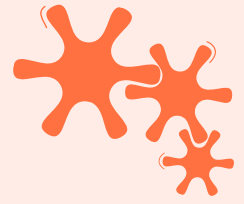


Spirit of Innovation

STEAM Resources



Engineering

Year Five

Circuits

Motion and Lights

Links

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].

When designing and making, pupils should be taught to:

Design

- 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

Make

- Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], 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

Evaluate

- 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
- Understand how key events and individuals in design and technology have helped shape the world

Technical knowledge

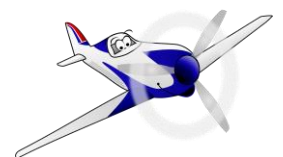
- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- Understand and use mechanical systems in their products
- Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]

Resources

- Recycled material
- Scissors
- Glue
- Sticky tape
- Glue Gun
- Split pins
- Lolly sticks
- Cardboard
- Paper
- Drinking straws
- Wooden wheels
- String
- Hole punch
- Dowel
- Scissors
- Pens
- Paint
- Hole punch
- Wires
- Bulbs
- Batteries
- Motors
- Construction kits
- Solar panels (optional)



PIONEERS OF POWER



Skills

- Working as a pair
- Working as an individual
- Communicating thoughts and ideas
- Predicting outcomes
- Selecting suitable tools and materials
- Understanding circuits
- Demonstrate and range of joining techniques
- Improving and evaluating designs

Questions

- What materials are you going to use?
- What tools will you require? Why?
- What will you use to join each material? Why?

Activity

Activity One

Pairs

(40 - 60mins x2)

Pupils should be asked to design a moving model based on The Spirit of Innovation Project.

In keeping with the Spirit of Innovation Project the main body of the plane needs to be created out of recycled materials. Construction kits could also be used.

The plane must include at least **one** moving part; operated via cogs or a motor, plus be designed to have working lights.

Using the Blueprint Design Sheet ([Download](#)) pupils need to design and label their plane. Communicate their ideas through group discussions, annotated sketches, cross-sectional and exploded diagrams. Pupils should also list the materials required for their build and clearly present the workings of moving parts and the circuitry.

Once a design has been agreed and resources gathered, the plane can begin to be constructed.

During the creating stage pupils should ensure that they are evaluating their joining technique. Concentrating on strengthening, stiffening and reinforcing their more complex structures.

Throughout these two sessions pupils should be given time to evaluate theirs and other models, using this knowledge they will be able to make adjustments to improve their own work.

**Solar panels to power the lights or moving parts suggested but optional*



PIONEERS OF POWER

