Moray Micro:bit Data and Environment Lesson Plan 5 – Energy Data

Working towards outcomes of a Curriculum for Excellence:
By considering examples where energy is conserved, I can identify the energy source, how it is transferred and ways of reducing wasted energy (SCN 2-04a).
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 record and analyse energy use.	- I can create code for a light meter. - I can measure the light level of a room. - I can record the changes in light over time. - I can use my results to calculate the cost of energy.

Resources	Between two or three – 1x micro:bit, 1x battery pack, 1x USB cable, 1x device (iPad or Laptop). Worksheet each.
Timing	1hour
5-10mins	**Introduction** Watch introductory video from Mr Morrison. This looks at what energy is, some things that use energy then at the sustainable development goals. There are several opportunities to pause for discussion. This lesson can be focused more on discussion and less coding depending on your learners.
10-15mins	**Part 1 – Light Level Meter Code** Learners create the light level meter code following the instructions in the video (Full Code HERE).
10-15mins	Once learners have completed the code they should record the light level in three different locations (where the lights are switched on, best to be away from natural light e.g. in centre of room). There is a worksheet provided for this.
15-20mins	**Part 2 – Energy Timer and Cost Calculator** Once learners have completed recorded the location and light level using their program they are ready to watch the second video. This looks at a quite complex program (Full Code HERE) to record light levels over time and output the cost of energy. There are three values that need to be recorded: Light Level from part 1, wattage of lights (now this one is difficult with florescent classroom lights its likely to be around 40W per tube) and finally unit cost of energy – this can just be kept the same as in the program. Learners should repeat part 2 for each of the locations changing values if required. You can choose to complete this experiment over anything from 10mins to a whole week! Just leave the micro:bit in position with battery pack attached. **(Extension)** Complete the experiment again in a different location.
5mins	**Ending the lesson (Plenary)** After discussing as a class the results of each group's readings there are plenary discussion questions.