

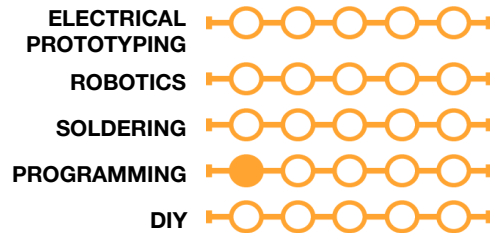
# PicoBoard / Scratch Reaction Timer

Using a few of the features in Scratch and the PicoBoard, we are going to create a fun Reaction Timer Game. What is your best reaction time? How does it change if you use sound?

Challenge your friends to see who has the fastest reaction time!



**SCRATCH**  
SKILL REQUIREMENTS  
DIFFICULTY 1-5



## MATERIALS LIST

- Computer
- Scratch
- PicoBoard

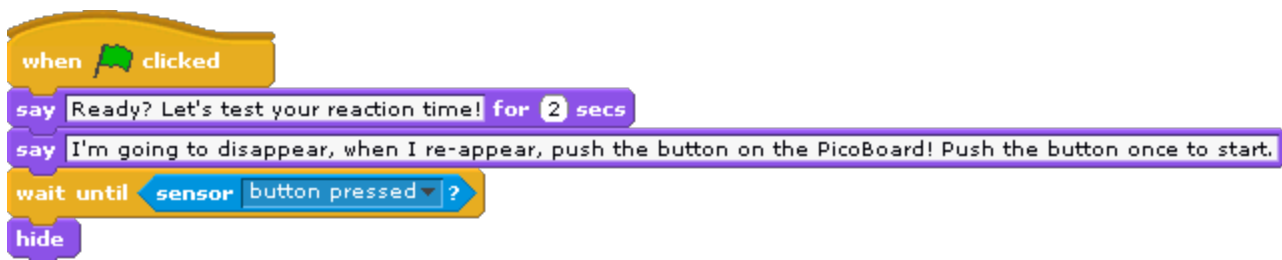
## STEP 1: Understanding the Reaction Timer

Before we start doing any programming, let's first lay out how the code *should* work. We sometimes call this writing "pseudo-code."

1. We want the game to start when a button is pressed. Once the button is pressed, the cat will dis-appear and the game will wait a random number of seconds (between 1 - 5 seconds).
2. After this random wait time, the cat will re-appear, and you must hit the button as quickly as possible.
3. The time between when the cat appears and when you push the button will be displayed on the screen.

## STEP 2: Let's break this down into chunks.

1. Introduce the game and wait for the button press to start. Notice, right after the wait until block, we hide the sprite.



2. Wait a random number of seconds between 1 and 5, reset the **Timer** variable, and show the Sprite. Note, I added a quick "Go!" statement as well.

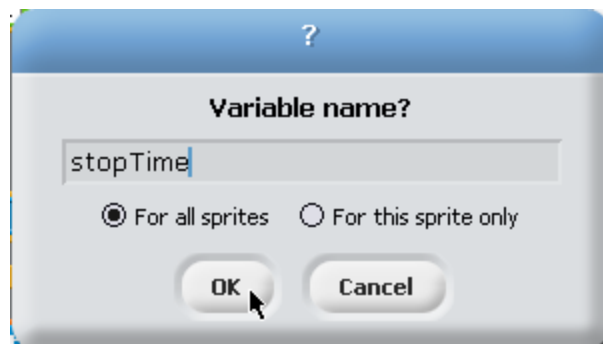


3. Now, here it's a bit tricky. We need to use a **forever if** loop that will continue to loop and check for a button press. If the button is pressed, it will run the code inside the if block.



When we push the button, we want to capture the timer value and display it. For this, we will use a **variable**. Variables are substitutes for a value or a number. It like a place that we can use to save a number. Because this variable will be used to store the stop time, let's call it **stopTime**. Scratch does not care if you use spaces, but in most programming languages, spaces and special characters are not allowed. It's good to get in the habit of taking spaces out.

Click on variables, Make a variable:



Name it **stopTime**: →

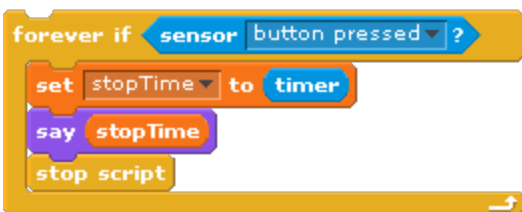
Now, add the **set (stopTime) to ( )** block and the **timer** block.



And, finally the last two blocks:



This part should look like:



### STEP 3: Test the code.

String it together all of the blocks and play. How fast are you? The average for an adult is about 0.21 seconds, Are you faster?

### What if you don't have a PicoBoard??

That's okay. Instead of using the <sensor button pressed> block, there are two other blocks that have the same shape. There is a <mouse down?> block and a keyboard <key [ ] pressed?> block. Notice that the shape of this block is a little different? This shape indicates that it is a **boolean** value - and it can only have one of two values - either **YES** or **NO**.

A blue Scratch block with a question mark, labeled "mouse down?".A blue Scratch block with a question mark, labeled "key" followed by a dropdown menu showing "space" and "pressed?".

#### TAKING IT FURTHER

- Can you add this code to the background? Make the background change color or picture?