# Lessons 11–12 – micro:pet Project

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| The Big Picture – Why is this Relevant? | Learning Objectives |
| * Learners will be designing and creating an interactive digital product set within an authentic context * This is an example of a smart toy and could easily be turned into a real product | * Work collaboratively to achieve the given success criteria * Design and create a micro:pet * Design and program interactions on a micro:bit to form part of the pet * Evaluate the product * Create an “elevator pitch” |
| Engagement – How Can I Engage Learners? | Assessment for Learning |
| * The project involves a fun making element where learners design and create the pet with a distinct personality * The interactions can vary in complexity. Learners typically have lots of fun coming up with new and fun interactions * Working out how to sense interactions and how to respond to them is a creative process that learners should respond well to as they are both playing and creating a game as they go along | **Expected Progress:**   * Learners will use the provided net to build a micro:pet and program some interactions as well as a simple elevator pitch and evaluation   **Good Progress:**   * Learners will design and make a robust micro:pet including more than three programmed interactions that are tested and functional. The elevator pitch and evaluation will be complete   **Exceptional Progress:**   * Learners will fully design and create a micro:pet that is robust and uses many interactions to entertain a user. The user needs should have been considered; the project will have been evaluated and the elevator pitch will be creative and convincing |
| Links to KS3 Programme of Study | |
| * Create, re-use, revise and re-purpose digital artefacts for a given audience, with attention to trustworthiness, design and usability * Undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users | |
| Key Concepts | Key Words |
| * Using design thinking * Realising interactions in code/blocks * Input Process Output (IPO) | * Interactive/interaction * Features/functionality * Input Process Output * Sensors * Programming |
| Differentiation | Resources |
| This project can be differentiated easily by varying the expectation of the interaction design and implementation as well as the quality and robustness of the pet. The pet body can be extended to focus more on art/design and the interaction can also be extended to add in multiple pet communication. | * Lesson 11-12 ppt * Lesson 11-12 project sheet * 1 × micro:bit per learner * Making materials * The micro:pet net (if needed) * Scissors and glue * Googly eyes |
| Lesson Flow | |
| The flow of these lessons is fluid and as the learners are working in groups they can work in tandem and so can spend longer on different areas such as the build and the programming. Each lesson will add an additional element that the groups will need to deal with.  The micro:pet net is a starting point but if learners are capable of creating their own pets using boxes, card etc then this should be encouraged however the design and programming elements should not be missed due to the build overrunning.  The lesson layout below is a suggestion that spreads the activities appropriately. The group nature of the task ensures the tasks can be worked on at the same time. Learners should be encouraged to distribute the tasks but also to have a go at the programming element. One of the key elements of the task is the quality of interaction that the user can have with the pet. This should be stressed to students. A number of sample interactions are included in the ppt. More capable students should aim to include a number of interactions including use of radio communication so that two pets can react with one another. If students are using version 2 of the micro:bit they could make use of the built in microphone and speaker. The logo on the front of the micro:bit can also be used as a touch sensor which may present learners with further opportunities for interaction.  **Lesson 11:**   * Explain how this project is larger than the previous tasks and that they will need to work together in groups over 2 lessons * Explain the context and discuss some ideas with the class about some possible features of the pet * Spilt the class into groups (ideally 2 boys and 2 girls in each team) * Go through the Success Criteria with the class * Describe how the micro:bit will form part of the micro:pet and discuss how the LED array will make up the face and how this will be the primary interface for the user * Describe the IPO model and use an example of an interaction to demonstrate how it relates to programming the micro:bit using the examples on the slide. Use one of the example interactions to highlight the model. The input could be the user pressing the button A on the pet, this would then be processed by the micro:bit and the relevant branch of the selection statement would be taken to generate the output. An example is included on slide 10 of the ppt which talks through the IPO model alongside a sample interaction   1st pair:   * Give the groups the design template (A3) to design their micro:pet. Explain what should go in each section * Explain that they need to create a logo for the micro:pet * Give out the micro:pet net and encourage learners to be creative with decorating it * Encourage learners to modify and adapt the net or even create their own or add parts using cardboard boxes or whatever is available depending on their designs * Explain that they can continue building the pets throughout the project   2nd pair:   * Give out copies of the IPO worksheet and get learners to design at least three interactions per group * Encourage more capable learners to plan out their interactions using flowcharts. This will also help to reinforce learning from previous lessons. * Encourage them to think about how they would interact with an intelligent toy and how they could use the micro:bit’s sensors to react to the play in some way   **Lesson 12:**   * Remind the teams of the Success Criteria * Remind learners how to get .hex files onto the micro:bit * Demonstrate the creation of an interaction in MakeCode * Introduce the concept of the ‘elevator pitch’ and ensure the groups have a learner working on it to present to the teacher in the second half of the lesson. One pair may wish to complete the pitch whilst the other works on programming the interactions * Learners create their planned interactions in MakeCode as well as finishing their build * Explain that the learners now need to combine the micro:bit into the pet * Remind learners that the USB port needs to be accessible to update the micro:bit * Encourage learners to update their micro:pet design sheets as they go along * Visit the groups and listen to their ‘elevator pitch’ throughout the second half of the lesson * Wrap up the project using the slides provided. Students should complete the evaluation section of the design template | |
| Making | |
| * The micro:pet’s body will need designing and making * There is a supplied net but learners should be encouraged to be creative and make more sophisticated bodies to represent their designs. * Learners should be provided with card and making other making materials to make and decorate their micro:pets | |