



The **BIG** Picture

The use of tools and machines is an everyday necessity, and the beginnings of such life-skills can happen in school. Here the children continue their understanding of using and creating mechanisms to aid and control movement; in this car a model car.

What do we already know? What can we already do?

The children engage in a design and make mechanism project, Moving Monsters, in Year 2. They make linkages using card for levers and split pins for pivots.

Key vocabulary & understanding:

chassis
energy
kinetic
mechanism
air resistance
design
structure
graphics
research
model
template

NC Objectives- Key Stage

Pupils should be taught:

- * 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 group.
- * 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 [for example, cutting, shaping, joining and finishing], accurately.
- * Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics.
- * 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
- * Understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]

Key Questions

- What is a mechanism?
- What is an exploded diagram?
- What do we mean by graphics?
- Explain air-resistance.

Specific unit outcomes

Work independently to produce an accurate, functioning car chassis.
Design a shape that is suitable for the project.
Attempt to reduce air resistance through the design of the shape.
Produce panels that will fit the chassis and can be assembled effectively using the tabs they have designed.
Construct car bodies effectively.
Conduct a trial accurately and draw conclusions and improvements from the results.

Key Skills

Designing a shape that reduces air resistance.
Drawing a net to create a structure from.
Choosing shapes that increase or decrease speed as a result of air resistance.
Personalising a design.
Measuring, marking, cutting and assembling with increasing accuracy.
Making a model based on a chosen design.
Evaluating the speed of a final product based on: the effect of shape on speed and the accuracy of workmanship on performance.

Key Knowledge

To understand that all moving things have kinetic energy.
To understand that kinetic energy is the energy that something (object/person) has by being in motion.
To know that air resistance is the level of drag on an object as it is forced through the air.
To understand that the shape of a moving object will affect how it moves due to air resistance.





The BIG Picture

Our children have learnt about making aesthetically pleasing products in textiles and now they consider purpose and problem solving as they apply their creativity to making a fabric book-cover.

What do we already know? What can we already do?

The children are building on their learning and skills development when making cushions in Year 3. Then they learnt cross-stitch and appliqué in order to create an appealing product.

Key vocabulary & understanding:

Aesthetic assemble book sleeve design criteria evaluation fabric fastening prototype net running-stitch stencil target audience target customer template

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- * Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics.
- * 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.

Specific unit outcomes

- Identify the features, benefits and disadvantages of a range of fastening types.
- Write design criteria and design a sleeve that satisfies the criteria.
- Make a template for their book sleeve.
- Assemble their case using any stitch they are comfortable with.

Key Skills

- Writing design criteria for a product, articulating decisions made.
- Designing a personalised book sleeve.
- Making and testing a paper template with accuracy and in keeping with the design criteria.
- Measuring, marking and cutting fabric using a paper template.
- Selecting a stitch style to join fabric.
- Sewing neatly using small regular stitches.
- Incorporating a fastening to a design.
- Testing and evaluating an end product against the original design criteria.

Key Knowledge

- To know that a fastening is something that holds two pieces of material together.
- To know that different fastening types are useful for different purposes.
- To know that creating a mock-up (prototype) of their design is useful for checking ideas and proportions.



Key Questions

- What is a fastening?
- What is a toggle?
- What is fabric?
- What is the purpose of a prototype?

Links with computing:

Taking photographs of fastenings they find.



The **BIG** Picture

This exciting brings electricity to life to our children who are amazed at their electric powered creations. In tandem with science learning on light, they harness the reflective and conductive properties of foil to create working torches with switches.

What do we already know? What can we already do?

This is the first electrical systems units taught to our children in DT. Our learning builds on Year 3's science learning of light, how it travels and how we see things

Key vocabulary & understanding:

battery bulb
buzzer conductor
circuit circuit diagram
electricity insulator
series circuit switch
component design
design criteria
diagram
evaluation LED
model shape
target audience
Input recyclable
theme aesthetics
assemble equipment
Ingredients packaging

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- * 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 [for example, cutting, shaping, joining and finishing], accurately.
- * Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics.
- * 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
- * Understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]

Specific unit outcomes

- Identify electrical products and explain why they are useful.
- Help to make a working switch.
- Identify the features of a torch and how it works.
- Describe what makes a torch successful.
- Create suitable designs that fit the success criteria and their own design criteria.
- Create a functioning torch with a switch according to their design criteria.

Key Questions

- What is electricity?
- What is a conductor?
- What is an insulator?
- What is dangerous about this situation?

Key Skills

- Designing a torch, giving consideration to the target audience and creating both design and success criteria focusing on features of individual design ideas.
- Making a torch with a working electrical circuit and switch.
- Using appropriate equipment to cut and attach materials.
- Assembling a torch according to the design and success criteria.
- Evaluating electrical products.
- Testing and evaluating the success of a final product.

Key Knowledge

- To understand that electrical conductors are materials which electricity can pass through.
- To understand that electrical insulators are materials which electricity cannot pass through.
- To know that a battery contains stored electricity that can be used to power products.
- To know that an electrical circuit must be complete for electricity to flow.
- To know that a switch can be used to complete and break an electrical circuit.

