

EYFS

Design and Technology

Making a moving birds nest

key learning

Understand the impact of chopping down trees in country parks.

Research & explore different pneumatic systems.

Design a moving a bird nest.

Select the tools and equipment needed to make our design.

Make a moving bird nest.

Evaluate my final product.

Design Brief

Design and make a nest with moving birds in it to show the council that they cannot chop the trees down in St George's Park.

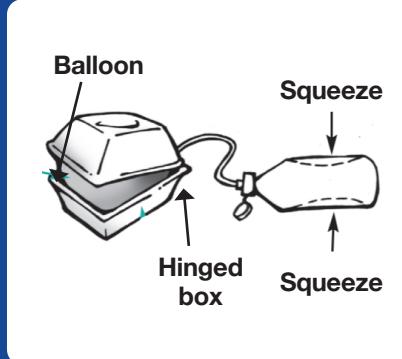
Existing Products



This boy is pumping up a balloon with a hand pump.



This toy pumps balloons to power the toys cars.



This is a labelled diagram of how we could use the pneumatic system in our own design.

key skills and related vocabulary:

Pneumatic - A system that pumps air

Research - Explore how other people have done things

Design - To think up or plan what you want to make by drawing it

Make - Create something by putting parts together

Evaluate - Making a judgement about how good or bad the thing is that you made

Health and Safety

- Walk safely and calmly around the classroom
- Keep your work and floor area clear
- Follow all instructions
- Shows understanding of how to transport and store scissors safely
- Store equipment safely
- Report all spillages and clean up properly

Year 1

key learning

Receive the Design Criteria.

Understand climate change and how country parks and woodlands can help combat climate change.

Design and Technology

Make a moving picture book

Our Changing Planet

Explore and evaluate existing moving books.

To understand how levels, and sliders work by deconstructing a pre - made product.

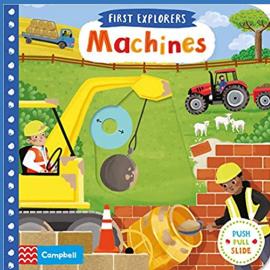
Use cutting and joining techniques to make levers, sliders and hinges.

Plan and design a moving non-fiction book that meets the design criteria.

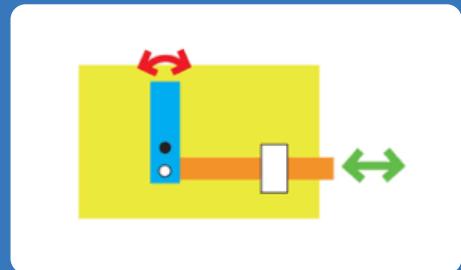
Use appropriate tools and materials to create an interactive wildlife book.

Evaluate and improve my design. Present books to Tameside Council to educate them about local wildlife and present an argument against new houses at Daisy Nook.

Design Brief



This book has sliders to move features and engage the reader.



This is a picture of a lever

Make a moving picture book to explain the importance of trees to the local wildlife.



This book has flaps with hinges so that the reader can interact with the book.

Researching Existing Products

We will design, make and evaluate a range of moving books.

We will research how publishers have used levers, sliders and hinges for the mechanical system on their books.

Health and Safety

- Tie back long hair
- Roll up your sleeves
- Walk safely and calmly around the classroom
- Keep your work and floor area clear
- Follow all instructions
- Hold scissors and other equipment appropriately

Key skills and related vocabulary:

Cut – Use scissors to make slits in the card

Shape – Accurately use scissors to cut around a neat outline

Joining materials – Use glue, split pins and treasury tags to join materials together

Hinges – Create a hinge to make a door or flap on a page

Stiffen – Difficult or impossible to bend

More stable – How likely something is to topple over if pushed

Lever – Something that can rotate about a fixed point

Slider – A feature of the page that moves up and down or side to side.

Climate change – A long term change in the average weather patterns

Punch – Using a hole punch to make a hole

Score – Using a ruler and a sharp pencil to make a clear fold in card

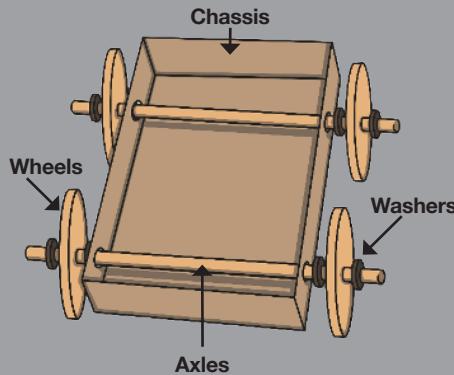
Publisher – A company that prepares books for sale

Design and make a Tram

Our Changing Planet

Design Brief

Design and make a tram that moves for the people of Ashton-Under-Lyne.



