**How to design a Cable tidy**

**Teacher notes**

**Resources:**

* Teacher powerpoint
* Example STL file
* Fusion 360
* Suction cups 20 mm. These can be bought on ebay.
* Ninjafelx flexible filament. This project will only work when printed with flexible filament. Standard PLA/ABS will be too stiff.

**Pre-preparation**

* Print out the student worksheets – These are to be used throughout the lesson to reinforce the key learning.
* Ensure you have access to Fusion 360
* Print out the example STL file, make a few copies for the class to look at.
* Selection of cables for students to measure. They could measure the computer cables or mouse cables.

**Learning Objectives**

* How to create a revolve in Fusion 360**.**
* To design a cable tidy using Fusion 360.

**Starter task 5 minutes**

* Students are to log onto Fusion 360 and start a new sketch.

**Objective 1 – How to create a revolve**

**Task 1 – 10 minutes**

* Ask students the question ‘what does revolve mean?’. Typical answers would be to turn around or to rotate around something.
* Explain to students that they are going to learn how to create a revolve on fusion 360 and this will help them create new types 3D models rather than just extruding and shelling shapes.
* Demonstrate to the class how to create a revolve on Fusion 360. Refer to the screen shots on the powerpoint.

**Give students 10 minutes to experiment with creating revolves.**

**Objective 2 - To design a cable tidy using Fusion 360.**

**Task 2 – 10 minutes**

* Show the students the example cable tidies and the suction cups. Explain to them that they are going to learn how to model this, so they can make a functional product. They are to draw on their skills from the previous two lessons and model a functional product, export the model as an STL file and then slice the model in slicing software ready for 3D printing.
* Demonstrate how to model the cable tidy in Fusion 360. Show students how to alter a dimension and how to move a sketch. They will need to learn how to trim a sketch to get the correct shape in slide 11.
* To move a sketch students, need to use the command ‘modify – move’ and then select the sketch they want to move. They can then use the arrows to move the sketch.

**Student task – 20 minutes**

Students are to work through the lesson powerpoint and attempt to model a cable tidy with room for a suction cup.

**5 minute Plenary**

* Recap the initial objectives with the class.
* Ask the students to reflect on their learning and explain ‘What is a revolve and how is it different to an extrude?’.