

Year 1 Design and Technology: Structures: Constructing a windmill

Key Learning

Design

I am designing a _____ for _____

My product will be _____

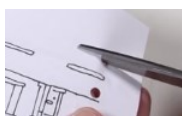
Drawings can be used to plan ideas.



The same **product** can be made from different **materials**.

We can test different materials to see which would work best.

Make



Holes can be used to make it easier to cut slits using scissors.



Holes can be made using a hole punch or a sharp pencil and blue tack.

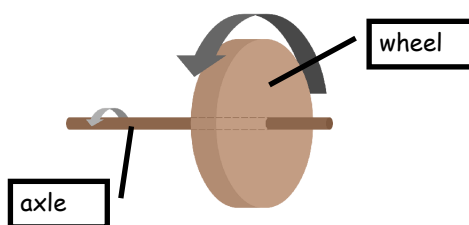
Evaluate



Some products meet or don't meet the design idea.

Technical Knowledge

Wheels and **axels** can be used to make things move.



Key Vocabulary

Mechanism	A small piece of card stuck to a slider to keep it in place.
Sliders	Something which can move from side to side or up and down.
Stable	To make something strong.
Lever	Can be used to make things move up and down or from side to side.
Turbine	The parts that move in the wind.
Axle	The point that makes the turbine or sails move.
Design	A drawing to support our ideas and plan how we are going to make it.
Windmill	A structure with sails that are moved by the wind.

Year 1 Design and Technology: Mechanisms: Making a moving story book

Key Learning

Design

I am designing a _____ for _____

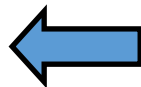
My product will be _____

Drawings can be used to plan ideas.

Make

Moving story books allow you to move characters across the background.

Characters can move



left



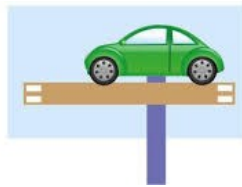
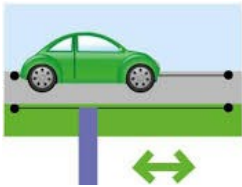
right

Evaluate



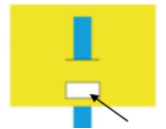
Some products meet or don't meet the design idea.

Technical Knowledge



Sliders can be used to make things go forwards and backwards or up and down in a straight line.

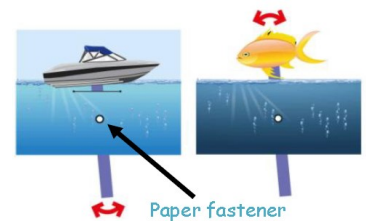
A bridge can be added on the back to keep the slider in place.



Levers can be used to make things move up and down or from side to side.



Extra layers of cardboard can be added to make things stronger.



Paper fastener

Key Vocabulary

Model	A good example for people to follow
Tool	Something to help you with a specific job eg scissors
Equipment	A set of things needed for a purpose
Materials	Anything used for making something else.
Cutting	To take a piece off using scissors or a knife
Shaping	To make something into a shape
Stiff	Not able to bend or change shape
Strong	Not easily broken
Test	To check if it works.

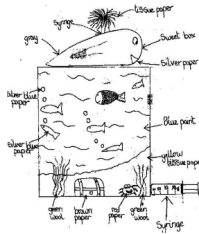
Year 2 Design and Technology: Structures- Baby Bear's chair

Key Learning

Design

I am designing a _____ for _____

My product will be _____



Make

The glue gun, sellotape and PVA glue straws and pipe cleaners can be used to join materials.

Think about Baby Bear's chair, is it strong, stable and comfortable?



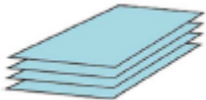
Evaluate

I think the product/ my product is successful because _____

It would be better if _____

Technical Knowledge

We can make our structures stronger by **laminating**. This is when you glue together several layers of material such as card or paper.



Rolling pieces of paper also creates it stronger and gives more stability.



Natural Objects



Man-made Objects



Key Vocabulary

Man-made	Something which is made by humans or machines
Natural	Something which is created by itself, not by humans or machines
Strength	How strong something is.
Stable/ stability	When an object will not turn over or give way.
Stiff	When a material is not easily bent.
Structure	A building of the main parts. Putting them together to give a shape.
Joining	Attaching to things together.