This is a labelled diagram of a chassis.

Health and Safety

- Remove any jewellery and tie back long hair
- Roll up your sleeves
- Walk safely and calmly around the classroom
- Keep your work and floor area clear
- Follow all instructions
- Hold scissors and other equipment appropriately
- Use any tools as instructed by an adult



key learning

To identify the design brief and research a product.

To test and then select the most appropriate materials and components to achieve a design criteria

To select and practise using the most appropriate tools and equipment to achieve a design criteria

To design a purposeful, functional and appealing product based on a design criteria

To make a purposeful, functional and appealing product based on a design criteria

To evaluate ideas and a product against design criteria and present the findings to Tameside council

Existing Products

Research products that have chassis, axles and wheels.



You can see the chassis in a Go Cart. You can clearly see how it holds the axles and wheels in place.



This is the chassis of a bus. You don't see the chassis or axles underneath the body of the bus.



The long tram has a carefully designed number of axles. Each carriage of the tram needs a different chassis.

key skills and related vocabulary:

Mechanism – a system of parts working together in a machine

Wheel – a circular object that revolves on an axle and is fixed below a vehicle or other object to enable it to move easily over the ground

Axis – an imaginary line about which a body rotates

Friction – the action of one surface or object rubbing against another

Dowel – a peg used for holding parts of a structure

Chassis – the base frame of a car, carriage or other wheeled vehicle

Washers – objects put on the dowel to stop the wheels sliding off

Research – the investigation into a study

Design – decide on the look and functioning of an object by making a drawing of it

Make – create something by putting parts together

Evaluate – making a judgement about the creation made

**Year
3**

Eco Houses

Design and Technology

Our Changing Planet

key learning

Understand what an eco house is. Research, draw and label findings.

Research, explore and create structures that can be used to create sturdy models.

Use measuring and sawing techniques to create and evaluate a cube shell structure.

Produce an annotated design plan of the model of an eco house.

Use the techniques and tools previously introduced to build the eco house. Evaluate and strengthen throughout the process.

Evaluate the eco house model and present the to the council what you propose the eco houses in Tameside need.

Design Brief

Make a prototype eco house that promotes sustainability. Present the design to the council.

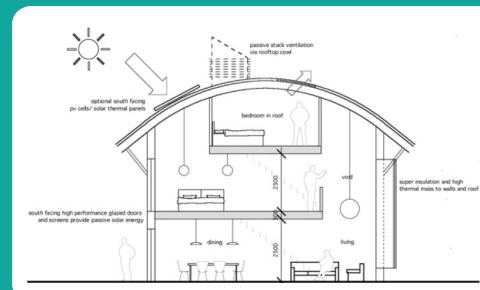
Researching existing products

- Research eco houses to generate a foundation of knowledge
- Use eco house guides to develop knowledge and understanding of materials and equipment used as part of an eco house.
- Scaffolding is a good example of a free standing structure. Research the importance of the diagonal lines in the frame that support the structure.

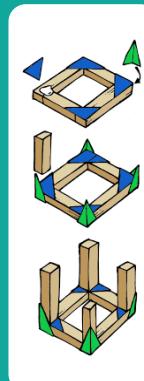


Technical drawing

A precise and detailed drawing of an object. The drawings are annotated (notes added), descriptions and accurate measurements. These drawings allow us to make the model accurately.



Free standing structures using a shell structure



key skills and related vocabulary:

Sustainability: maintained at a certain rate or level

Technical drawings with annotations

Materials will be cut, shaped and joined securely and accurately

- To do this we will need to mark out, score, saw and combine the materials in the most effective way (methods will be researched and evaluated)
- mark out:** draw lines/ arrows
- score:** line cut or scratched into a surface
- saw:** a hand tool for cutting wood
- combine:** join or merge materials

Finish: complete the manufacture or decoration to desired high standard

Measurement skills (practised in maths lessons) will be applied to achieve the desired dimensions of materials

Health and Safety

- Tie back long hair
- Roll up your sleeves
- Walk safely and calmly around the classroom
- Keep your work and floor area clear
- Follow all instructions
- Hold scissors and other equipment appropriately
- Use a saw on a 1-1 basis with a member of staff.

