Willow Lane Design & Technology Curriculum

Our intent

Through the teaching of design and technology at Willow Lane, we aim to create problem solvers, creators and producers. They will have the necessary skills and knowledge to understand how products are made, and the design process behind it. They also have some fundamental life skills from how to cook a nutritious meal, to how to trouble shoot and solve problems as they arise, to how to use emerging technology to design and create.

Children will be taught the knowledge of how to use different materials, how to cut and shape them for their own purposes using a variety of tools. They will learn how to create different mechanical and electrical systems. They will learn how to be healthy and to how create seasonal, affordable healthy snacks. We teach to the heart quite literally with this strong link of cooking skills woven throughout the curriculum. We also 'teach to the heart' by creating rich opportunities for our children to solve problems and to create, trial and evaluate solutions of their own.

At Willow Lane, you will see children experimenting with different ways of joining objects to create castles, monuments, and giant marble runs. You will see children using different mechanical and electrical systems to create space explorers, games and toys. You will see children learn how to sew to create puppets, covers, bags or stuffed toys. You will also see children preparing and making delicious and nutritious smoothies, snacks and meals. Children will also experience a range of local designers and producers and will learn how to present and showcase their work. Our children develop the aspirations, knowledge and skills to thrive and become shapers of tomorrow's world.

Our curriculum provides a detailed interpretation of the National Curriculum statements. We have adapted the guidance within the National Curriculum to meet the needs of the children at Willow Lane and created a broad and balanced curriculum. It provides opportunities for children to delve deeper and apply their knowledge in a wide range of contexts. Furthermore, we know our children learn more when they are provided with memorable experiences with which to anchor and link their learning. These experiences provide opportunities for rich discussion and enable children to develop their cultural capital and vocabulary.

Willow Lane Community Primary School

Assessment in DT

How we assess

Each unit begins with a short introduction, which sets the scene for later learning. This is usually presented in the guise of a problem. Children are taught to empathise with the users, build up knowledge and necessary skills and then create ideas to solve the problem. They will evaluate their ideas in relation to the problem and select an idea to develop. Children may also prototype different ideas to help explore solutions. Finally children will have a product that can be judged on its success at solving the problem intended. Within each year, and usually within each unit children will look at an individual or invention or discovery that changed the world. Over the course of the unit, children learn the necessary technical language and foundational knowledge to help them communicate how they can solve problems.

Teachers use the 'I will know…'and 'I will know how to…' statements in each unit to assess whether children are achieving age related expectations. Teachers use formative assessment as an opportunity to identify strengths in the unit and plan opportunities to further deepen and broaden children's learning. It is also an opportunity to identify children and areas that require further consolidation and plan future learning episodes accordingly. The teaching sequence should be based on the stages of the design process, although there will have to be discrete lessons set aside for children to learn and practise certain skills, or to gain specific knowledge.

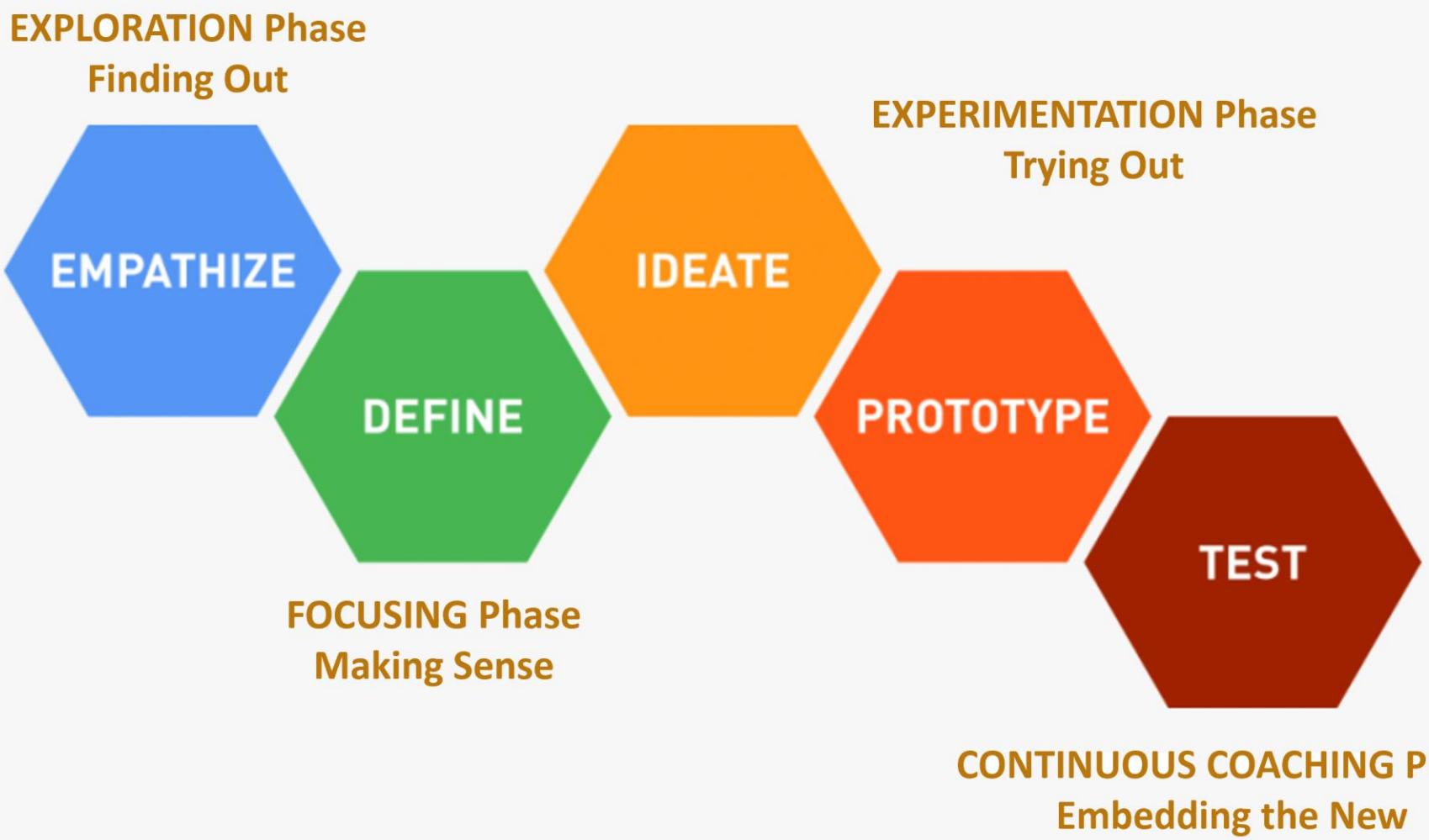
Unit outcomes allow teachers to identify those who are working towards unit expectations, those who are meeting the expectations for the unit and those who are working at greater depth within the unit. Outcomes may take the form of low-stakes testing, reports, presentations or other creative tasks that allow children to showcase their learning.

