# Against the Clock

## Introduction

SAMPLE

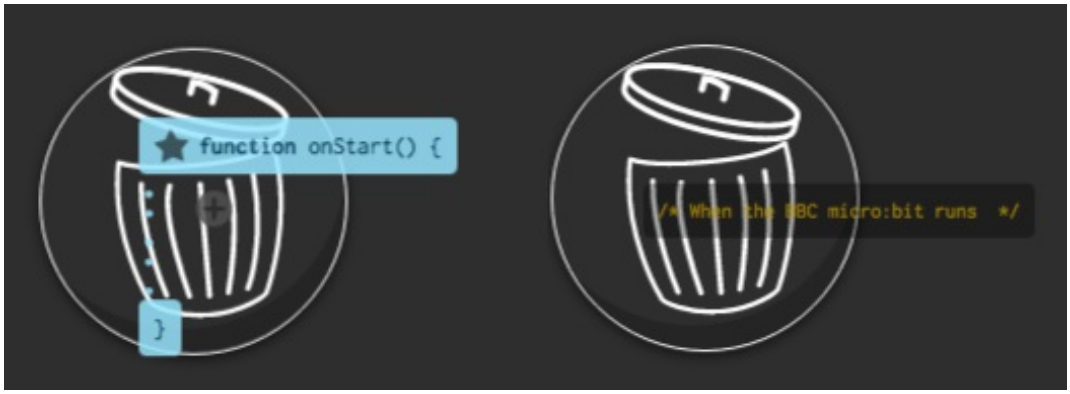
You are going to learn how to make a timer, so that you can use it to challenge your friends!

## Step 1: Setting up your timer

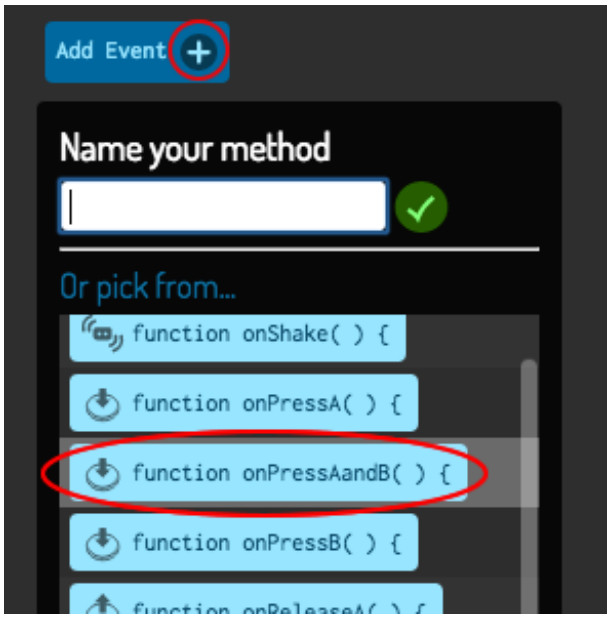
Let's set your timer to 0 when buttons A and B are pressed together.

### Activity Checklist

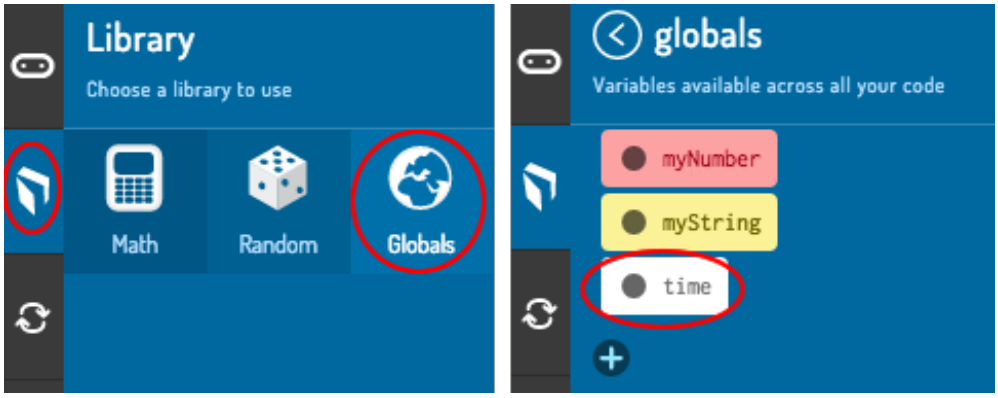
- [ ] Go to **jumpto.cc/mb-new** to start a new project in the Code Kingdoms editor. Call your new project 'Timer'.
- [ ] Drag the `onStart` event (including the comment) into the bin, as you don't need it.