Year 2 Design and Technology: Mechanisms: Making a moving vehicle

Key Learning

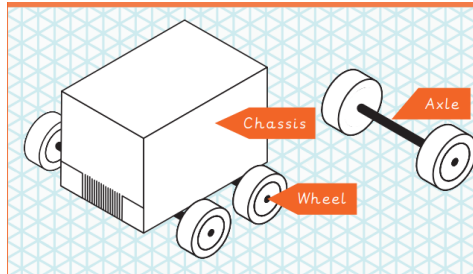
Design

My design is for _____
My design will move by _____

Investigate how wheels move and how they can be fixed.

Design a vehicle with specific design specifications.

Make



Create their own design, ensuring it meets the criteria.

Evaluate

I think this product does / does not fulfil its function because...

My product is suitable for the user because...

This could be improved by...

A judging panel will assess whether it meets the requirements.

Types of wheels

Types of wheels



Wood/card/mdf



Plastic

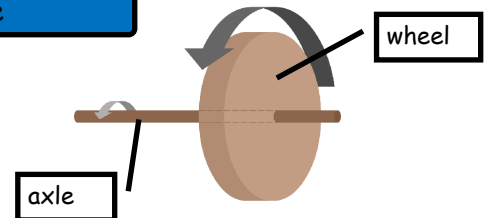


Cotton reels



There are different types of wheels made from different materials that can be used in vehicles.

Technical Knowledge



Wheels and axles can be used to make things move.

Key Vocabulary

Model	An example of the object
Vehicle	Used to move people or goods eg car, van, or lorry
Strength	Something which can be made stronger.
Move	Go forwards or backwards
Structure	A building of the main parts. Putting them together to give a shape.
Axle holder	
Wheel	Circular object which is attached to the axle. It is fixed to a vehicle to allow it to move easily.
Axle	The rod which passes through the wheel

Year 3 Design and Technology: Mechanisms: Making a moving monster

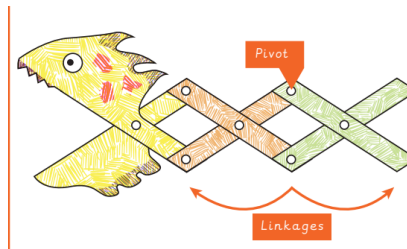
Key Learning

Design

My design is for _____
My design will move by _____

Explore linkages and the input and output movements. Design a moving monster, labelling it to indicate the parts that move and the direction of the movement.

Make



Select from a range of materials and components to create their moving monster.

Evaluate

What I liked about my monster was.....

If I were to make it again, one thing I would change would be.....

Technical Knowledge

The four types of motion:



Linear motion
Movement in a straight line in any one direction.



Reciprocating motion
Movement in a straight line, back and forth, in any direction.



Rotary motion
Movement in a circular motion.



Oscillating motion
Movement in a curve, back and forth.

Key Vocabulary

Axle	The rod which passes through the material.
Slider	Used to make things go forwards and backwards.
Attach	Join or fasten something to something else.
Input movement	The energy needed to start something working.
Output movement	The motions which results from the input motion.
Pivots	A central point in which a mechanism moves.
Component	A part of a machine or vehicle.
Linkages	The connection or the act of connecting.

Year 4 Design and Technology: Structures: Making a pavilion

Key Learning

Design

My design is for _____
My structure will be _____

Explore structures before designing a pavilion which will be for a specific audience, allowing for a space to provide shelter, with a frame structure.

Make



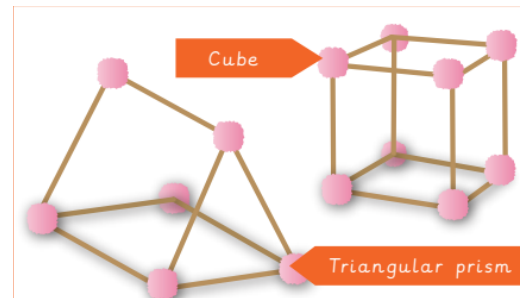
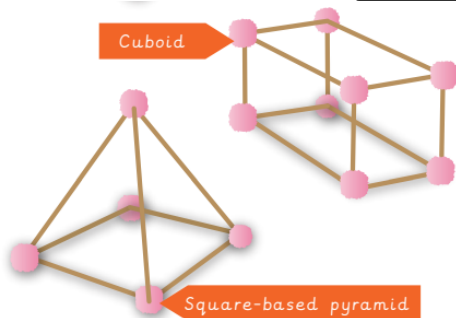
Select from a range of materials and components to create their pavilion, assessing and adjusting their designs to ensure their structure is strong, stable and free-standing.