Children not meeting the expectations for a unit, or where gaps are identified, will be given further opportunities to revisit the foundational learning identified in each unit. This may be through regular retrieval tasks based on the 'Learning Checks' or through planned learning tasks designed to enable learners to revisit and apply earlier knowledge or skills in a new context.

The outcomes and 'Learning Checks' also support the subject lead in identifying strengths and areas for further development in the curriculum design and teaching and learning of design technology.

The overview of the progression in design and technology skills is shown on the next page. Key skills for each unit should be selected from the overview that meet the needs of each class. To assess children's historical enquiry skills, teachers observe the execution of skills that have been previously modelled and take note of those children who are not yet secure in using them. If children are not yet secure in the skills, further opportunities are planned in later learning episodes for children to revisit them. If children are secure in the skills, then opportunities to broaden the skills and apply them in new contexts are planned as appropriate.

DESIGN THINKING PROCESS STEPS



Acknowledgement:
IDEO, Stanford Design School

DESIGN THINKING

A FRAMEWORK FOR INNOVATION

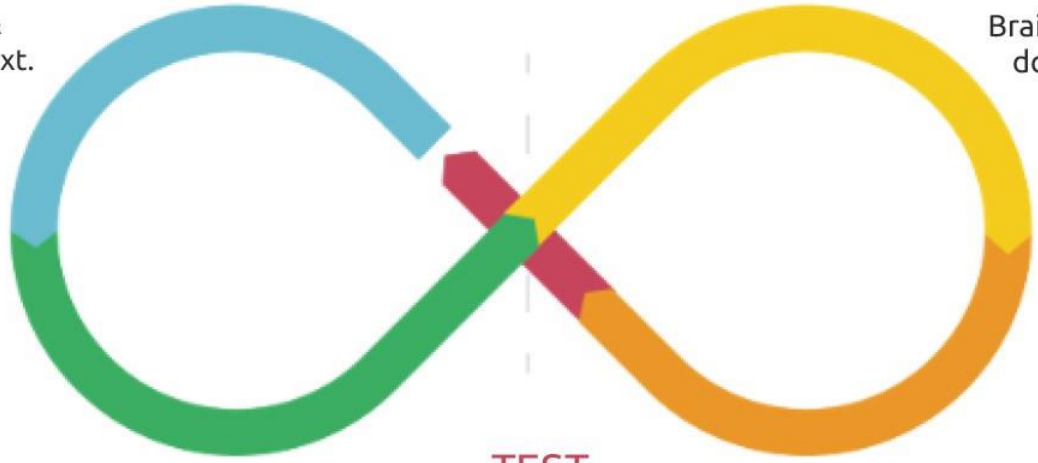
EMPATHISE

What Is the problem?
Define the challenge &
explore the human context.

IDEATE

How do we solve It?
Brainstorm ideas good & bad,
don´t stop at the obvious.

CONTEXT



FORM

DEFINE

Why Is It important?
Research, observe, understand
& create a point of view.

TEST

Does It work?
Implement the product, show &
don´t tell, start to refine the product.

PROTOTYPE

How do we create It?
Start creating, experiment,
fail cheap & fast.

Willow Lane Design Technology Overview

Year group	Autumn		Spring		Summer	
EYFS: Red	Busy Being Me	Celebrations	Magic Time Machine	Our Wonderful World	Wet and Wild	When I Grow Up
1. Orange	Enhancements: paper straw bridges, newspaper bridges, Investigate wheels and axels – simple junk model car		**Make a fruit and veg smoothie and packaging** Enhancements: Make a face with moving parts e.g. mouth with split pins, eyes on sliders		**Make a mini-monument** Enhancements: mini-gardens, poly-tunnel for seedlings, junk-model toy	
2. Yellow	Enhancements: make a model tourist attraction, make a model town/area, make a relief map		**Make an exploration vehicle** Enhancements: a slingshot rocket		**Make puppets for a beach puppet show** Enhancements: Make a paper windmill, fairground wheel, bunting	
3. Green	Enhancements: Make a story poster that uses magnets to move a character a long, Make a shadoof, electrostatic game, use different materials to make a pyramid		**Make a moving monster** Enhancements: mini houses from stone-age through to iron age		**Make a healthy picnic wrap** Enhancements: Cold frame for seedlings, paper straw Eden dome.	
4. Blue	Enhancements: flood defences, aqueduct, make a recycled castle, the invention of corners - joining two sides together		**Make a Morse-code machine,** Enhancements: slingshot car, pneumatic arm		**Make a passport/phone/book holder** (out of cotton)	
5. Indigo	Enhancements: Wartime rations – what could you make? Make-do and mend project		**Make a marble run** Enhancements: catapult, bridges, pavilion temple		**Make a healthy meal**	
6. Violet	Design a device to monitor your location (CAD) Enhancements: make an adventure map for a beebot		Enhancements: earth's crust model (with pneumatics/hydraulics)		**Design and make an eco-product for the summer fair** (Fairtrade, local, organic) I.e. a tote bag, a toy for children to play at the summer fair	

Knowledge and Skills from National Curriculum

	Design	Make	Evaluate	Cooking and nutrition
	Throughout: understand how key events and individuals in design and technology have helped shape the world			
KS1 **(age 5-7)**	Use a success criteria to design products Design products that have a purpose/function Design products that are appealing Generate ideas Develop ideas Communicate ideas through talking, drawing, templates, mock ups and use of ICT	Use a range of tools and equipment Choose appropriate tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing] select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics	explore and evaluate a range of existing products Evaluate materials and their properties evaluate their ideas and products against design criteria	use the basic principles of a healthy and varied diet to prepare dishes understand where food comes from.
Lower KS2 ***(age 7-9)***	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	select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately apply their understanding of how to strengthen, stiffen and reinforce more complex structures understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors	investigate and analyse a range of existing products	understand and apply the principles of a healthy and varied diet prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed
Upper KS2 ***(age 9-11)***	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 materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages] apply their understanding of computing to program, monitor and control their products.	evaluate their ideas and products against their own design criteria and consider the views of others to improve their work	