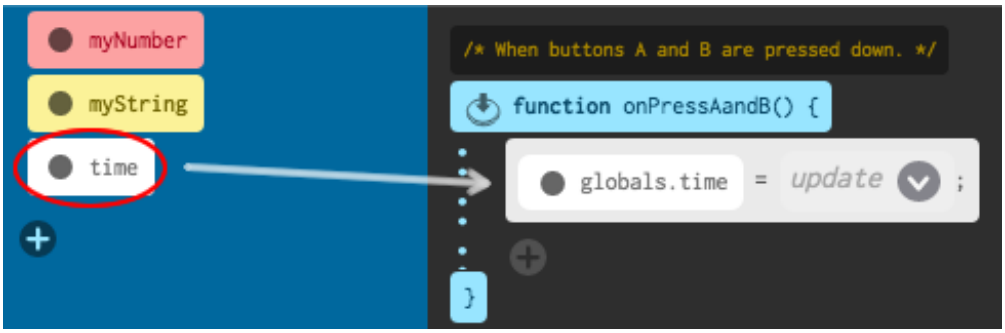

- [ ] Click 'Add Event' and create a new `onPressAandB` event.



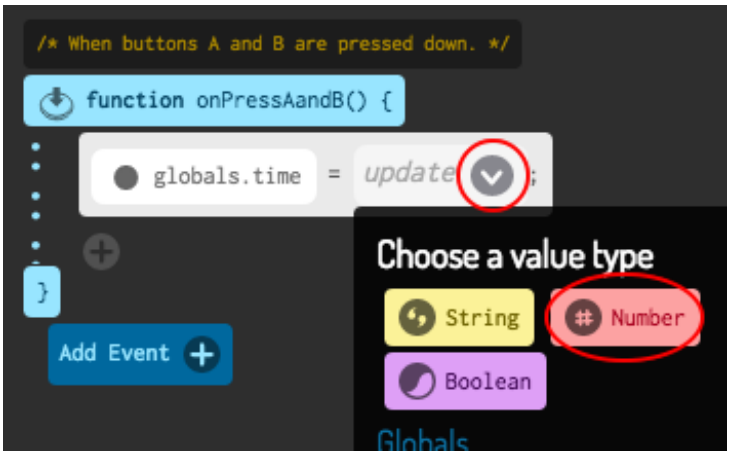

- [ ] Click the 'Library' tab and then 'Globals', and create a new variable called `time`.



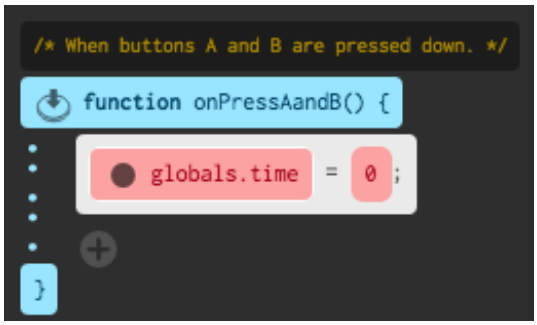

- [ ] When buttons A and B are pressed together, you want the `time` to be set to `0`. To do this, drag your `time` variable into your `onPressAandB` event.



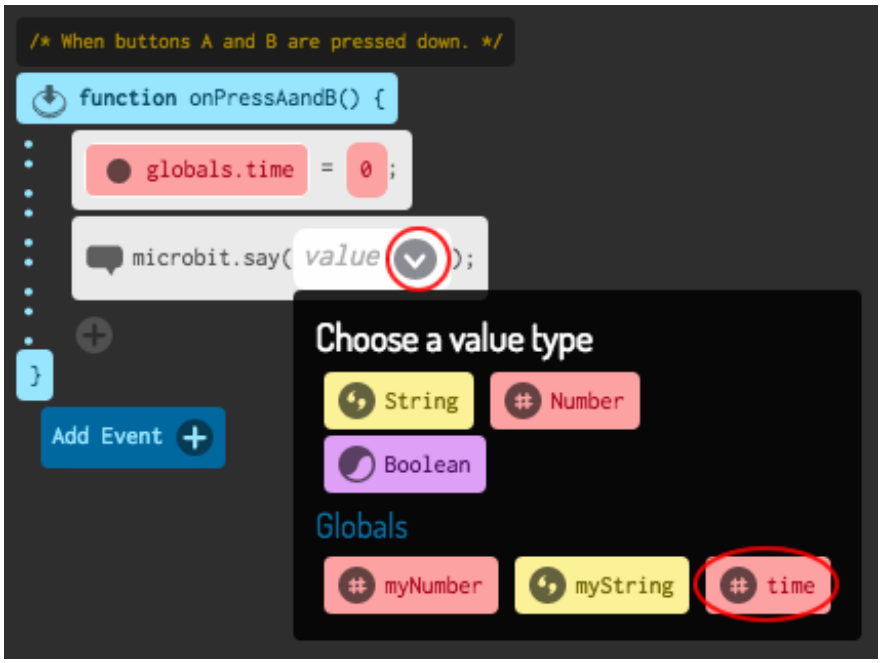

- [ ] Click the update arrow, choose # number and enter 0.



