Year 1 Autumn Term

Concept

Sliders

How can pictures move?

mechanisms

joining and assembling

Connect

Explain

Example

Attempt

Apply

Connect

- Different media can be combined for a purpose.
- Words like join, build, shape, longer, shorter, heavier are used to describe how items are made.
- Paper and card can be used to make simple flaps & hinges.
- Materials can be cut, shaped and joined using sticky tape, glue, scissors and string, or by folding.

- Sliders can make a picture move.
- Some materials are more suitable than others for a job.
- Tools can be used to mark, cut out and fix parts together.
- It is important to be able to use tools accurately.
- It is important to use finishing materials to make a product look good.
- Annie Atkins is a graphic designer in TV and film.

Practise using scissors to cut straight and curvy lines.

Explore different sliders to make an object move.

Look at a range of Christmas cards and their designs. Discuss likes and dislikes.

Make a Christmas card with a moving part.

Pictures can have moving parts.

My developed cutting skills will be used in the wider curriculum.

In Year 2, I will be learning about other mechanisms that can be used to make a moving part.

Vocabulary

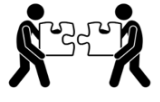
- **Mechanism** – a device used to create movement.
- **Slider** – a rigid bar which moves backwards and forwards along a straight line.
- **Guide or bridge** - a short card strip used to keep sliders in place and control movement.

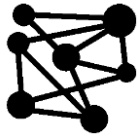
Year 2 Autumn Term

Levers, pivots and linkages

How do pictures move with levers, pivots and linkages?

Concept





Connect

Pictures can have moving parts.

It is important to be able to hold and use scissors to cut with accuracy along a straight line.

Explain

- Levers, pivots and linkages can make a picture move and are created by measuring, marking out, cutting and joining materials and components using different tools and techniques.
- It is important to follow the line accurately with scissors when cutting out.
- It is important to be able to use a wider range of tools safely and correctly.
- A product is made by following a design criteria and steps.
- It is important to use finishing materials to make a product look good.
- Margaret Calvert is a designer who created road traffic signage.

Example

Attempt

Practise using scissors to cut shapes with straight sides, and to cut along curved lines, by knowing how to turn the paper or card while cutting.

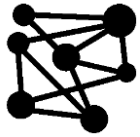
Learn how to make a hole in card using a sharp pencil and sticky tac.

Explore different levers, pivots and linkages to make an object move.

Look at a set of design criteria and have support to follow each step.

Apply

Make a waving Santa card.



Connect

In Year 3, I will make a moving vehicle where I will need to decide how to measure, mark, cut out and join materials to create the finished product. I will create my own design criteria.

Vocabulary

Linkage - a system of links that are joined together to change movement.

Pivot - central point on which a mechanism turns.

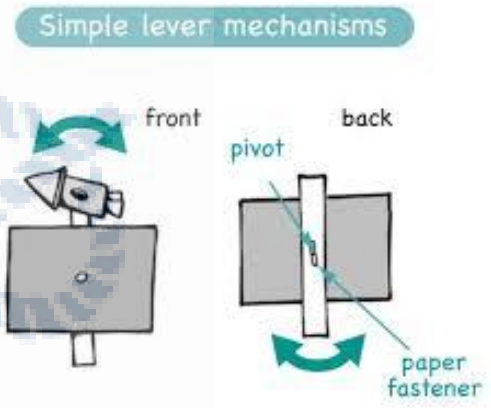
Guide/bridge - short card strip used to keep sliders in place and control movement.

Mechanism - device used to create movement in a product.

Lever - a rigid bar which moves around a pivot.

Slider – a rigid bar which moves backwards and forwards along a straight line.

Unlike a lever, a slider does not have a pivot point

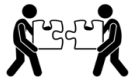


Year 3 Autumn Term

Moving parts – wheels and axles

Can I create a moving car?

Concept



Connect

It is important to use scissors to cut accurately along a straight or curved line, knowing how to turn the card while cutting.

Components can be joined in different ways.

Holes can be made in card by pushing a pencil through onto sticky tack.

It is important to have design criteria to follow to make the product.

It is important to use finishing materials to make a product look good.

Explain

- It is important to know how to draw accurately-labelled diagrams and sketches, and how to use our own words, to describe our own design.
- Making good design decisions will lead to the best outcomes.
- It is important to know how to assemble, join and combine materials and components with good accuracy.
- Wheels on a car move at the same time and speed because each pair of wheels is attached to a pole called an axle.

Example

Attempt

- Learn how to align holes on both sides of a chassis by using a ruler and measuring, so that the axle is straight.
- Investigate how to secure wheels to an axle to stop them sliding about or falling off.
- Learn how to generate our own design criteria – in words, diagrams and labels.
- Alec Issigonis was a British car designer who created the mini.

Apply

Make a moving car.

Connect

- In Year 4, I will make a child's nightlight where I will need to know that materials can be shaped using cutting tools so it is important to be able to cut accurately. It will be important to know how to assemble, join and combine materials and components with good accuracy, how to follow my own design criteria, and how to use finishing techniques to make my product look good.

Vocabulary

Axle - a rod or spindle passing through the centre of a wheel

Wheel - a circular object that revolves on an axle and fixed below a vehicle to enable it to move along the ground

Measure - to find the size or amount

Chassis - the frame that supports all parts of a car

Year 4 Autumn Term

Simple Circuits

How can we make a child's nightlight?

Concept

electrical systems

joining and assembling

Connect

Explain

Example

Attempt

Apply

Connect

- There are ways to make structures stiffer & more stable as I work.
- Products should be tested and adjustments made to improve their strength and effectiveness.
- Materials need to be joined accurately.
- Design plans have steps that need to be followed.
- Ideas can be developed by researching online.