Knowledge and Skills (from national curriculum but adapted to be more specific)

	Design	Make	Evaluate	Cooking and nutrition
	Throughout: understand how key events and individuals in design and technology have helped shape the world			
KS1 **(age 5-7)**	(year 1) Generate success criteria as whole class (year 2) Select elements for own success criteria Have a clear purpose/function in mind when designing Design products that look appealing Have more than one design idea Talk about ideas Draw and label idea Use a template for a puppet Use ICT to design e.g. on sketch app Create a prototype/basic design e.g. simple junk model car	Use a range of tools e.g. scissors, needles, thimbles, needle threader, staplers, brushes for paint and glue, tape, split pins, pipe cleaners, Paper, paper straws, card, packages, tech card, wheels and rods for axels, felt, a range of materials/objects for finishing and decorating Knives, graters, chopping boards (blender with adult support) A wide selection of fruit and vegetables. and equipment Use additional material to reinforce structures	explore a range of existing products Evaluate in terms of fun, taste, appearance, Evaluate materials in terms of strength, flexibility, texture Evaluate shapes in terms of stability for structure (wide flat base = most stable) Evaluate their ideas and products against success criteria Decide which part of the success criteria is most important	Understand importance of food hygiene Know what healthy means Know where food comes from Know what part of the plant fruit and vegetables are Know that vitamins come from fruit and vegetables Cut soft fruit and vegetables Grate harder fruit/vegetables Combine ingredients
Lower KS2 ***(age 7-9)***	Research context of problem Research other products Use research to develop design criteria Aim product at particular individuals or group Select from a combination of innovative (most challenging), functional, appealing points for their criteria. Explain their ideas, question others' ideas Develop ideas through annotated sketches Develop ideas through cross sectional diagrams Make prototypes e.g. out of card, or playdoh	Use a wider range of tools and equipment e.g. scissors to cut and score, craft knives, hacksaws, glue guns, hole punch, hand drills Use a wider range of materials, equipment e.g. different systems Know that cylinders are a strong supporting structure because they have no corners so support the weight evenly Know that corners are the weakest part of a structure Reinforce corners e.g. with right angled triangles Know that triangles are a strong shape because their corners spread the weight out more evenly Know that wide flat base, and low centre of gravity gives a strong structure Use pneumatics to create movement Use electrical systems e.g., circuits incorporating switches, lights and buzzers.	Investigate a range of products – test them out purposefully. Use investigations to create a range of questions about products to analyse further Analyse a range of products – e.g. what they're made from and why, what works well and what doesn't	understand and apply the principles of a healthy and varied diet when designing a snack Prepare and cook a snack (rolling and joining pastry, mixing, baking) Understand seasonality – use vegetables in season, preferably from allotments. Know how some ingredients are grown and processed.
Upper KS2 ***(age 9-11)***	Research context of problem and need and users Generate a range of ideas and develop more than one idea more fully. Communicate ideas through talk, sketches and annotated exploded diagrams. Use prototypes to develop and evaluate ideas Use computer-aided design and computer-aided design	Apply more independence in their choice of materials and tools – judging things on their use, material properties, aesthetics, ethical credentials. Apply knowledge of how to strengthen, stiffen and reinforce structures Integrate mechanical systems in their products, e.g. pivots and axels in marble run, pneumatics in year 6 summer project apply their understanding of computing to program, monitor and control their products. (in partnership with a high school such as Grammar School)	Investigate and analyse products to create design criteria. Evaluate products against design criteria Evaluate own prototypes and products against design criteria Suggest & consider ways of improving designs of others and their own work.	Understand and apply principles of a healthy and varied diet when designing a healthy meal Know how ingredients are grown, reared and processed Know what fair trade means Know what organic means Know a basic sauce Adapt a recipe Build on previous cooking techniques e.g. use boiling, melting, sautéing, grilling

Equipment, tools, materials progression for specific DT areas

	Cutting	Joining	Materials	Cooking	Systems
KS1	Use scissors to cut paper and card Bend, fold, and tear materials Punch holes with pencil (using a rubber or something similar behind the pencil for safety)	Use PVA glue, glue sticks, adapted/own-made glue, playdoh, blutac, Use masking tape, celotape, sticky-back paper, Use staples Thread a needle Tie a knot Use running stitch Reinforce structure using additional materials Use tabs when joining card/paper Link materials together e.g. with pipe cleaners	Use variety of paper and card Use paper straws Use premade materials (e.g. junk modelling, tech card) Use felt Use cocktail sticks	Hold knife safely and effectively Cut ingredients using claw grip Grate ingredients safely	Use axels and wheels Use pivots, levers and linkages
Lower KS2	Use hole punch and hand drill where necessary to punch holes in stiffer materials use secateurs, wire cutters to cut stiffer materials Use a hacksaw to cut wood to length Use sandpaper to smooth	Develop above skills and… Use glue gun with adult support Use cross stitch Use appliqué Understand importance of seam allowance when joining textiles Use hammer and nails to join Use additional materials to provide support (e.g. right angle triangles to support corners, joining elements of structure together for additional support)	Use stiffer materials e.g. polystyrene, reinforced card,, plywood, doweling and strips of wood Use craft sticks Use another type of fabric other than felt (e.g. cotton, hessian, fabric off-cuts from somewhere like Standfast & Barracks)	As above and… Develop some cooking techniques e.g. folding when combing wet and dry ingredients, rolling and joining pastry, baking Use seasonings, toppings or bastes for additional taste/effect	Develop use of pivots and levers in products Use another type of mechanical system such as pneumatic system to create movement Use pulleys in Forest School Use electrical circuit with buzzer and/or light
Upper KS2	As above but with growing independence	As above but with growing independence If sewing: use blanket stitch Use backstitch	As above and… Use a 3D printer Use materials according to its properties, aesthetic qualities, ethical credentials	As above and… Adapt a recipe Develop cooking techniques, (e.g. melting and combining, sautéing, boiling, grilling)	Develop and apply understanding of potential energy to create movement, e.g. elastic, gravity Apply understanding of computing to program, monitor and control products (in partnership with another school such as Lancaster Grammar School)

