Medium Term Plan: Supporting Implementation of LTP/Progression Grid

Subject: DT - CAMs Year: B (UKS2)

NC/PoS:

- 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
- 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 tools and equipment to perform practical tasks 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 and analyse a range of existing products
- Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- Understand and use mechanical systems in their products

Prior Learning (what pupils already know and can do)

- Children know how to design a mechanical system that is appealing and can explain the user and purpose.
- Children know how to discuss different ways that objects move – wheels, axles, levers, linkages, sliders, pneumatics, hydraulics (pulleys and gears if completed in year 6)
- Children know how to draw an annotated sketch of a mechanical system and can label it with materials and equipment.
- Children know how to make prototypes
- Children know how to select from a variety of materials and use a range of joining techniques using glue, split pins, elastic bands.
- Children know how to name real items that use mechanical systems.
- Children know if their moving product is appealing and suitable for the intended user and purpose. They can listen to other' views and can offer a way to improve their product.
- Children know how to use mechanisms in their products.
- Children know how to make free standing and shell structures (and frame structures of completed in year 6) and know how to strengthen and stiffen their structures.

End points (what pupils MUST know and remember)

- Children know how to use research and develop design criteria to inform the design of innovative, functional, appealing children's toys
- Children know how to generate, develop, model and communicate their ideas through discussion, annotated sketches and exploded diagrams.
- Children know how to select from and use a wider range of tools and equipment to perform practical tasks accurately – wood, glue, glue gun, cardboard, scissors,
- Children know how to select from and use a wider range of materials and components, including construction materials, according to their functional properties and aesthetic qualities
- Children know how to investigate and analyse a range of existing products
- Children know how to evaluate their ideas and products against their own design criteria

and consider the views of others to improve their work - Children know how to apply their understanding of how to strengthen, stiffen and reinforce more complex structures - Children know how to understand and use mechanical systems in their products.
Key Vocabulary CAMs, rotary, oscillating, reciprocating, input movement, process and output movement, centre, off centre
Session 1: Evaluating existing products - Discuss with the children different types of movement: rotary, oscillating and reciprocating. - Explore a variety of toys which use CAMs to make the various types of movement. Use videos, photographs and computer animations of products that cannot be explored through first-hand experience. - Discuss: How innovative is the product? What design decisions have been made? What type of movement can be seen? What types of mechanical components are used and where are they positioned? What are the input movement, process and output movement of the system? How well does the product work? Why have the materials and components been chosen? How well has it been designed? How well has it been made? Vocab: CAMs, rotary, oscillating, reciprocating, input movement, process and output movement
Session 2: Practising skills - Give children pre-cut cams made from MDF or wooden wheels to mount on a piece of board and observe their movement with a follower. - Consider the CAMs, how do they move? Is the hole centre or off centre? What is the input/output movement? Vocab: CAMs, centre, off centre, input movement, process and output movement
Session 3: Designing - Develop a design brief with the children. - Children generate innovative ideas by carrying out research including surveys, interviews and questionnaires and develop a design specification for their product, carefully considering the purpose and intended user for their product. - Communicate ideas through detailed, annotated sketches and exploded diagrams. The drawings should indicate the design decisions made, including the location of the components, how they work as a system and the appearance and finishing techniques for the product to ensure it is appealing. - Produce detailed step-by-step plans and lists of tools, equipment and materials needed. - Innovation: Have you considered how to make the project different and better than others of the same kind? - Individual liberty – children are encouraged to make their products different and unique. Vocab: CAMS, input movement, process and output movement
Session 4: Making - DT consultant to supply expertise and high-quality resources for this unit of work - Develop measuring, marking, cutting, shaping and joining skills using junior hacksaws, square section wood and card triangles to make cam mechanisms and construct wooden frames or card housings, as appropriate. Demonstrate the accurate and safe use of tools and equipment.

- Make a high-quality toy with CAMs applying knowledge, understanding and skills from earlier sessions.
- Children should consider the movement and evaluate as they make to ensure they follow the plan
- Children should use a range of decorative finishing techniques to ensure a well finished final product that matches the intended user and purpose.
- Resilience – during the entire making process, we discuss keeping on trying and never giving up even if the task gets tricky.

Vocab: CAMS, input movement, process and output movement

Session 5:
Evaluating

- Evaluate throughout and the final product in use, comparing it to the original design specification. Is the movement as planned? Are the wholes of the CAMs centre or off centre?
- Critically evaluate the quality of the design, the manufacture, functionality, innovation shown and fitness for the intended user and purpose
- Functionality: Does the product work for the intended purpose? Does it move effectively? Is the product appealing to the eye?
- Honesty – during the evaluation stages discuss being honest with ourselves (self-reflection) and others to ensure we can improve ourselves and our work.

Vocab: CAMs, rotary, oscillating, reciprocating, input movement, process and output movement

Future learning this content supports:
UKS2 – Framed structures (if completed in year 5)
KS3 - woodwork