Year 4

Design and Technology

Making a model wind turbine

Our Changing Planet

Key learning

Carry out research about wind turbines.

Investigate effective wind turbine designs evaluating shape, size and material.

Investigate how gears work.

Design a scaled wind turbine
Use cross-sectional diagrams.

Use design sketches to build a scaled model of a wind turbine.

Evaluate and improve the scaled model.

Plan and present findings of the project

Design Brief

Research, plan and make a scaled model of a wind turbine. Present your model to Tameside Council and explain how wind turbines work.

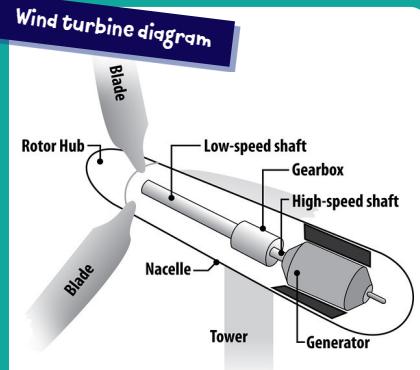


Health and Safety

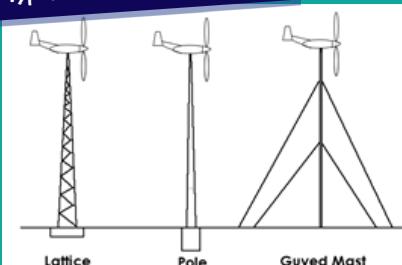
- Tie back long hair
- Roll up your sleeves
- Walk safely and calmly around the classroom
- Keep your work and floor area clear
- Follow all instructions
- Use any tools as instructed by an adult

Researching Existing Products

Wind turbine diagram



Types of wind turbine towers



A picture of a wind farm



key skills and related vocabulary:

Turbine - A turbine is a type of engine that can extract energy from sources like air, steam and water

Wind farm - A grouping of wind turbines in an area.

Rotor - The part of a turbine that turns

Blades - The blades are attached to the rotor and catch the air

Nacelle - The housing at the top of a turbine that holds all the components

Gearbox - Contains the gears

Gear - Wheels with teeth that slot together

Generator - Converts energy from the turning rotor to electrical energy

Tower - The structure that holds the nacelle

Foundation - The base that is in the ground. It carries the weight of the whole turbine

Cross-sectional diagram - A cross section diagram is what you would see if you could take a 'knife' and cut through the object and see what the new surface/profile looks like.

Making a Model Pulley System

Our Changing Planet

Key learning

Know what a pulley system is. Investigate existing products that use pulley systems.

Understand how a pulley system works by using different weights and different heights.

Demonstrate how a pulley system works using K'Nex.

Use annotated sketches to design a scaled down pulley system to lift heavy objects.

Use the design sketches and a range of suitable tools to create a model pulley system to meet the design brief.

Evaluate and improve the model. Present the findings of the project.

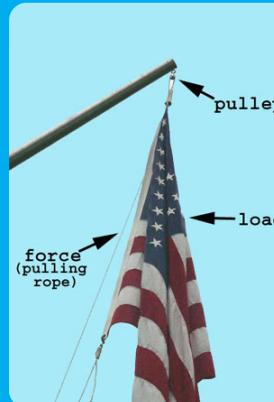
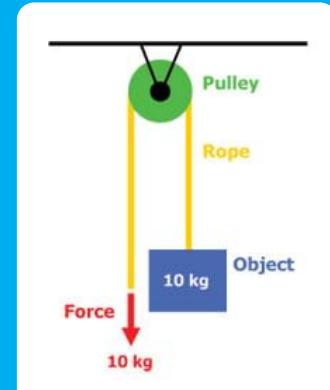
Design Brief

Create a model Pulley System to be used to lift Solar Panel equipment to roof tops of high buildings.

Existing Products that use Pulley Systems

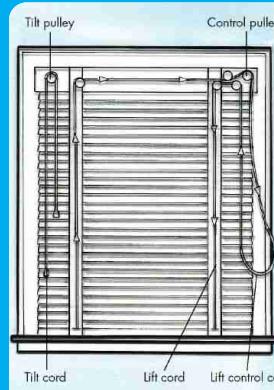
All about pulleys

www.youtube.com/watch?v=r3Ru1zJvug



Flag poles

Flag poles use pulleys in order to hoist the flag up or down. You pull the string on the pulley and the flag runs up and down the pole.