Timeline for individuals and events in design & technology

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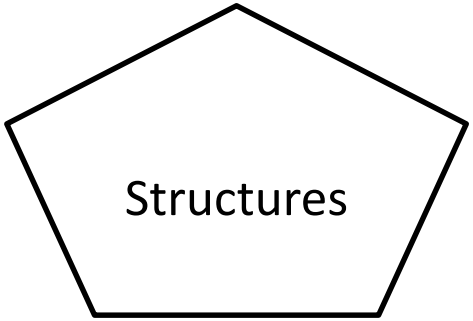
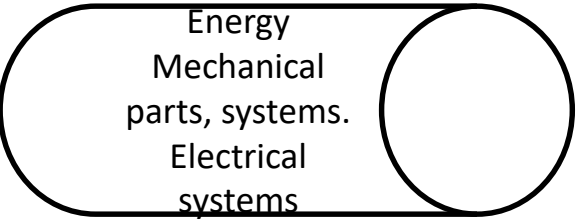
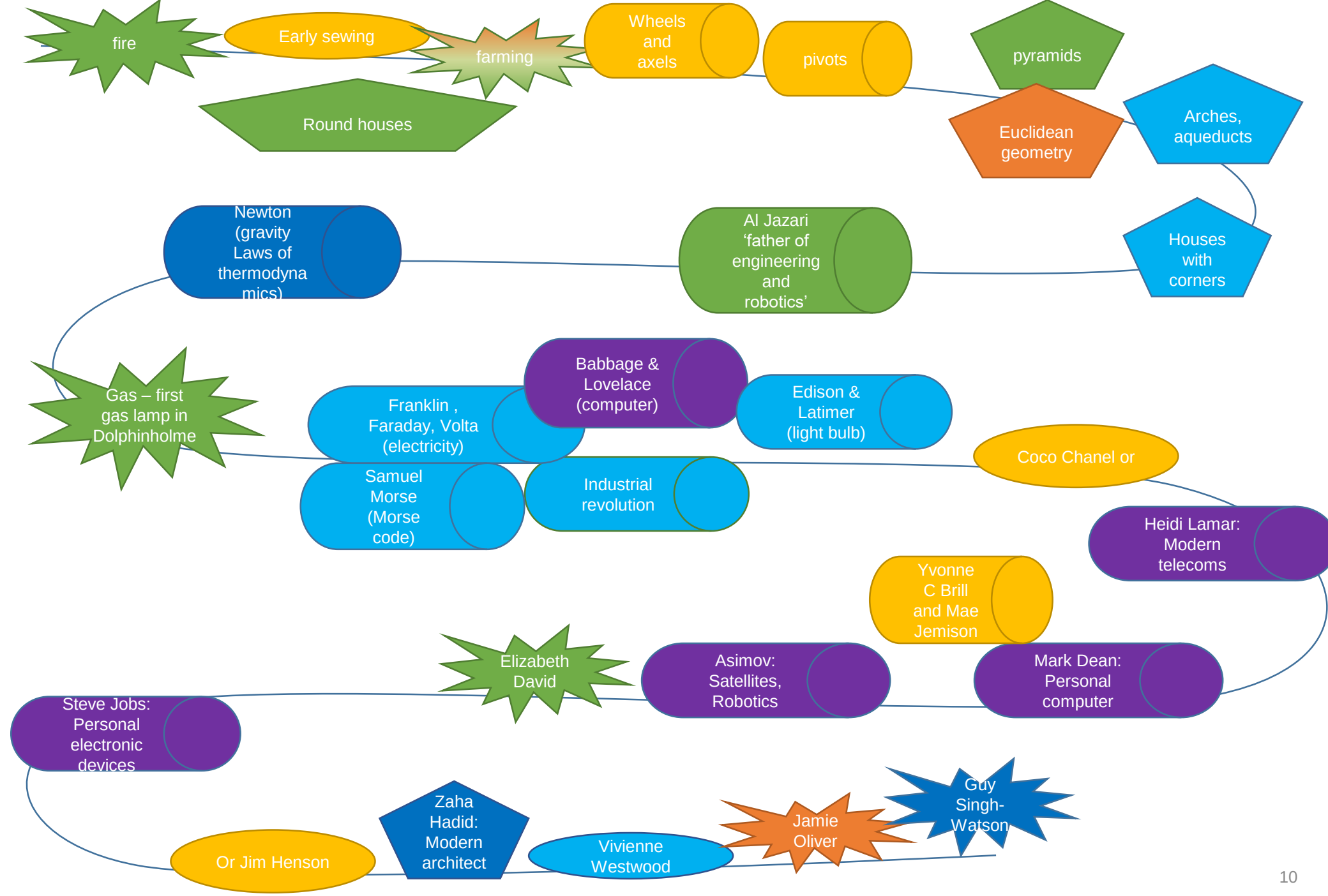




	Year 1
	Year 2
	Year 3
	Year 4
	Year 5
	Year 6


fire
Early sewing
farming
Wheels and axels
pivots
pyramids
Round houses
Euclidean geometry
Arches, aqueducts
Newton (gravity Laws of thermodyna mics)
Al Jazari 'father of engineering and robotics'
Houses with corners
Gas – first gas lamp in Dolphinholme
Babbage & Lovelace (computer)
Franklin , Faraday, Volta (electricity)
Edison & Latimer (light bulb)
Coco Chanel or
Samuel Morse (Morse code)
Industrial revolution
Heidi Lamar: Modern telecoms
Yvonne C Brill and Mae Jemison
Elizabeth David
Asimov: Satellites, Robotics
Mark Dean: Personal computer
Steve Jobs: Personal electronic devices
Guy Singh-Watson
Jamie Oliver
Zaha Hadid: Modern architect
Vivienne Westwood
Or Jim Henson

Reception: Creating with Materials

Overview:

Children joining us in Reception will have a range of differing experience to bring to their learning at Willow Lane. Children joining us from Appletree Nursery will have a range of experiences linked to design technology. They will have explored designing, building and creating with a range of different materials, including blocks, sand, playdough and loose parts.

In Reception, we support children in developing their understanding of design technology through different themes throughout the year. We plan in focused learning interactions to explicitly introduce and teach new ideas. We create continuous provision opportunities that allow us to provide repeated opportunities for children to experience and understand elements of design technology. We also create space in our curriculum to follow children's interests and build on their prior experiences. This combination of approaches encourages the characteristics of effective learning and provides all children with a strong basis on which to develop their understanding of design technology as they move into Year 1.

