St James' Church of England Primary School
Design & Technology Overview Sheet

Year 6 – Digital World: Navigating the world

Rationale: Children program a navigation tool to produce a multifunctional device for trekkers. They combine 3D objects to form a complete product in CAD 3D modelling software. The unit accumulates with a pitch to share and 'sell' the children's final product concepts and programs to the Adventure Awaits company guest panel.

Pre-unit task: Display the Presentation: Navigating the world.

Attention Grabber: Look at the title and images and ask the children: What does the title of the project and the images make them think of? How does getting lost make you feel? Why is that? What might help them when walking through the wilderness?

Learning Objectives:

- Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups
- Apply understanding of computing to program, monitor and control their products
- Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design
- 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
- Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work

Overview:

Lesson 1: Navigating the world - To write a design brief and criteria based on a client request

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

Lesson 3: Product concept – To develop a sustainable product concept

Lesson 4: 3D CAD models – To develop 3D CAD skills to produce a virtual model

Lesson 5: Product pitch – To present a pitch to 'sell' the product to a specified client

Cross Curricular Links

English – Retrieve, record and present information from non-fiction

Computing – Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

Resources

• Activity: Aria's letter – one per pupil • Activity: DIY Design brief (fill-the-gap) and criteria – for pupils requiring additional support • Childrens' design criteria from 'Lesson 1: Navigating the world' • tablets to access the BBC Micro:bit editor through an internet browserI• If using tablets you will need the BBC Micro:bit app • Link: 'Micro: bit Make Code editor' – this can be accessed via an internet browser such as Google Chrome or Safari or as an app on the Google Play or Apple store. • Link: 'Tinkercad' • Link: 'The Tinkercad remix project' – for pupils needing extra support

Impact/Assessment

Most Children will: • Highlighting key information that directly describes the request such as 'multifunctional' and 'compact', with a simple explanation for selecting them. •Writing a program that displays an arrow to indicate cardinal compass directions 'North', 'East', 'South' and 'West', with an 'On start' loading screen. Can suggest where there are errors (bugs) in the code and ways to fix (debug) them by comparing their program to a finished example or by retracing steps.• Explaining key industries that use 3D CAD modelling and why •Completing a product pitch plan that includes key information (such as functions of the program, materials chosen) drawn from the rest of the project (unit link).

More Able Children will: • Highlighting key information that directly and indirectly lends itself to a design solution, such as 'outdoor equipment' and justifying their selections with a detailed explanation 'the product will need to be durable and waterproof'. •Writing a program that displays an arrow to indicate cardinal compass directions 'North', 'East', 'South' and 'West', with an 'On start' loading screen. Can suggest where there are errors (bugs) in the code and ways to fix (debug) them by comparing their program to a finished example or by retracing steps. .• Recalling and describing the name and use of key tools used in Tinkercad (CAD) software. • Completing a detailed product pitch plan that includes key information (such as functions of the program, materials chosen) drawn from the rest of the project (unit link).