Blinds

Blinds on windows operate with a pulley system to move the blinds up and down.

You pull the cord on the pulley systems which moves them blind in the direction you want it to go.

Health and Safety

- Tie back long hair
- Roll up your sleeves
- Walk safely and calmly around the classroom
- Keep your work and floor area clear
- Work one to one with an adult when using the saw
- Hold scissors and other equipment appropriately
- Wear sensible shoes when working with weights
- Wear an apron or other protective clothing



Key skills and related vocabulary:

Pulley: A wheel with a grooved rim around which a cord passes, which acts to change the direction of a force applied to the cord and is used to raise heavy weights.

Structure: A building or other object constructed from several parts.

Sustainability: Avoidance of the depletion of natural resources in order to maintain an ecological balance.

Design: A plan or drawing produced to show the look and function or workings of a building, garment, or other object before it is made.

Annotated sketch: a detailed sketch that is labelled with critical dimensions, notes, and symbols.

Assemble: Fit together the separate component parts of (a machine or other object).

Materials: The matter from which a thing is or can be made. For example.; cloth, plastic, rubber, metal.

Prototype: A prototype is a sample, model, or release of a product built to test a concept or process.

Prototypes of electronic cars

Our Changing Planet

Design Brief

Research, plan and make a working Prototype of an electric car and present your model to Tameside Council, showcasing knowledge and benefits of electric cars.

Key Skills:

- Cut • Shape • Join
- Finish • Make prototypes
- Use models • Kits and drawings to help formulate design ideas

Health and Safety

- Remove any jewellery and tie back long hair
- Roll up your sleeves
- Walk safely and calmly round the classroom
- Use any tools as instructed by an adult

Key learning

Carry out research about a product.

Design a product.

Build a prototype and test materials.

Evaluate and finalise a design.

Make and build a product.

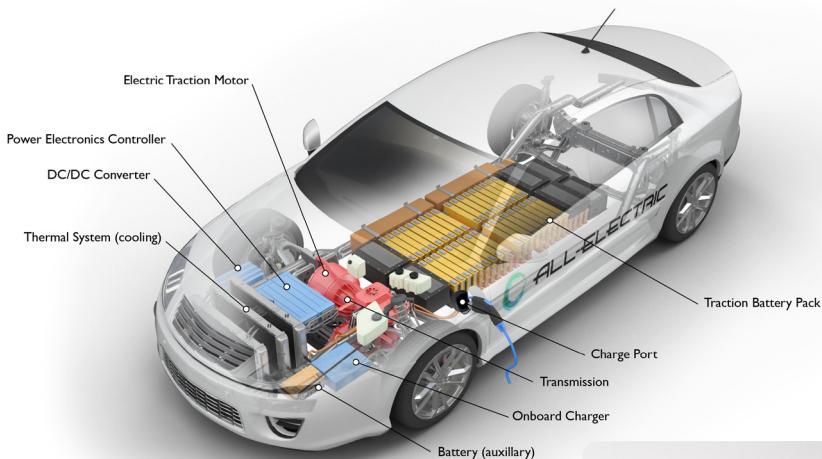
Evaluate and present a product.

Existing products

Lots of large car companies are beginning to produce both electric and hybrid cars e.g. BMW, Toyota etc.

Cars can be plugged in to charge at the mains rather than filled with petrol.

All-Electric Vehicle



key skills and related vocabulary:

Analysis – detailed examination.

Axle – a central shaft for rotating wheels.

Bearing – this retains the axle in position whilst allowing it to rotate.

Brief – a set of instructions about a job or a task.

Drive belt – the belt which connects and transfers movement between two pulleys.

Evaluate – make a judgement about something.

Prototype – a test, or original, model of a product from which improvements, upgrades or fundamental changes can be made.

Pulley – a grooved wheel over which a drive belt can run.

Series circuit – a circuit with only one possible path for the current.

Short circuit – an incorrect route in a circuit which misses out certain components and can cause the circuit to fail.

Specification – a precise requirement.

Exploded Diagram – a technical diagram that shows the relationship of different parts.

Cross sectional diagram – a diagram to show something that has been cut in half so that you can see the inside.