# Brough Primary School – Curriculum Intention Plan 2023 - 2024

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| **Subject:** Computing<br>**Year Group:** Year 5/6 | | **Area of learning: 3D Modelling (NCCE Y6)** |
| Links to previous work/Remember when | You will need an understanding of the properties of 2D and 3D shapes, such as those specified in the Mathematics National Curriculum for KS1 and KS2. | |
| **Term** | **Year 5/6** | **Key Skills to be taught** |
| **Summer 1 2024 (Cycle B)**<br><br>What the children should know at the end of this series of lessons | | Learners will develop their knowledge and understanding of using a computer to produce 3D models. Learners will initially familiarise themselves with working in a 3D space, moving, resizing, and duplicating objects. They will then create hollow objects using placeholders and combine multiple objects to create a model of a desk tidy. Finally, learners will examine the benefits of grouping and ungrouping 3D objects, then go on to plan, develop, and evaluate their own 3D model of a building. |

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| **Vocabulary**<br>2D, 3D, shapes, select, move, perspective, view, rotate, duplicate, group, cylinder, placeholder, hollow, choose, combine, construct, evaluate, modify |

| Sequence of learning | Learning Objectives/Outcomes | suggested Lesson Outline |
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| 1 | **Learning Objective:**<br>To recognise that you can work in three dimensions on a computer<br><br>**Key Knowledge:**<br>I can add 3D shapes to a project<br><br>I can view 3D shapes from different perspectives | **Recap** – Check learners' understanding of the term '3D' and the difference between 2D and 3D shapes. Build the slide to show that 2D shapes are flat and have no depth. 3D shapes have height, width, and depth.<br><br>Learners will be introduced to the concept of 3D modelling by creating a range of 3D shapes that they select and move. Learners also examine shapes from a variety of views within the 3D space.<br><br>See NCCE L1 Lesson Plan |

# Brough Primary School – Curriculum Intention Plan 2023 - 2024

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| | I can move 3D shapes relative to one another | |
| 2 | **Learning Objective:** To identify that digital 3D objects can be modified<br><br>**Key Knowledge:**<br><br>I can resize an object in three dimensions<br><br>I can lift/lower 3D objects<br><br>I can recolour a 3D object | **Recap** – Remind learners that in the previous lesson they worked with 3D shapes in Tinkercad, moving them in two dimensions on the workplane.Build the slide to reveal that in this lesson, they will work in three dimensions by lifting and lowering objects, and modifying their size, including their height.<br><br>Learners will manipulate 3D objects digitally. They will resize objects in one, two, and three dimensions. They will also lift and lower 3D objects relative to the workplane and combine two 3D objects to make a new shape. Finally, learners will recolour 3D objects.<br><br>See NCCE L2 Lesson Plan |
| 3 | **Learning Objective:** To recognise that objects can be combined in a 3D model<br><br>**Key Knowledge:**<br><br>I can rotate objects in three dimensions<br><br>I can duplicate 3D objects<br><br>I can group 3D objects | **Recap** – Explain that in this lesson, learners will experiment with more types of shapes and more ways of moving them. Tell learners that in addition to shapes, they can also add text and draw objects freehand. Ask learners if they can identify which shape on slide 3 is hand-drawn. After a brief discussion, reveal that the '@' sign is hand-drawn.<br><br>Learners will develop their understanding of manipulating digital 3D objects. They will rotate objects in three dimensions, duplicate objects, and then use grouping and ungrouping to manipulate many objects at once. They will combine these skills to create their own 3D name badge. Finally, learners will consider the practicality of 3D printing the objects they have made.<br><br>See NCCE L3 Lesson Plan |

# Brough Primary School – Curriculum Intention Plan 2023 - 2024

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| 4 | **Learning Objective:**<br>To create a 3D model for a given purpose<br><br>**Key Knowledge:**<br>I can accurately size 3D objects<br><br>I can show that placeholders can create holes in 3D objects<br><br>I can combine a number of 3D objects | **Recap** – Show the image of a 3D printed desk tidy on slide 3. Tell learners that they will be making their own version of a desk tidy, digitally. Ask learners what 3D modelling techniques they think have been used to make this model. Learners should identify that cylinders have been placed, duplicated, moved, and resized.<br><br>Learners will be introduced to the dimensions of shapes in Tinkercad which will enable them to accurately resize and move shapes. Learners will then be introduced to placeholders which can be used to create holes in objects. Finally learners will duplicate, then resize multiple objects to create a meaningful 3D object.<br><br>See NCCE L4 Lesson Plan |
| 5 | **Learning Objective:**<br>To plan my own 3D model<br><br>**Key Knowledge:**<br><br>I can analyse a 3D model<br><br>I can choose objects to use in a 3D model<br><br>I can combine objects in a design | **Recap** – Show slide 3, explain that 3D design is used by architects to design buildings. Ask learners why they think computer based 3D design is useful in architecture. Learners should be able to draw on their experiences of 3D design in the unit so far to identify some of the following:Designs can be viewed from different perspectives. Objects can be easily duplicated, moved, and resized. Explain that in this lesson, learners will be planning their own building design which they will create in Tinkercad.<br><br>Learners will see how computer-based 3D design is used in architecture to plan buildings. They will explode 3D models of buildings to see what shapes they comprise of. Learners will then look at real world structures and identify the shapes that they include. They will then plan their own 3D building design.<br><br>See NCCE L5 Lesson Plan |

# Brough Primary School – Curriculum Intention Plan 2023 - 2024

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| 6 | **Learning Objective:**<br>To create my own digital 3D model<br><br>**Key Knowledge:**<br><br>I can construct a 3D model based on a design<br><br>I can explain how my 3D model could be improved<br><br>I can modify my 3D model to improve it | **Recap -** Show slide 3. Ask learners to consider which 3D modelling techniques they will need to turn their design into a reality. If necessary, prompt learners by reminding them of some of the techniques they have been introduced to in this unit, including moving, resizing, lifting/lowering, duplicating, and grouping/ungrouping.<br><br>Learners will create a computer 3D model based on their design. They will then evaluate their model and that of another learner, before modifying their own model to improve it.<br><br>See NCCE L6 Lesson Plan |

| **Learning Outcome/product** |
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| Describe the purpose of their project: to create a 3D model of a building.<br><br>Explain shapes that are representative of a real-world object to make a model.<br><br>Recognise that changing perspective does not change the position of objects.<br><br>Position 3D objects to create a chosen artefact.<br><br>Accurately resize objects.<br><br>Create holes in objects.<br><br>Use and combine variations of one 3D shape.<br><br>Evaluate how successful they were in meeting the task requirements. |

| **Assessment records** | **List only those children who have not achieved the expected outcomes.** |
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