Lesson 23 – Activity Sheet 1

Setting the Scene

You have been approached by a company to build a prototype of a Programmable, Engaging Toy better known as micro:PET. The prototype is a model for a new toy that is going to be released in shops next year. It responds to user interaction as well as its environment. For example, if a child picks the micro:PET up it might speak. If the micro:PET is dropped it might roar! If the temperature is cold is might begin to sing. The company have given you free choice to design and decide what the micro:PET will do and how it will respond.

## Success Criteria

* The micro:PET must respond to its environment and surroundings
* The micro:PET must respond to user interaction
* Use some of the micro:bit hardware that has been covered in previous lessons (Halo, Sound, Servo etc)
* Use the micro:bit to control the features and responses
* Look engaging and fun

Getting Started

**Some Ideas**

The table below show a number of ideas of how the various functions, hardware and feature of the micro:bit can be used to add interactivity to the micro:PET.

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| --- | --- |
| **Pet Feature** | **micro:bit Component / Program** |
| A face / emotions / expressions | LED matrix, images |
| Touching the pet | Pins / responses |
| Using buttons to feed, walk or cuddle the pet | Using the Buttons A, B, C, selection, responding to inputs |
| Pet noises / sounds / talking | Music / speech modules |
| The Pet is placed into a box and your hand is covering its face it might ‘protest’ | Light sensor, respond to reduction in light |
| Wagging tail, moving arm, mouth opens | Servo motors |
| Moving | Servo and motors |
| Picking up the PET | Acceleration and movement |
| Shaking the PET | Gestures and movements |
| Random responses and behaviours from the PET | Random numbers, machine timings |
| Going to sleep | Responding to the amount of light |
| Responding to the temperature | Temperature sensor |
| Wings that move and flap | Servo motor |

**Planning**

Discuss with other Learners what features the micro:PETwill have and then complete the table below adding your own ideas of ‘what the micro:PETwill do’ and then the ‘micro:bit Component / Program’ to describe how it will do this. You may find it useful to refer back to previous lesson activities to remind yourself of what the micro:bit can do and also the required code. Be as creative as you can in your thinking. Once you have come up with a long list of potential interactions you should then consider which elements are practical to take forward to implementation. You should consider how much the user is likely to enjoy the interaction, whether you have the hardware available to implement the interaction and whether you know how to code the interaction.

|  |  |
| --- | --- |
| **What the micro:PET Will Do** | **micro:bit Component / Program** |
| *The micro:PET says Hello on start up* | *Speech module* |
| *Displays a smiley face when touched* | *Inputs, using tin foil to make circuit and respond* |
| *Displays a sad face is shaken* | *Gestures and shaking* |

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| **What My micro:PET Will Do** | **micro:bit Component / Program** |
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**Design**

Now that you have thought about the interaction and features of the micro:PET. You will need to decide what type of micro:PET you are going to build. A cat, a dog or maybe something more exotic like a Dragon or a Robot! Or you could create your own unique micro:PET. How about a pencil case that unzips itself (using a servo) when you shake it? First you will need to complete the design sheet to justify your design ideas.

The most important thing to remember is to be creative and come up with something novel that meets the success criteria in an interesting way. Think about the needs of the user and think about how they will interact with the pet and what they would expect a pet to do and how it would behave.

## **Materials Needed**

* Coloured paper
* Coloured card
* Corrugated card
* Glue
* Sellotape/fabric tape
* Fabric scraps
* Velcro tape
* Pens, pencils, coloured pens/felt tips
* Assorted googly eyes
* Scissors
* Tinfoil

## **What Next?**

* Discuss your ideas with other students
* Record your ideas using the planning table
* Fill out the design sheet
* Keep talking and sharing your ideas for your project

## Pro-tip

Keep talking about your ideas with other Learners, even after the lesson. Write down your ideas and plans no matter how strange, challenging or fun they might seem. For example, you may want your micro:PET to freeze a person if they get too close. Well, you could program the Halo with icy blue LEDs that shot out from the PETs mouth.

## Stretch Tasks

* Start thinking about and planning the program code that you are going to use to bring the micro:PET to life. The next lesson will look at an example of using speech with the micro:PET
* Sketch out or draw some diagrams of what the micro:PET might look like