Electrical Systems & ICT

Textiles

(Updated September 2023)

EYFS	KS1	LKS2	UKS2
N/A	**N/A**	**Substantive Knowledge** * Understand that a simple circuit contains a battery, lightbulb and wires. * Understand that a switch can be added to manually control an electrical product. * Understand that electrical products can be controlled by ICT. * Understand how to program a sequence of changing LED lights using ICT. * Understand and use key vocabulary (see below). **Disciplinary Knowledge** * Explore existing illuminated signs and LED light sequences. * Respond to the work and influence of Garret Morgan. **Key Skills** * Develop vocabulary related to the project. * Incorporate a circuit into a model. * Use electrical systems such as switches, bulbs and buzzers. * Use ICT to control products.	**As LKS2 plus:** **Mechanical and Electrical Systems (Fairground Rides and Billboards)** **Substantive Knowledge** * Understand that pulleys, gears and motors help to rotate and move the components of fairground rides. * Understand that motors can be programmed using ICT to to move at a certain speed, intensity. * Understand the benefits of a multi-functional navigational tool. * Understand how Microbits (as an example of an electrical device) can be programmed using a series of steps/code. * Understand and use key vocabulary (see below). **Disciplinary Knowledge** * Explore existing fairground rides and the mechanisms/electrical components. * Respond to the work and influence of Julia Barfield and David Marks. **Key Skills** * Develop a technical vocabulary appropriate to the project. * Use mechanical systems such as pulleys and gears. * Use electrical systems such as motors. * Program, monitor and control using ICT.
		Design • Use CAD where appropriate. • Consider aesthetic qualities of materials chosen. **Make** • Plan the stages of the making process. **Evaluate** • Investigate similar products to the one to be made to give starting points for a design. • Consider and explain how the finished product could be improved. • Discuss how well the finished product meets the design criteria of the user. • Investigate key individuals in Design and Technology.	**Design** • Plan the sequence of work e.g. using a storyboard. **Make** • Plan the stages of the making process. **Evaluate** • Research and evaluate existing products (including book and web-based research). • Consider user and purpose. • Discuss how well the finished product meets the design criteria of the user. Test on the user
		Key Vocabulary Circuit, battery, wires, lightbulb, switches, buzzers, electrical product, ICT, sequence, LED lights, illuminated, code	**Fairground Rides Key Vocabulary** **LKS2 plus:** pulleys, gears, motors, program, components **Billboards (Microbits) Key Vocabulary** **LKS2 plus:** Microbits, multi-functional, function, device, program
		Year 4 - Autumn 2 **Circus, Circus** **Design and create an illuminated sign for the fairground using simple circuits and switches. Understand that electronic products can be controlled by ICT and program a sequence for LED fairy lights.** 	**Year 6 - Autumn 1&2** **Darkness and Light/The Golden Age** **Design and make mini fairground rides using pulleys, gears and motors.**  **Program a multi-functional navigational tool (Microbits) which could be used as a billboard advertising messages for the Winter Wonderland.** 

Mechanical and Electrical Systems & ICT

EYFS - N/A

KS1 - N/A

LKS2 - Children will **investigate how lights work** and some different, more **sustainable options** such as LEDs. They will **construct a working circuit with one or more lights** to fit in a decorative illuminated sign fit for a circus. They will investigate ways in which **computers can be used to program and control lights** using real LED lights and/or computer-aided design.

UKS2 - Children will **explore the history of the fairground, exploring existing rides and how they move**. They will **use motors to create rotating parts** and create **prototype models** to ensure stable frameworks. Children will **use a variety of materials** to create their final moving ride as part of a **collaborative 'Winter Wonderland' before evaluating**. Children will **build on their knowledge of how to program Microbits** in order to design and create 'billboards' advertising popular brands, displaying messages etc. to be placed around the 'Winter Wonderland'.