- Designers can make useful products that include electrical components.
- An electrical circuit is a loop through which an electrical current can flow.
- Simple series circuits can be built, which incorporate a switch and a bulb.
- Computers can help us to design products.
- It is important to be able to measure accurately.
- It is important to use strengthen materials and there are many ways to do this.
- It is sometimes necessary to cut out sections of materials within the perimeter and not from the edge,
- Thomas Edison was a famous inventor. He invented the lightbulb.

Look at examples of nightlights.

Consider audience in the design.

Explore what is meant by a circuit.

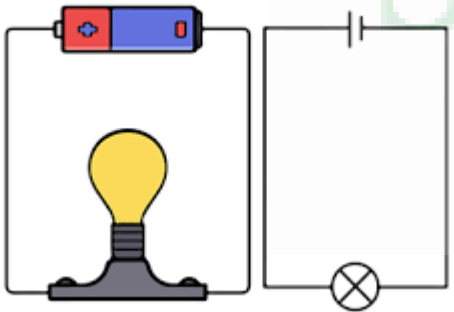
Practise joining wires to the bulbs.

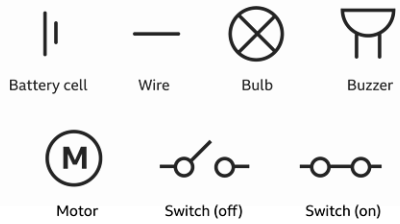
Use a computer design program to create a case.

Practise creating holes and slits in the middle of the casing and not just on the edge. This hole will allow the light to be seen, e.g. the windows in a car.

Make a nightlight using a simple circuit and a computer designed casing.

In Year 6 , I will create more complex circuits.





Vocabulary

· casing – a cover or shell that protects or encloses something
· net – a 2D pattern that can be folded to form a 3D object
· scoring - indenting a material to make it easier to fold
· shelf-appeal – how attractive a product is to look at
· circuit - A circuit is a closed loop or path that allows electricity to flow, typically from a power source like a battery
· switch - A switch is a device that either opens or closes an electrical circuit to turn a device on or off
· bulb - a device used to convert electricity into light

Year 5 Autumn Term

Using a simple mechanism

Can I design and make a cam toy?

Concept

electrical systems

joining and assembling

Connect

- Knowledge of existing products can be used to produce ideas, explain what I am making and why it fits the purpose.
- Materials are suited to different tasks and these can be joined in different ways.
- Products can be designed using diagrams, models, words and ICT.
- I can measure, mark out, cut and shape materials and components, with support.
- I can use finishing techniques on my product.

Explain

- Cams can be used to create a moving part in a moving toy.
- Measurements are often needed in a design.
- It is important to measure and cut accurately.
- It is important to score and fold paper or card accurately.
- There are a range of ways to join materials together and often one way is better than another.
- It is important to test a product as it is being made, making adjustments to fit the design criteria.
- Products should be evaluated in line with the design criteria and strengthened where necessary.

Example

Attempt

Explore toys with simple moving parts.

Watch videos showing simple cam mechanisms.

Experiment with using different cams and their effects on the moving part.

Design the toy with an audience in mind.

Apply

Make a toy with a moving part, using a cam mechanism.

Connect

Toys can have moving parts and cam mechanisms can be used to help these parts move.

In Year 6 , I will make a light-up card.

Vocabulary

Cam (ellipse, eccentric, hexagon, snail, oval, round)

Industrial design

Mechanical systems - a group of moving parts that work together to perform a task through a series of interconnected movements and forces

Mechanism - a system of parts working together in a machine; a piece of machinery

Slider – a knob or lever that is moved horizontally or vertically to control a variable, such as the volume of a radio.

Follower - A follower mechanism is a system with two main parts: a rotating cam and a follower that moves in response to the cam's shape

Year 6 Autumn Term

Concept

electrical systems

More Complex Circuits

Can I create a Christmas card which lights up?

Connect

-Simple series circuits can be built, which incorporate a power source a switch and a bulb.

- Designers can make useful products that include electrical components.

Explain

- Ideas can be communicated through circuit diagrams and annotated sketches.
- Computer control programs can be used to enable electrical products to work automatically in response to changes in the environment, e.g. a light turning on when it is dark or the heater turning on when the temperature drops below a point.
- Parallel circuits are ones in which components are on separate branches
- Materials can be shaped using cutting tools and it is important to be able to cut accurately.

Example

Attempt

-Explore the science behind a circuit and the terminology involved.

-Experiment with different circuits.

-Research different light-up cards.

-Draw a detailed labelled sketch of the light up card with design criteria.

-Design the card with an audience in mind.

Apply

Create a Christmas card which lights up when the card is opened or a switch is pressed.

Connect

Some cards can light up or sing when opened using an electrical circuit.

Electrical circuits can be used in the design of products.

In KS3, I will use a variety of approaches (for example, biomimicry and user-centred design) to generate creative ideas and avoid stereotypical responses.

I will develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools.

Vocabulary

circuit - a closed loop or path that allows electricity to flow, typically from a power source like a battery switch

switch - a device that either opens or closes an electrical circuit to turn a device on or off

bulb - a device used to convert electricity into light

power source – provides the power in an electrical circuit, e.g. a battery. The flow of electricity flows from the positive to negative terminal.

component – anything in a circuit, e.g.

electrical conductor – a material that allows electricity to flow through it

parallel circuit – ones in which components are on separate branches