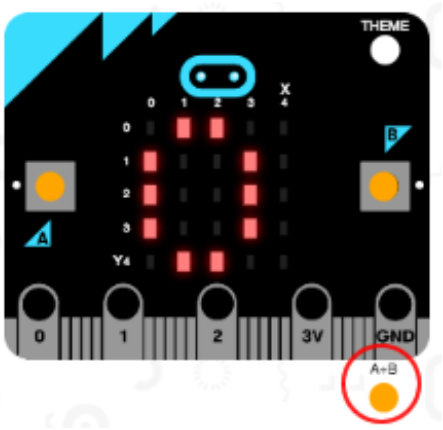

Here's how your code should look:




- [ ] You should also display the time. To do this, drag in a say block, click the value arrow and choose your time variable.




- [ ] Click ‘run’ to test your code. Press the ‘A+B’ button (below the micro:bit) to set your timer to 0.

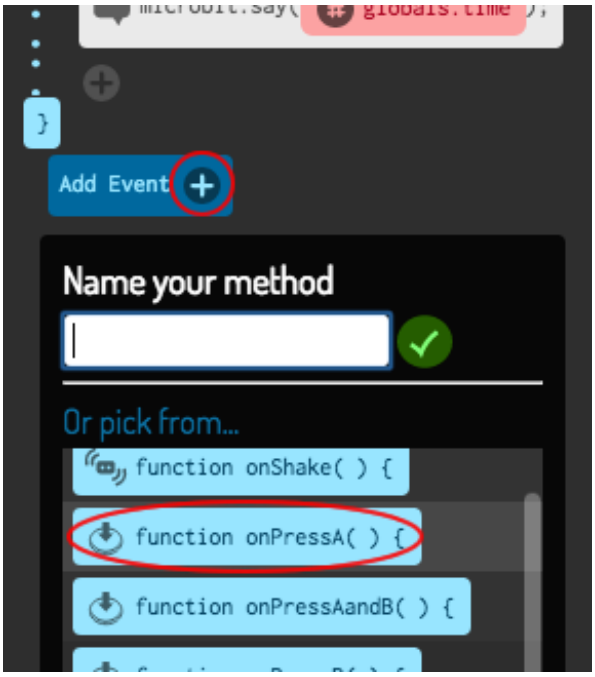



## Step 2: Starting and stopping your timer

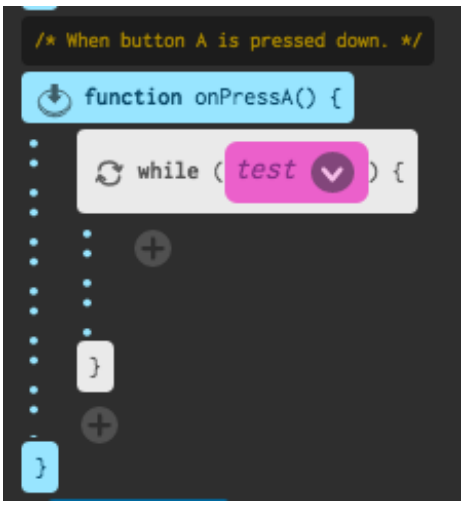
Let’s use button A to start your timer, and button B to stop it.