Evaluate

What I liked about my pavilion was.....

If I were to make it again, one thing I would change would be.....

Technical Knowledge



Key Vocabulary

Engineer	A person who designs, builds and maintains structures.
Housing structure	Something that has been made and put together and can usually stand on its own (e.g. a building, a bridge, a chair).
Assemble	Join together to make the frame.
stable	Object does not easily topple over.
frame	A way of building something so that the inside supports are built first and the outside covering is added afterwards as cladding.
Properties	The components which make up the shape. Eg the amount of edges, faces and vertices
pavilion	A decorative building or structure for leisure activities.
cladding	A material put on top of another material or on a structure as protection or to improve appearance.

Year 4 Design and Technology: Electrical: Torches

Key Learning

Design

My design is for _____
My design will include _____

Explore structures before designing a pavilion which will be for a specific audience, allowing for a space to provide shelter, with a frame structure.

Make

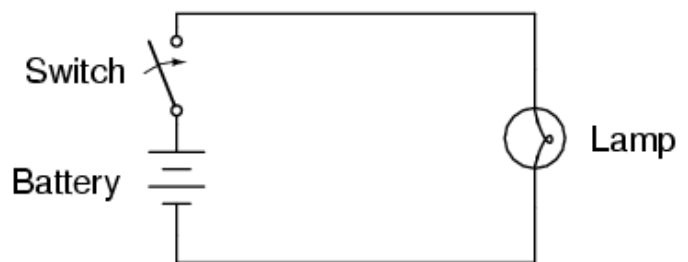


Create a working switch, make a reflector and secure the two ensuring the circuit doesn't rattle.

Evaluate

Does my torch light up?
Is the circuit secure?
Does the switch work?
Does the torch meet the design criteria?

Technical Knowledge



Key Vocabulary

Circuit	A closed circuit where the current follows one path.
Switch	A circuit part that you can open or close to allow electricity to flow through or to stop it flowing through. (For example, in a house, an electric light switch lets you turn the lights on or turn the lights off.)
Bulb	A circuit part, made from glass or plastic, which gives out light when electricity passes through it.
Buzzer	A circuit part which will make a buzzing noise when electricity is passed through it.
Motor	A circuit part which makes something move.
electricity	A type of energy, that is usually invisible, that can be made or stored and used to make objects work (for example to move things or to heat them up).
Light	Makes things visible.
Battery	Two or more cells put together to provide electrical energy to power a circuit.
Conductor	A material that allows electricity to flow through it. e.g. metal.
Insulator	A material which does not allow electricity to flow through it.
Housing	Somewhere to put the electrical system to keep it dry and unharmed.
Reflector	Metal which changes the direction of the light in a specific direction.

Year 5 Design and Technology: Electrical: Steady Hand Game

Key Learning

Design

My mechanical shop window must:

1. Include 3 moving objects.
2. Include a suitable theme.
3. For Shop.

Research a range of children's toys before designing our own,

Make



Construct the base and the circuit before decorating it.

Evaluate

What I liked about my game was.....

If I were to make it again, one thing I would change would be.....

Circuit symbols:

wire

switch open

switch closed

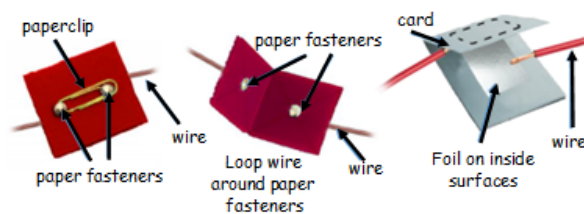
battery

buzzer

bulb

Technical Knowledge

Switches are used to complete a circuit. You can decide when you want to close the switch which will complete the circuit and make your product work.



