Subject: DT – Digital World – Navigating the World.
Year: 6
NC/PoS:
- Use research & develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups.
- Generate, develop, model & communicate their ideas through discussion, annotated sketches, cross-sectional & exploded diagrams, prototypes, pattern pieces & computer- aided design.
- Select from & use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately.
- Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities.
- Investigate & analyse a range of existing products.
- Evaluate their ideas & products against their own design criteria & consider the views of others to improve their work.
- Apply their understanding of how to strengthen, stiffen & reinforce more complex structures.

Prior Learning (what pupils already know and can do)
- Describe what is meant by monitoring devices and provide an example.
- Identify errors (bugs) in the code and ways to fix (debug) them.
- Explain key pros and cons of virtual modelling vs physical modelling.
- Recall and describe the name and use of key tools used in Tinkercad (CAD) software.

End points (what pupils MUST know and remember)
- Incorporate key information from a client's design request such as 'multifunctional' and 'compact' in their design brief.
- Write a program that displays an arrow to indicate cardinal compass directions with an 'On start' loading screen.
- Identify errors (bugs) in the code and suggest ways to fix (debug) them.
- Self and peer evaluate a product concept against a list of design criteria with basic statements.
- Identify key industries that use 3D CAD modelling and why.
- Recall and describe the name and use of key tools used in Tinkercad (CAD) software.
- Combine more than one object to develop a finished 3D CAD model in Tinkercad.
- Complete a product pitch plan that includes key information.

Key Vocabulary
application (apps), biodegradable, boolean, cardinal, compass, client, corrode, design brief, design criteria, duplicate, environmentally friendly, equipment, function, GPS tracker, if statement, lightweight, loop, navigation, pedometer, product lifecycle, product lifespan, program, recyclable, replica, smartphone, sustainable design, value, variable.

Medium Term Plan: Supporting Implementation of LTP/Progression Grid

---

Session 1: Navigating the World.
To write a design brief and criteria based on a client request.

Use Presentations to display devices used when travelling then the 'design request'. Explain how
 the design brief needs to explain the solution for solving the problem with the invention of a new product. Children to write their design brief then discuss the incomplete design criteria. Explain that the design criteria outlines the specific information they need to meet for the product to succeed.

Vocab: application (app) client compass design criteria equipment GPS tracker navigation pedometer smart smartphone tablet.

Session 2: Programming a navigation tool.
To write a program to include multiple functions as part of a navigation device.

Children to write a program for the micro:bit to program a navigation tool starting with a cardinal compass & then building additional functions as an extension of the main program, Use Pupil videos to model how to program each different step (compass / navigational tool / pedometer) for children to follow then test, check for errors, debug & save.

Vocab: boolean copy duplicate function if statement loop program value variable.

Session 3: Product Concept.
To develop a sustainable product concept.

Introduce how sustainable design is critical for the survival of the planet & its ecosystem, so everyone should make sustainable decisions at every opportunity. Use Presentation Design Concept & explain how to design a product concept for the navigation tool programmed in the last lesson.

Vocab: biodegradable concept corrode environmentally friendly finite functional properties infinite lightweight materials mouldable non-recyclable product lifecycle product lifespan recyclable sustainable sustainable design unsustainable design.

Session 4: 34 CAD Models.
To develop 3D CAD skills to produce a virtual model.

Use Pupil Videos to introduce Tinkercad then explain to children how they will develop a 3D CAD model of their product concept using Tinkercad by combining multiple objects. They can use any objects in the Tinkercad objects library to recreate their product concept as a virtual model.

Vocab: 3D model CAD CGI consumables group manoeuvre opaque replica shape properties Tinkercad transparent ungroup virtual workplane.

Session 5: Product Pitch.
To present a pitch to 'sell' the product to a specified client.

Use Presentations to highlight idea of a 'pitch' then children to complete their product pitch plan & develop a poster to show during their pitch.

Vocab: convince feature functional investment manufacture model pitch stock.

Future learning this content supports:
KS2 (Y6) – Electrical Systems – Steady Hand Game.