

## Moray Micro:bit Data and Environment Lesson Plan 3 – Earthquake Data

<p><b>Working towards outcomes of a Curriculum for Excellence:</b>          I can describe the physical processes of a natural disaster and discuss its impact on people and the landscape. (SOC 2-07b)          I understand the instructions of a visual programming language and can predict the outcome of a program written using the language. (TCH 1-14a and TCH 2-14a)          I understand how computers process information (TCH 1-14b and TCH 2-14b)</p>	
<p><b>Programming Concept(s)</b>          Algorithms &amp; Evaluations.</p>	
<p><b>Learning Intention</b></p>	
<p>We are learning to record earthquake data using the micro:bit</p>	<p><b>Success Criteria</b></p> <ul style="list-style-type: none"> <li>- I can understand how acceleration is related to earthquakes.</li> <li>- I can create code to record the strength of acceleration.</li> <li>- I can carry out an experiment to simulate an earthquake and analyse the results.</li> </ul>
<p><b>Resources</b></p>	<p>Between two or three – 1x micro:bit, 1x battery pack, 1x USB cable, 1x device (iPad or Laptop). Paper Plate/Card per learner, Tape.</p>
<p><b>Timing</b></p>	<p>1 hour</p>
<p>5-10mins</p>	<p><b>Introduction</b>          Watch introductory <a href="#">video</a> from Mr Morrison. This first looks at earthquakes and why it is important to measure them. There are opportunities to pause for discussion. It then looks at how earthquakes are measured followed by a coding tutorial on creating an earthquake measuring device.</p>
<p>10-15mins</p>	<p><b>Part 1 – Data Logging Code</b>          Learners create code to create the Seismograph Code following the instructions in the video (Full Code <a href="#">HERE</a>).</p>
<p>15-20mins</p>	<p>Once learners have completed the code they should attach their micro:bit to a paper plate or piece of cardboard using a little bit of cello tape or bluetack. This gives the learners something to shake. They should keep this flat on a table start the data logging and move it vigorously to simulate an earthquake. They could decide to record multiple earthquakes.</p>
<p>5mins</p>	<p><b>Part 2 – Analyse the Logged Data</b>          Once learners have completed their experiment watch the second <a href="#">video</a>.</p>
<p>15-20mins</p>	<p>They should plug the micro:bit back into the computer and load the 'MY DATA' file. They should then answer the questions on Slide 11 about this. A discussion could be had as a class about the results and differences. (For Q4 the answer is 1000 as the earth is still moving so it is recording the acceleration due to gravity!)</p>
<p>5mins</p>	<p><b>(Extension)</b>          After learners have analysed the data they could create an earthquake warning alarm, which will sound when the acceleration reaches a certain value. Full Code with this addition is found <a href="#">HERE</a>. Highly able learners could make the code warn another micro:bit that is further away.</p>
<p>5mins</p>	<p><b>Ending the lesson (Plenary)</b>          After discussing as a class the results and comparing graphs there are plenary discussion questions.</p>