Resources:

EYFS Long Term Plan
Development Matters

Early Years Foundation Stage Early Learning Goals
Safely use and explore a variety of materials tools and techniques, experimenting with colour, design, texture, form and function. Share their creations, explaining the process they have used.

Reception: Creating with Materials

I will know:

- the names of different materials.
- that some materials are stronger than others.
- we can make models of other places and things.
- that we should eat a range of foods to stay healthy.
- that drinking water and eating fruit and vegetables is good for us.

I will learn how to:

- to talk about my plans as I build.
- combine shapes and materials for effect.
- talk about the purpose of my projects.
- make improvements to what I build
- shape materials for different effects.
- join materials to make models.
- how to prepare some ingredients.
- how to stay safe in a kitchen or when preparing food.

Vocabulary:

strong, weak, tall, short, build, join, stick, cut, shape, picture, tools, cook, safe, fruit, vegetable.

I will experience:

- making designs with different materials and in different environments.
- helping to prepare food for others to try.

Learning Links

Children will build on the experiences of design technology they have already enjoyed in nursery or home settings.

Willow Lane DT Curriculum

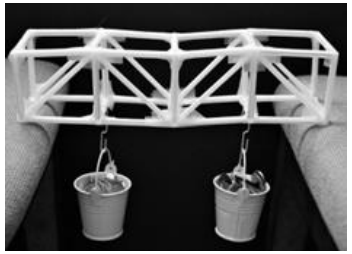
Year 1

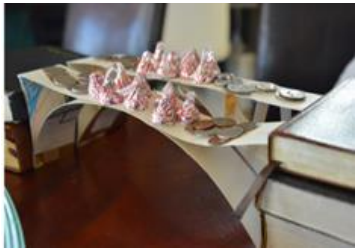
Willow Lane Community Primary School

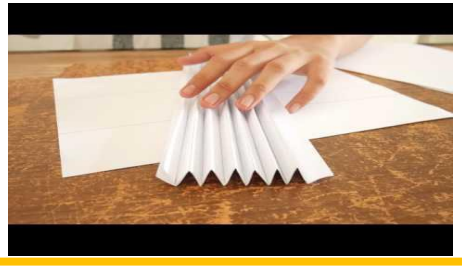
Year 1: Enhancements

Autumn

- paper straw bridges,
- newspaper bridges,
- Investigate wheels and axels
  – simple junk model car

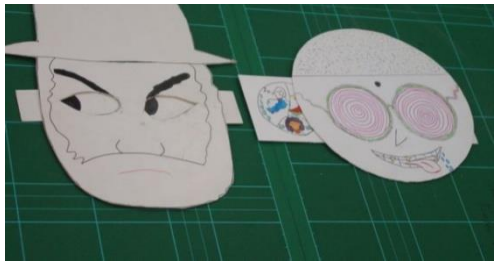




Spring:

- Make a face with moving parts e.g. mouth with split pins, eyes on sliders



Summer:

- mini-gardens,
- poly-tunnel for seedlings
- junk-model toy



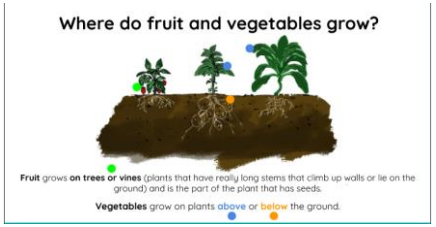
Willow Lane Community Primary School

Year 1: To make a fruit & veg smoothie with packaging

Enquiry Question: What does food give us?

Overview: This unit has strong links with science (healthy eating, plants and animals) Children will learn where food comes from, what healthy/unhealthy means. They will Learn about hygiene when handling food and safety when using tools to cut. They will evaluate existing products as well as their own.

Resources: fruit and veg, knives, graters, chopping boards, blenders, old (clean) bottles, labels**,**



National Curriculum

explore and evaluate a range of existing products
design purposeful, functional, appealing products for themselves and other users based on design criteria
select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]
use the basic principles of a healthy and varied diet to prepare dishes
understand where food comes from.

Year 1: To make a fruit & veg smoothie with packaging

I will know:

- What a fruit is
- What a vegetable is
- **Where food comes from**
- **What healthiness means**
- **What hygienic means**
- That Jamie Oliver is a TV Chef who has a certain style of cooking (iterative process) and campaigns to make children healthier

I will learn how to:

- Evaluate different tastes and textures
- Cut safely
- Be hygienic around food
- Operate a blender safely
- Evaluate products on how they taste and look

I will say:

Healthy – has things that the body needs
Nutrients – things our body needs
Vitamins – natural chemicals in fruit and vegetables
Energy – the property of being able to do things
Having good hygiene – minimizing the spread of germs

Learning check

1. What part of a plant did this food come from?
2. What would be the healthy choice?
3. How can you stop spreading germs when preparing food

I will experience:

- A range of smoothies bought from the shop

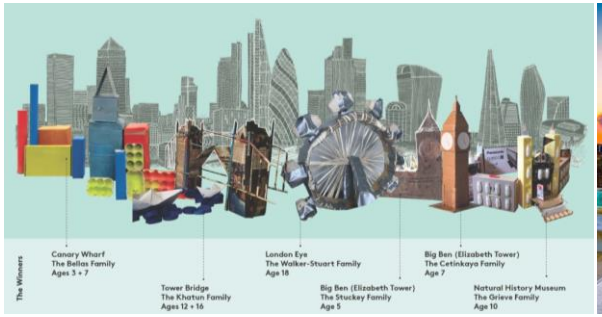
Learning links

In Red Class children looked after chicks and looked at farm animals so knew where some food comes from. They have also grown plants. Children regularly use the mud kitchen, home-corner and playdough for cooking related activities

Year 1: Make a mini-monument

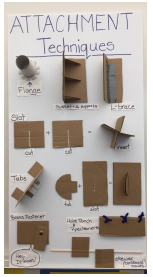
Enquiry Question: Why do some buildings look different to others?
Overview: This unit could draw links with the local area or further afield such as London, or Gaudi to make links with MFL. In this unit children will look at the function of buildings, what they are made from, and their structure. They will develop their joining techniques and evaluate and improve their work throughout the unit.
Resources: Various different boxes and tubs, tape, pva glue, glue gun, split pins, pipe cleaners. Material to finish products**.**












