Medium Term Plan: Supporting Implementation of LTP/Progression Grid

Subject: DT - Electrical systems – Simple circuits and switches.   Year: A – Spring (LKS2)
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.
- To generate, develop, model and communicate their ideas through discussion, annotated sketches and cross-sectional.
- Select from and use a wider range of materials and components 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.
- To understand and use electrical systems in their products.

Prior Learning (what pupils already know and can do)
- Children know how to design a structure using a cube or cuboid shaped shell and can explain the user and purpose.
- Children know how to draw an annotated sketch of a shell structure and can label it with materials and strengthening solutions.
- Children know how to make a prototype of a shell structure using paper to practise joining techniques and strengthening solutions (laminating, ribbing, corrugating)
- Children know how to select from PVA glue, glue sticks and scissors to cut and join materials (card and cardboard). They can use card or paper straws to strengthen their structure.
- Children know if their structure is suitable for the intended user and purpose. They can offer a way to improve their structure.
- Children know how to strengthen a structure using ribbing, corrugating or laminating and explain what this means.

End points (what pupils MUST know and remember)
- Children know how to design an electrical circuit for a product. For example: a torch
- Children know how to draw an annotated sketch of an electrical circuit and can label it with materials and components.
- Children know how to select from batteries, switches, foil, paper clips, buzzers, bulbs to create their product.
- Children know how to name products that use electrical circuits – lights, torches, children's toys.
- Children know how to state if their electrical circuit and final product is suitable for the intended user and purpose. They can offer a way to improve their product.
- Children know how to understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers.

Key Vocabulary
series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, insulator, conductor, crocodile clip

Session 1:
Evaluating existing products
- Evaluate a range of pre-existing battery-operated items e.g. Xmas lights, torch, toothbrush, toys, remote control.
- Disassemble some of the items to see what they look like inside, particularly focusing on the

circuit.
- Look at the insides of torches and consider what all torches have.
- Look at the user of different torches, are they for a child with a safety strap and light weight. Are they for industrial workers, heavy weight with increased brightness etc.

Vocab: circuit

Session 2:
Practise skills

- Children make simple circuits and use the commercial made switches (Push-to-break switch, Push-to-make switch and Toggle switch)
- Explore what happens when the circuit is broken or rearranged. Work on debugging circuits that aren't working.
- Use bulbs, crocodile clips, and battery packs (science link)
- Make a variety of switches by using simple classroom materials e.g. card, corrugated plastic, aluminium foil, paper fasteners and paper clips. Make switches that operate in different ways e.g. when you press them, when you turn them, when you push them from side to side. Test switches in a simple series circuit.

Vocab: series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, insulator, conductor, crocodile clip

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Session 3:
Designing
- Gather information about needs and wants and develop design criteria to inform the design of products that are fit for purpose, aimed at particular individuals or groups (Torch)
- Generate, develop, model and communicate realistic ideas through discussion and, as appropriate, annotated sketches and cross-sectional diagrams.
- Annotated sketches to show external shape. Cross sectional diagram to show internal and external components.
- Individual liberty – children are encouraged to make their products different and unique.

Vocab: series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, insulator, conductor, crocodile clip

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Session 4:
Making - DT consultant to supply high quality materials and support for this session.
- Select from and use tools and equipment to cut, shape, join, and finish with some accuracy.
- Select from and use materials and components, including construction materials and electrical components according to their functional properties and aesthetic qualities (bulb/buzzer, wires, battery, container shape/size)
- Resilience – during the entire making process, we discuss keeping on trying and never giving up even if the task gets tricky.

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Session 5:
Evaluating
- Evaluate their ideas and products against their own design criteria and identify the strengths and areas for improvement in their work (include user and purpose across evaluation – what is effective to your audience? Would they buy this product? Why? If not, how could you improve it?

- Predict what could happen with additional batteries
- Honesty – during the evaluation stages we discuss being honest with ourselves (self-reflection) and others to ensure we can improve ourselves and our work.

Vocab: evaluate

Future learning this content supports:
UKS2 - Electrical Systems - More Complex Switches and Circuits