

Timing cars using switches, micro:bit & Makecode

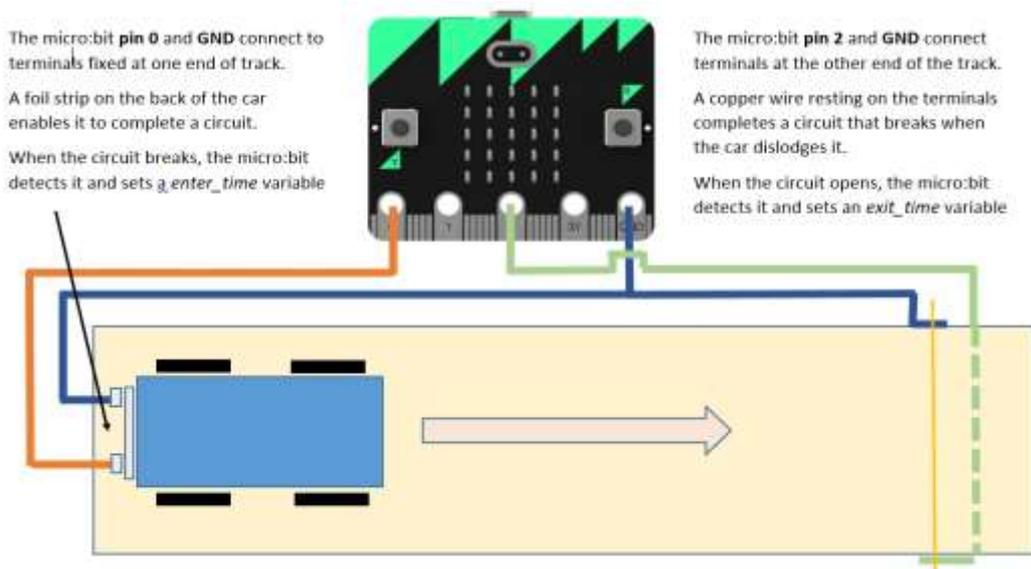
The basic micro:bit device does not have a real time clock but it does have a neat feature that counts, in milliseconds (*thousandths of a second*), how long the device has been running since it was switched on or reset.

By using the **Microsoft Javascript Blocks Editor** code editor at www.microbit.org you can access this 'running time' information and use it to count time. With a little **maths** and the use of **variables** an accurate counter can be made that detects circuits breaking to stop and start counting and the LED display to show the time. Reset the micro:bit between readings.

Code (Simple version with no checking of circuits):



Wiring the micro:bit:



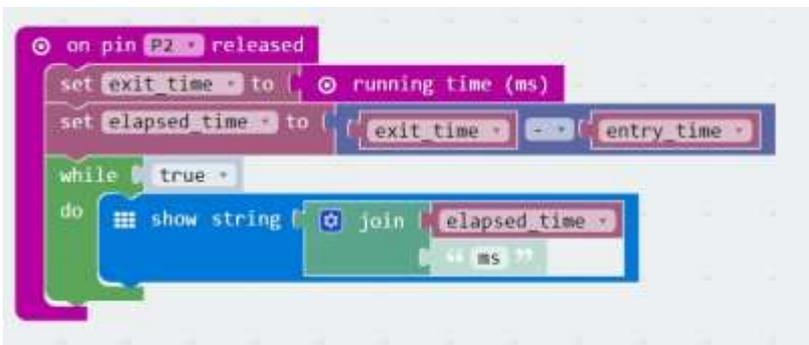
PUTTING THE PROGRAM TOGETHER

This section of code starts the timer.



Drag out an **on pin ___ released** block from the **Input > More** section. Set it to button P0. From the **Variables** section drag out a **set ___ to** block and attach **running time (ms)** from the **Input > More** section to it.

Name the variable 'entry_time'. Put both inside the pin released block.



Finally construct this code to stop the timer and display the time.

When the P2 circuit is broken another variable called *exit_time* is set to the running time value.

The next line uses a **Maths** block and calculates the time elapsed between the presses by simply subtracting the *entry_time* from the *exit_time* to make a new variable, *elapsed_time*

The final part of this block performs a continuous loop that displays the calculated *elapsed_time* and the units (ms) combined as a text string. The **join** block to do this is in the **Advanced > Text** section. Now download your program and give it a go!

Taking it further:

You could use the ideas here to make a full size timing gate for the Race For The Line Rocket Cars

This program could be greatly improved by having it check that both the P0 and P2 circuits are complete and letting the users know that it is ready to start measuring.

Pressing buttons A & B together could reset the process or check that conditions were ready.

Experiment with different types of circuit – circuits that break or circuits that are made (*HINT: pin pressed or released*)

NOTE: Makecode does not currently support floating point numbers (with decimal points). If you wanted to display decimals, you could use a language like MicroPython.