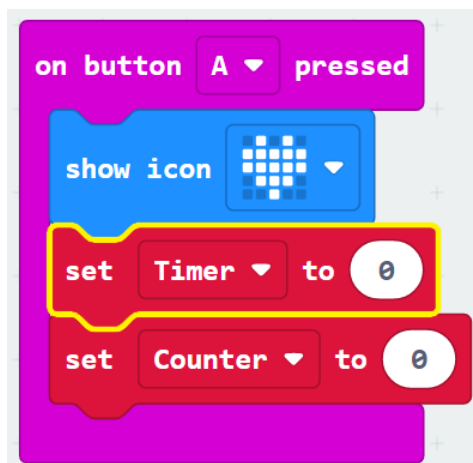


BPM Tracker – Coding Guide

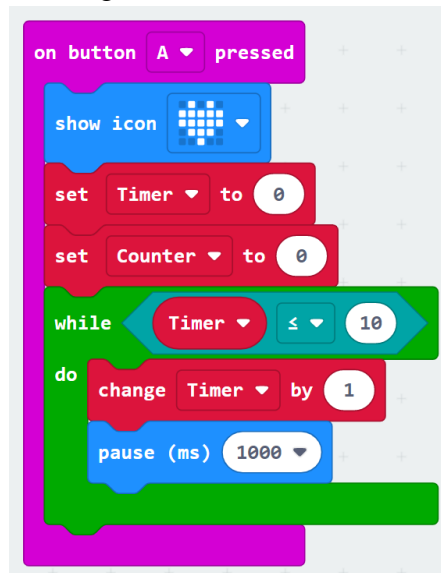
- Make sure your micro: bit is connected following their official guide: <https://microbit.org/get-started/first-steps/set-up/>
- Have students remove the “on start” and “forever” loops by dragging them to the left side of the screen and dropping them on the coding tabs.
- Then go under the **Input tab**, drag, and drop two of the “**on button A pressed**”. Change one of the “**on button A pressed**” to “**on button B pressed**” by hitting the drop-down box and selecting “**B**”. It is important that we have both the A and B buttons coded because the A button will start our timer and then calculate BPM while B acts as our counter.



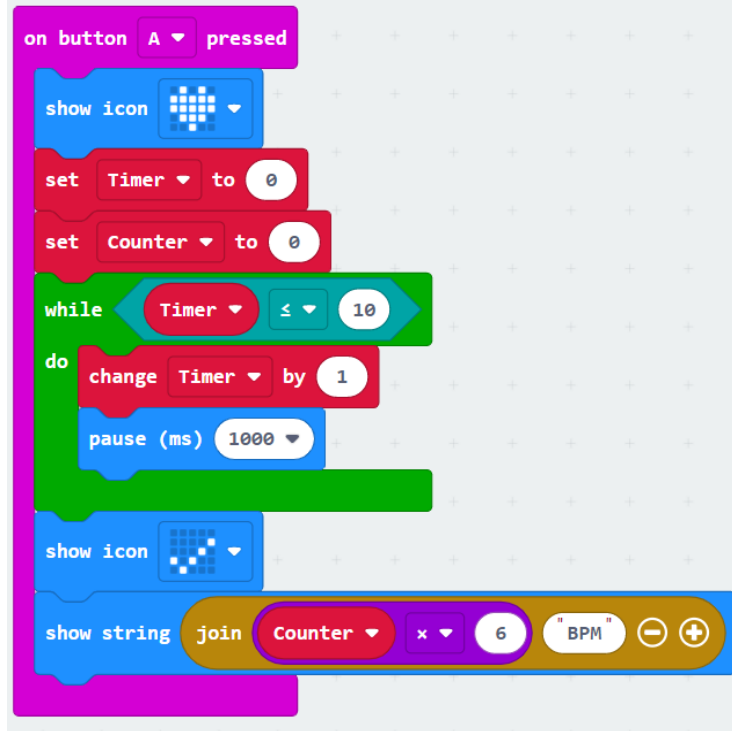
- Under the **Basic tab** grab the “**show icon**” block and place it in the “**on button A pressed**” code. Keep the icon as the heart as it will be used to inform us when our timer is running!
- Have students create some variables by clicking on the **Variables tab** and selecting **Make a Variable**. Have students name them “**Timer**” and “**Counter**”.
- In the “**on button A pressed**” block drag and drop two of the “**Set-blank-to**” block from the **Variables tab**. Set one to “**Timer**” and one to “**Countdown**”. Set both variables to 10 seconds.