National Curriculum
Design purposeful, functional, appealing products for themselves and other users based on design criteria
select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]
explore and evaluate a range of existing products .
build structures, exploring how they can be made stronger, stiffer and more stable

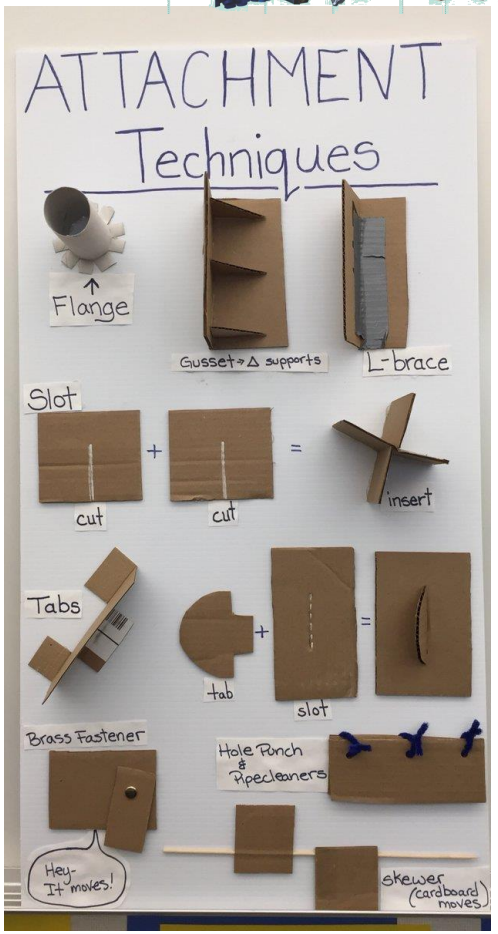
Year 1: Make a mini-monument

I will know:

- **that buildings need a strong structure.**
- **that buildings are made up of different shapes and materials for different purposes.**
- that triangles are a strong shape that can be used to add support.

I will learn how to:

- cut or bend material to create two faces to join.
- add material to strengthen.
- evaluate material in terms of its usefulness or appearance.
- join two pieces together to attach them securely.
- combine shapes to make a larger structure
- cut cardboard.
- **join objects together using tape and glue.**



I will say:

Purpose – what something is for
Material – 'stuff' used for building or making something
Properties – what something can do
Structure – the frame or skeleton of a building
Shape – a series of lines that join together to form a closed loop

Learning check

1. What shapes can you see in this building?
2. How could you join these two shapes together?
3. Why do buildings need a strong structure?

I will experience:

- local area walk to look at and sketch buildings.
- Visit a tourist attraction like Williamson Park, The Maritime Museum, Lancaster Castle.

Learning links

Children will have experience of exploring and using a wide range of materials from their time in Reception Class. They will have cut and stuck paper and card together for different purposes and talked about different shapes in their environment. They will have played together to build towers and structures from blocks.

Willow Lane DT Curriculum

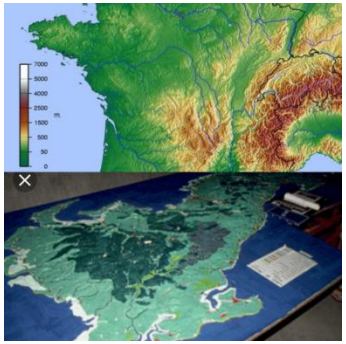
Year 2

Willow Lane Community Primary School

Year 2: Enhancements

Autumn

- make a model tourist attraction
- make a model town/area
- make a relief map



Spring:

- a slingshot rocket
- A landing capsule (NASA project)
- A crew module
- Colour mixer spinner

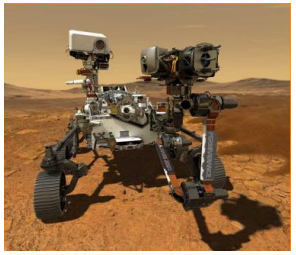
Summer:

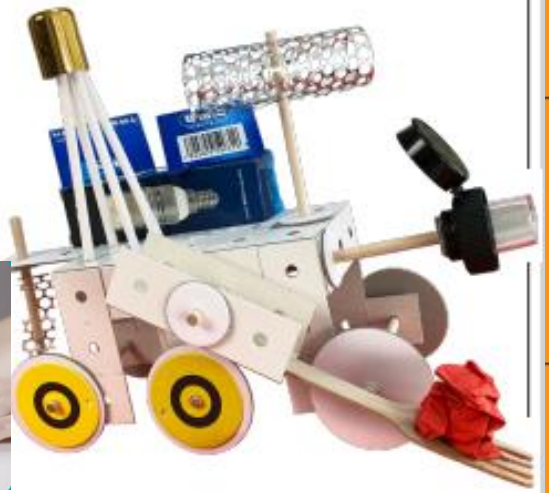
- Make a paper windmill
- fairground wheel
- bunting

Willow Lane Community Primary School

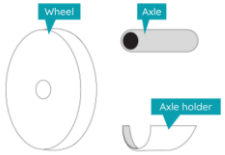
Year 2: To make an exploration vehicle

Enquiry Question: Why do people want to do difficult things? (like explore space?)
Overview: This unit links with science and through links with exploration in history and geography. Through the use of premade material, children can develop their junk modelling skills to create their own exploration vehicle. They will learn about the axels, wheels and pivots. There are three main designs to choose from and children can customize their design with features for an exploration vehicle.
Resources: techcard vehicle pack, saw, glue, additional junk modeling materials.