## Activity Checklist

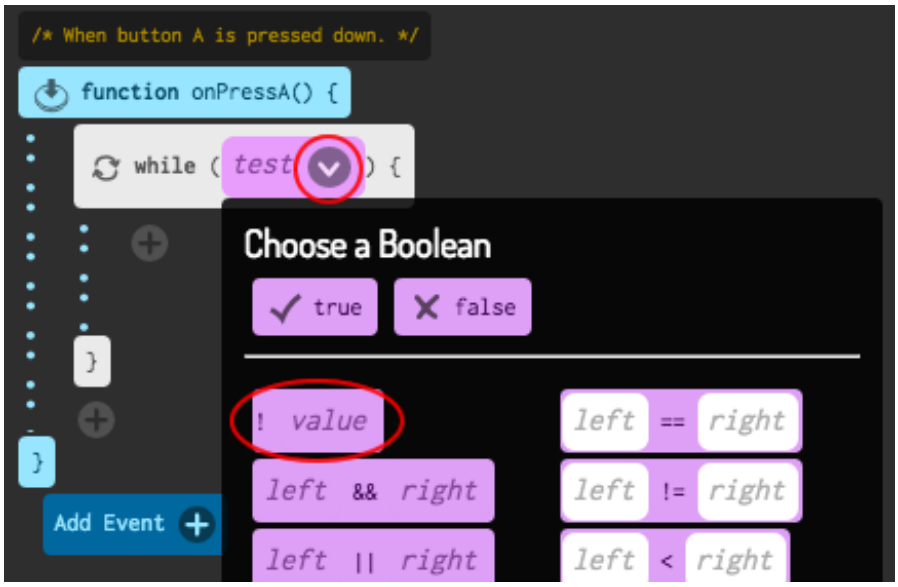
- [ ] Your timer should start when button A is pressed. Add a new `onPressA` event to your script.



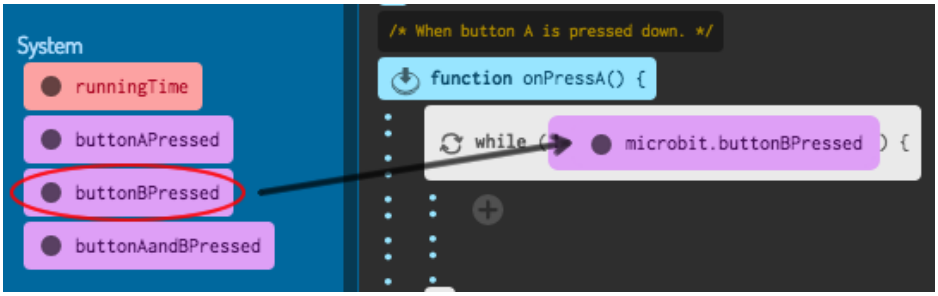

- [ ] The timer should count up as long as button B **has not been pressed**. To do this, first drag a `while` block unto your new `onPressA` event.




- [ ] Click the `test` arrow, and choose `! value` (`!` means **not**).



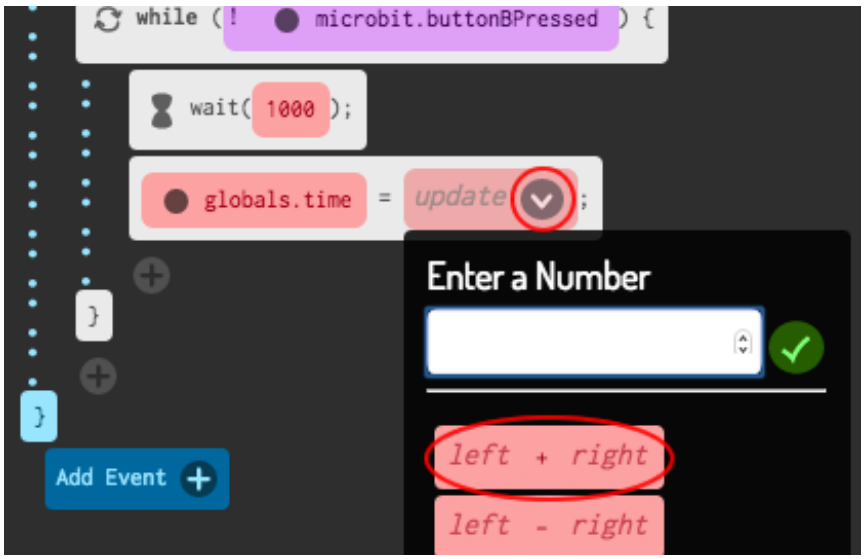

- [ ] You can then drag a `buttonBPressed` block into the `value` gap in your `while` loop.




Any code inside this `while` loop will be run repeatedly, **as long as button B has not been pressed**.