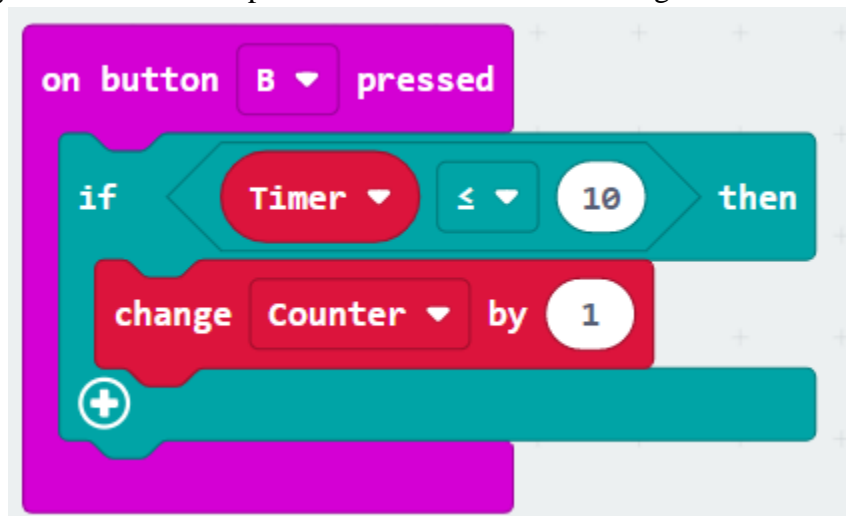
- Under the **Loops tab** grab a “**while -false- do**” block. Drag and drop this at the end of your “**On button A pressed**” coding block. To change “**false**” grab another coding block under the **logic tab** that says “**0 < 0**” and put it in place of “**false**”. The first zero in the formula can be changed to “**Timer**” which can be found under the **Variables tab**. Change the second zero to 10. Use the drop-down box located next to “**=**” and select the “**≤**” option.
- Under the **Variables tab**, get a “**change counter by 1**” block and add it into your “**while**” loop. By using the drop-down box, change “**counter**” to “**timer**”.
- Under the **Basics tab**, get a “**pause (ms) 100**” block and add it underneath your “**change timer by 1**” block. Change 100ms to 1000ms.



- Now, under your “**while**” loop, grab another “**show icon**” block under the **Basic tab**. Change the heart to a checkmark using the drop-down box. When we run our code, the checkmark will notify us that the timer is up.
- From the **Basic tab**, grab a “**show string ‘Hello!’**” and drag and place it under the “**show icon**” block. Click the **Advanced** drop-down tab and in under the **Text** tab grab a “**Join ‘Hello’ ‘World’**” block. Drag and drop it in the “**Show String ‘Hello’**” block.
- Grab a “**0 x 0**” block from the **Math** tab and place it in the “**Hello**” block. Under the **Variable** tab, grab a “**Counter**” block and replace the first zero in the equation with this block. Change the second zero to 6. The “**Word**” portion of the “**Show String**” block can be changed to “**BPM**”.



- Grab an “If ‘true’ then” block under the **Logic** tab and place it in the “On button **B** pressed” block. Back in the **logic** tab, grab a “0<0” comparison block and replace “true”. Change “<” to “≤”. From the **Variables** tab drag and drop the “Timer” block into the first zero. Change the second zero to 10. Back under the **Variables** tab, grab the “Change counter by 1” block and place it in your “if then” statement. The “If then” statement is there to indicate that **IF** the timer starts by pressing A, **THEN** it counts how many times B is pressed in the 10 seconds.
- will only run if A has been pressed and the timer is counting down.



- Make sure your micro:bit is connected and click **DOWNLOAD** and now your students have a working Heartrate Monitor!

```
on button A pressed
  show icon [grid icon]
  set Timer to 0
  set Counter to 0
  while Timer <= 10
  do
    change Timer by 1
    pause (ms) 1000
  end
  show icon [grid icon]
  show string join Counter x 6 BPM

on button B pressed
  if Timer <= 10 then
    change Counter by 1
```