Key Vocabulary

Product	The end piece made.
Electromagnetic motor	Converts electrical energy to mechanical energy
symmetrical,	The same on both sides.
Buzzer	A circuit part which will make a buzzing noise when electricity is passed through it.
Wire	Metal drawn out to form a thin flexible thread.
circuit	A closed circuit where the current follows one path.
net	A 3D shape broken down into a flat form

Year 6 Design and Technology: Structures: Automata toys

Key Learning

Design

In my research, I have found _____

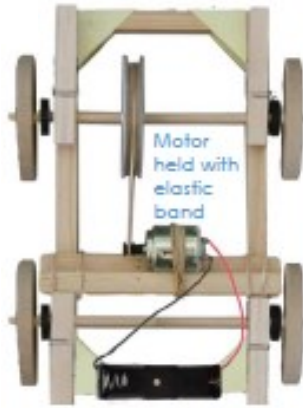
Features of a successful product are _____

My product will work like this _____

My product will meet the needs of its user by _____

I have applied the design specification to my product by _____

Make



You can make a simple toy car by attaching a **motor** to your structure and using an **elastic band** as your **drive belt** to attach the **motor** to the **pulley**.

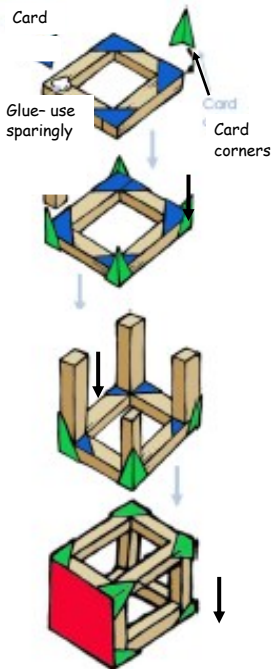
Evaluate

My product does / does not meeting the needs and wants of the user because _____

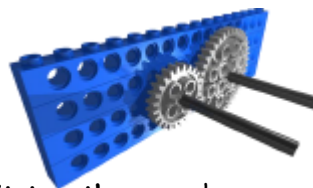
My product is / is not appealing because _____

My product is / is not innovative because _____

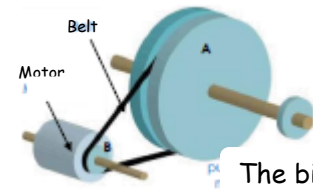
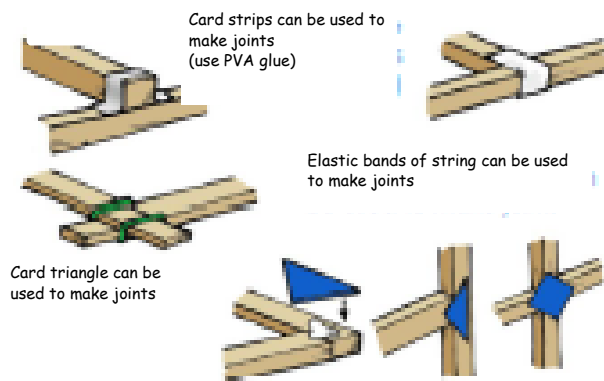
Technical Knowledge



Gears can fit together so when one gear rotates, the others will too.



Joining thin sectioned pieces of wood



The bigger wheel is the **pulley**.

Creating **triangles** in your structure can **strengthen** it and make it more **stable**. There are different ways of doing this. You could glue card triangles to join two pieces of wood together, or use another piece of wood, paper or a plastic straw to connect two corners together.

Key Vocabulary

Automata	Automata toys are sometimes known as mechanical toys. They use hand-powered mechanisms to create movement.
Drive belt	A loop of flexible material used to link two or more mechanisms together.
Pulley	A wheel on an axle that is designed to support movement.
Motor	A machine that supplies power to a vehicle or device.
Rotary Motion	The motion of a certain object that is spinning in a fixed place. A spinning wheel is an example of this.
Linear Motion	When an object moves in a straight line.
Gears	A wheel and axle that has teeth along the wheel.
Linkage	This is joined to one or more levers to provide movement.
Rotates	To turn about on a centre.

Year 6 Design and Technology: Electrical: Programming Pioneers

Key Learning

Design

In my research, I have found _____

Features of a successful product are _____

My product will work like this _____

My product will meet the needs of its user by _____

I have applied the design specification to my product by _____

Make

Evaluate

My product does / does not meeting the needs and wants of the user because _____

My product is / is not appealing because _____

My product is / is not innovative because _____

Technical Knowledge

Key Vocabulary

Program	A set of coded software instructions
Prototype	A model of what the final product could look like
Control	To be in charge of something
Algorithm	A set of rules which must be followed in a computer device
Automatic	A device which works by itself without human interference
Cam	