



Activity: A Micro:bit Switch Based Timing Gate

Subject/s: Computing	
Focus: <ul style="list-style-type: none">• Instructions within a computer system• Undertake creative programming• Making programs respond to external events – e.g. connected switches• Set and manipulate variables, inc. doing mathematical calculations based on variables	
Ages: 11-14	Time: 60 minutes
Prior Learning: <ul style="list-style-type: none">• Some understanding of computer coding using a blocks type system such as Scratch• Familiarity with making USB and battery connections and dragging and dropping files• A knowledge of electrical circuits and switches inc. switches made from various common materials – push pins, tin foil, copper wire, etc. Use of crocodile clips.	
Lesson Objectives: <p>Students will understand how to create a program for micro:bit that will set variables based on external switch changes and perform mathematical operations on them.</p> <p>Students will understand how a micro:bit (or similar devices) can be interacted with by humans through external interfaces.</p>	
Resources: <p>Worksheets, Micro:bits (+battery packs and USB connections), Laptops or PCs with internet access, foil, copper wire, wood, nails, insulated hook up cable, crocodile clips (or a breakout board)</p>	Vocabulary: <p>code, program, input, button, if-then, loops & repeats, compile, download, screen, pixel, event, block, switch, interface, sensor</p>
Activities: <ul style="list-style-type: none">• Have the students follow the instruction to complete and download a test program to their micro:bits using short wires and DIY switches made using foil, wire, etc.• Construct a basic timing gate for testing moving vehicles over a set distance (e.g. down a ramp)• Develop ideas on how a Race Day timing system could be made.	
Assessment opportunities: <p>Demonstration, discussion and application in project work</p>	
Extension ideas: <p>Use Boolean logic to ensure that the switches are in the correct state before recording times. Perform a calculation to work out velocity from the time captured and the known distance between gates.</p> <p>Make a timing system for the at-school race day.</p>	