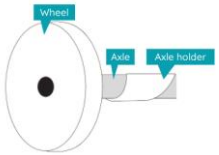


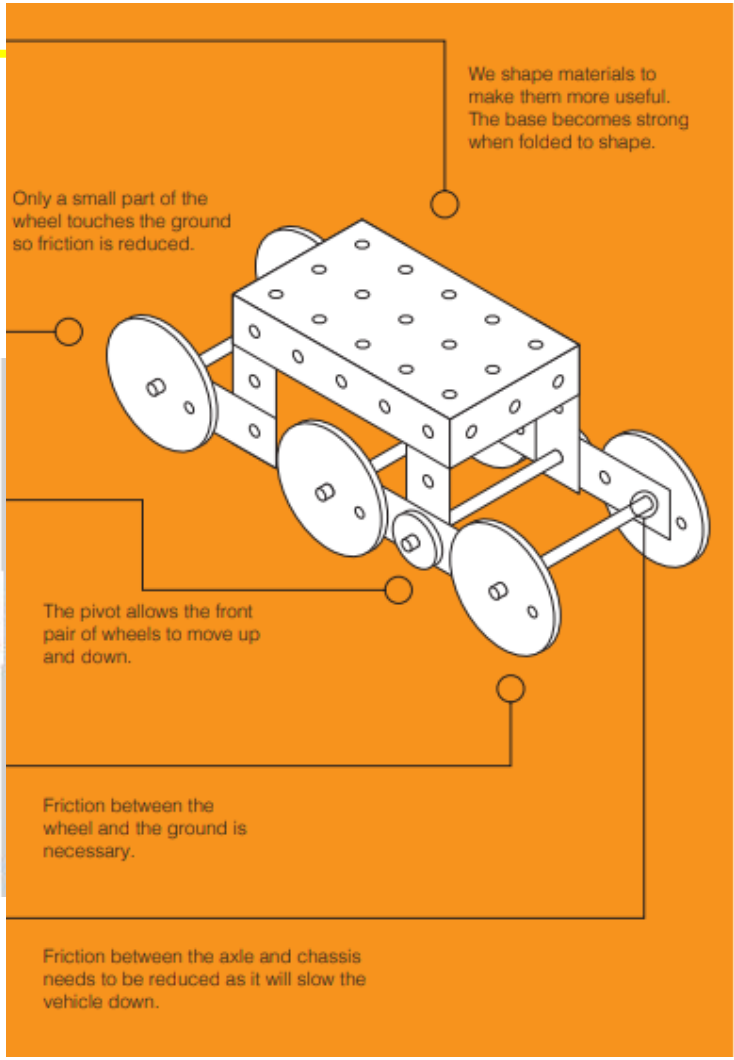


Wheel, axle and axle holder parts



Wheel, axle and axle holder assembled





National Curriculum
generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology
select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics
evaluate their ideas and products against design criteria
explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.

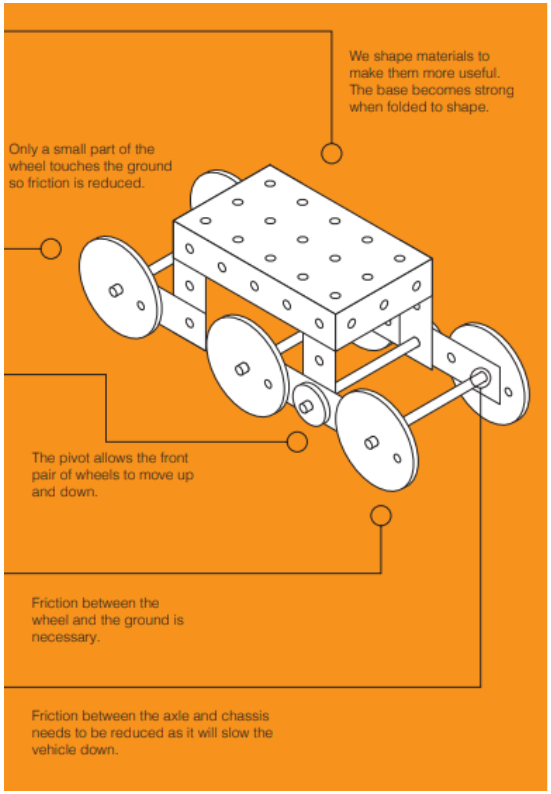
Year 2: To make an exploration vehicle

I will know:

- About a space agency such as NASA
- Significant engineers (Yvonne C. Brill) and explorers (Mae Jemison)
- What exploration vehicles need to do (e.g. take samples, send messages, take photos, recharge)
- **How wheels work, how they have developed and where you might find wheels in use**
- **How pivots and levers work and can name some examples of these.**

I will learn how to:

- Design a product with a specific purpose
- Use different mechanisms in their product
- saw a piece of doweling to the required length
- Add material to strengthen the structure



I will say:

Axel – a rod that rotates and connects to a wheel
Axel holder – something that holds an axel to a vehicle but allows the axel to move
Wheel – circular discs that rotate on an axel
Rotate – turn around on a fixed point
Pivot – a fixed point between two materials that allows the materials to move
Lever – a material that is attached to a pivot
Friction – the effect of two materials rubbing against each other

Learning check

1. What machines have wheels?
2. Where might you find pivots and levers?
3. How will your vehicle over-come the problem of x (e.g. bumpy planet surface)

I will experience:

- Exploring real-life wheels and axels – bikes, toy cars, remote control cars.

Learning links

Prior learning

Year 2: To make puppets for a show

Enquiry Question: How do puppets tell a story?
Overview: This unit links with history where children could look at puppet shows that are found at beaches, especially in the past e.g. Punch and Judy shows. It would also link with English to retell a story. Children will design and make their own puppet. They will learn some the basics of sewing and can also join material together using staples and glue.
Resources: Templates, felt, wool, needles, needle-threader, thimble, material to decorate











National Curriculum
generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology
select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics
evaluate their ideas and products against design criteria

Year 2: To make puppets for a show

I will know:

- **Sewing is a method of joining fabric**
- **how to use a needle and thread safely (use of a thimble)**
- How to use a template
- Different stitches can be used when sewing
- **It is important to tie a knot after sewing the final stitch**
- An important designer in textiles e.g. Coco Chanel, or Jim Henson and how they influenced fashion/puppetry

I will learn how to:

- Thread a needle
- Tie a knot
- Perform a regular and even running stitch
- Use stitches to join fabric together
- Decorate a puppet according to their design criteria
- Pin a template onto fabric to help with cutting
- Evaluate their own and others' work

I will say:

Sewing – a way of joining two types of fabric
Running stitch – a way of sewing
Fabric – a type of material that is often woven together and is flexible
Seam allowance – the space left between the stitch and the edge of the fabric so that the thread doesn't break out of the fabric
Template – the shape of the whole/part of an object
Regular-sized – the same or similar size
Knot – when material is wrapped around itself and pulls itself together

Learning check

1. How can we join fabric together?
2. Can you perform a running stitch?
3. Why do we need to tie a knot after we have sewn to pieces together?

