Moray Micro:bit Data and Environment Lesson Plan 4 – Sound Levels

Working towards outcomes of a Curriculum for Excellence:
I can explain how sound vibrations are carried by waves through air, water and other media. (SCN 2-11a)
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)

Programming Concept(s)
Algorithms & Evaluations.

Learning Intention	***Success Criteria***
We are learning to investigate sound and materials.	- I understand how sound travels. - I can create code to measure sound levels remotely using two micro:bits. - I can carry out an experiment to investigate the effect of materials on sound. - I can record and analyse my results

Resources	Learners will need 2x micro:bits in their group and 1x device (iPad or Laptop). They will also need a sound source (eg. Sound Bar or Just laptop) and a few different materials to wrap the transmitter with e.g. Bubble Wrap, Paper, Card, A jumper etc.
Timing	1hour
5-10mins	**Introduction** Watch introductory video from Mr Morrison. This first looks at how sound travels with a pause for discussion on why it may be useful to know the effect of different materials on sound. The video then further covers insulation and how sound can be measured.
10-15mins	**Part 1 – Data Logging Code** Learners create code following the instructions in the video (Full Code for the transmitter HERE and receiver HERE). Remember each pair of micro:bits will need their own unique radio group number. You can use any number between 0 and 255.
15-20mins	Once learners have completed the code they should set up a sound source (laptop or physical instrument) at a fixed distance from the micro:bit. They should then wrap the micro:bit in each material and take readings, recording them on the worksheet. Elastic bands or cellotape may help to secure the materials.
10-15mins	**Part 2 – Analyse the Results** Once learners have completed their experiment watch the second video and answer the questions on Slide 13 about their results. **(Extension)** Complete the experiment again with different materials or the sound further away/quieter and see what the changes are..
5mins	**Ending the lesson (Plenary)** After discussing as a class the results of each group's experiment there are plenary discussion questions.