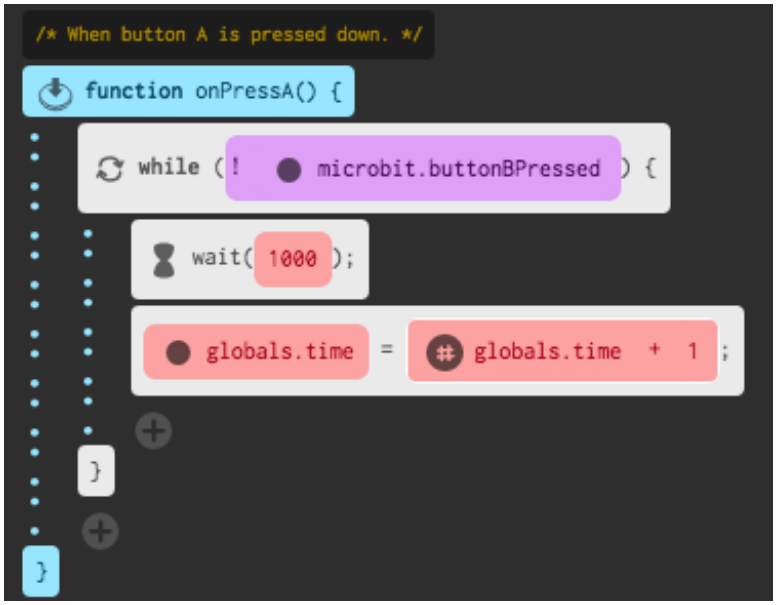
- [ ] Next, you want to add 1 to your `time` variable every second (1 second = 1000 ms). Add a `wait` block to make your timer wait for 1 second.


- [ ] To increase your `time` variable, drag in the variable, click the `update` arrow and click `left + right`.

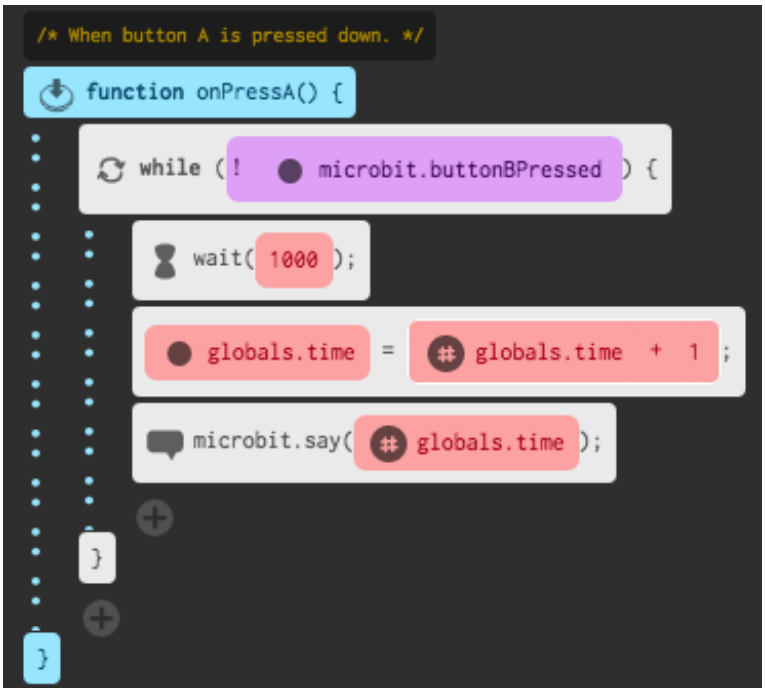



- [ ] Click the `left` arrow and choose your `time` variable.


- [ ] Click the `right` arrow and enter `1`. This will add 1 to the current value of `time`.

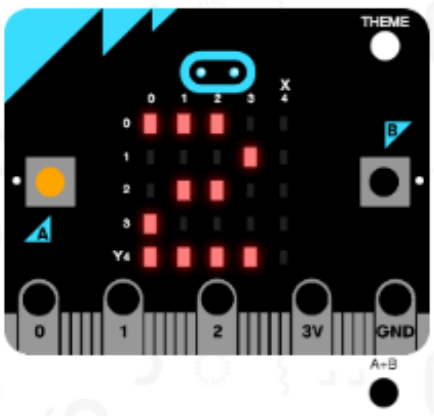



- [ ] Finally, you'll need to display the updated `time` variable. Here's how your code should look:




- [ ] Click ‘run’ to test your code.

- Press buttons A and B together to est your timer to 0
- Press button A to start your timer
- Press (and hold) button B to stop your timer.




## Challenge your friends!

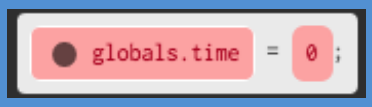
Use the timer to challenge yout friends. For example, you

could see how long it takes them to say the alphabet backwards, or name 10 capital cities.

## Challenge: Counting Down

Can you create a **new** timer, that counts down to 0? Here's how your new timer should work:

- [ ] Pressing buttons A and B together should set your `timer` to 0




- [ ] Pressing button B should add 1 to your timer


- [ ] Pressing button A should take 1 from your `time` variable until it gets to 0. This means you'll need a `while` loop that runs as long as the `time` is greater than (`>`) 0.