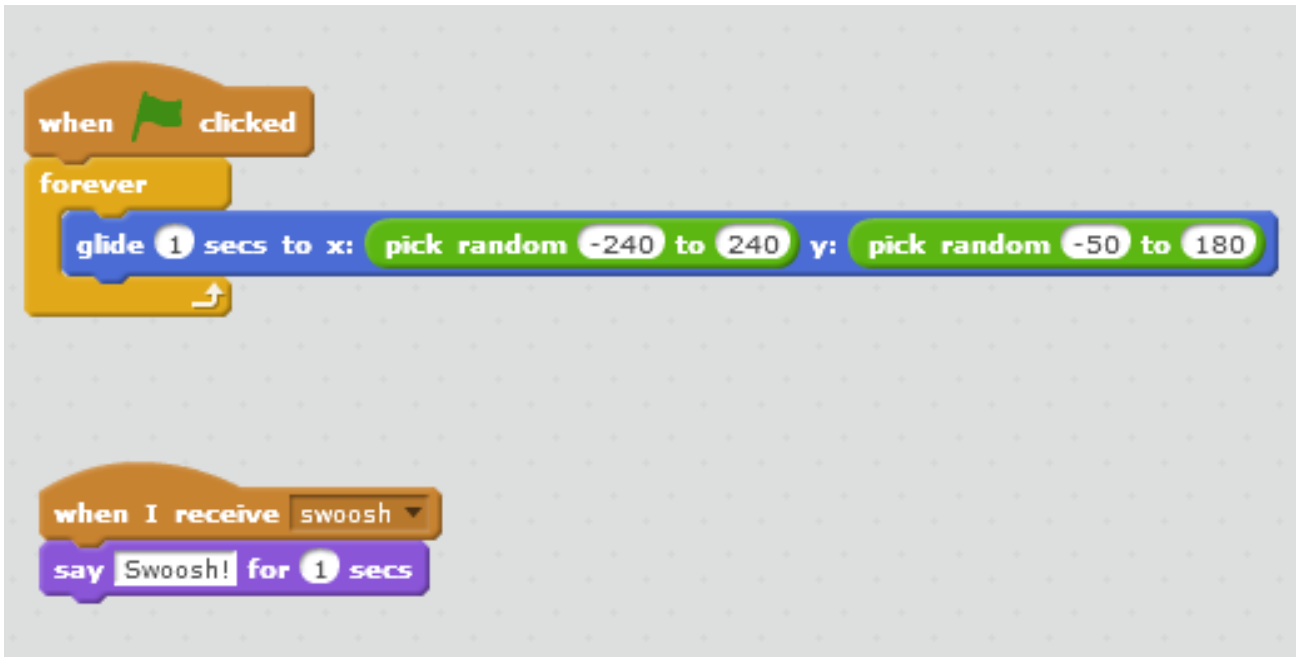
# Basketball Code

The image shows a Scratch script for a basketball game. The script is organized into several sections:

- Initial State:** A **when space key pressed** block sets **made basket** to **false**, followed by a **go to Cat** block and a **show** block.
- Game Loop:** A **repeat until** block with **Y position < -125** contains:
  - change x by 8**
  - change Y by basketball falling speed**
  - turn 10 degrees**
  - change basketball falling speed by -2**
- Collision and Scoring:** An **if** block with conditions **touching Hoop Center ?** and **basketball falling speed < 0** and **made basket = false** then:
  - change Score by 1**
  - set made basket to true**
  - broadcast swoosh**
- Reset:** A **when clicked** block sets **Score** to **0** and a **hide** block.

# HOOP CODE

Program the basketball hoop using the code below. Can you read the code and figure out what it does? Test your code.



# HOOP CENTER CODE

Program the hoop center using this code.

What does this short piece of code do to the hoop center?



# CODE CHALLENGE:

Games are more fun and challenging when there is a time limit.

Your challenge is to create a game timer that counts down from 30 seconds when the game is started and stops the game when the timer runs out.



The object is to see how many baskets you can score before the timer gets to zero and the game stops.

My best score is 7 points in 30 seconds. Can you beat that?

## Hint:

Search Scratch for “**how to make a timer**”

# Final Notes

This Shootin' Hoops

Scratch tutorial is by [oakdome.com](http://oakdome.com)

All coding was done by Al Sweigart. Visit his [Teachers Pay Teachers](#) store for his excellent step-by-step video tutorial for this project. He clearly and simply explains what each piece of the code does as he builds the game. It is very educational and I highly recommend it for coding teachers and students alike.

He has many other excellent Scratch videos at his store. Most are free. Take a [quick look](#):

Steve Lee

[oakdome.com](http://oakdome.com)