I will experience:

- Using the puppets to perform a show/story

Learning links

Prior learning

Willow Lane DT Curriculum

Year 3

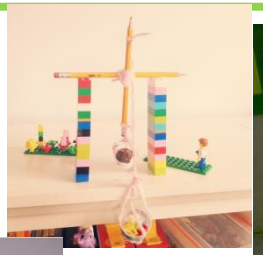
Willow Lane Community Primary School

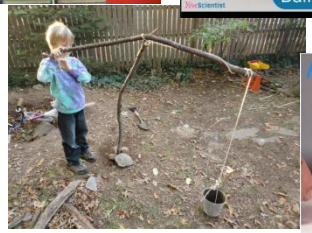
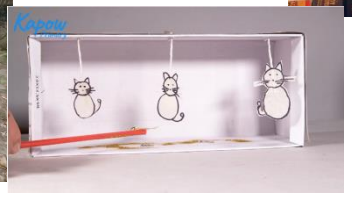
Year 3: Enhancements

Autumn

Make a story poster that uses magnets to move a character a long, Make a shadoof, electrostatic game, use blocks to make a pyramid





Spring:

mini houses from stone-age through to iron age
Explore pivots, pulleys in forest school

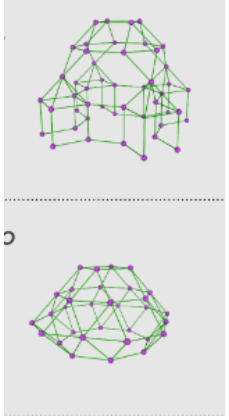






Summer:

Enhancements:
windowsill greenhouse
paper straw Eden dome





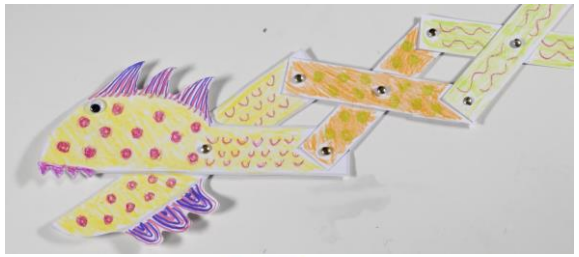

Willow Lane Community Primary School

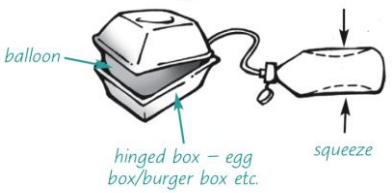
Year 3: Make a moving monster

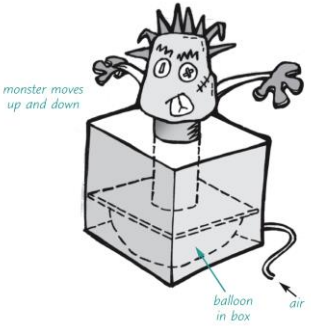
Enquiry Question: How can we make things move?

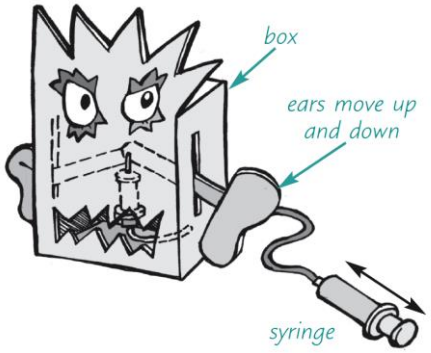
Overview: This unit links with English e.g. The monster in *The Iron Man*, and forces in science. It build on the skills the children learned in Year 2 when making a vehicle. Children can explore using levers, linkages and pivots to make a monster move and then progress to designing and making a monster that moves through a pneumatic mechanism.

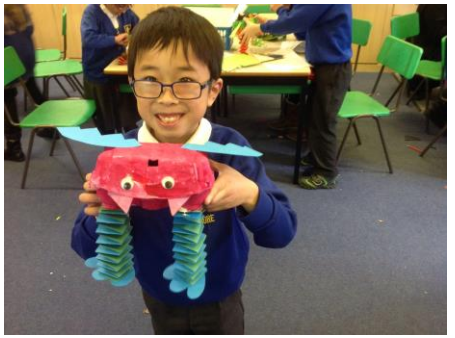
Resources: Syringes, tubes, connectors, balloons, boxes, materials to decorate











National Curriculum

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
select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately
investigate and analyse a range of existing products
understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]

Year 3: Make a moving monster

I will know:

- **That forces either push or pull**
- How hydraulics and pneumatics are used
- **Some everyday objects that use hydraulics or pneumatics**
- **How movement occurs when energy changes from one form to another** (e.g. potential energy of compressed air, kinetic energy of balloon filling up).

I will learn how to:

- how to develop my design from small thumbnail sketches to exploded diagrams
- Use a mechanical system to create movement
- Design a functional, appealing product

I will say:

Energy – having the property of making something work
Pneumatic – the energy within air to create movement
Housing – the outside structure that holds a mechanism
Mechanism – a system of parts that work together to create movement
Friction – the force of two materials pushing/pulling against each other

Learning check

1. How/why did x move?
2. How could we make an object move?
3. Where did the energy come from to make that happen?

I will experience:

- Look at pneumatics around the school

Learning links

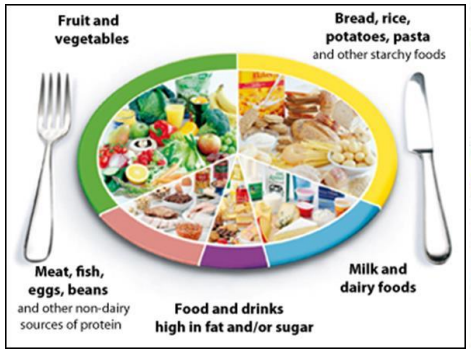
In year 1 children looked at energy in food. This is another example of how energy changes from one form to another
In year 2 children looked at having some mechanical systems in their exploration vehicle. This system allowed for movement and was where children first encountered the idea of friction

Year 3: Make a healthy picnic snack

Enquiry Question:

Overview: This unit links with science and what humans and animals need to survive and how to be healthy. It builds on the smoothie unit in Year 1. In this unit children explore existing healthy food snacks and evaluate their nutritional content. They taste different ingredients and make their own snack for a picnic. There are different options you could choose such as cereal bars, savoury healthy cookies, puff pastry wraps. There should be an element of cooking involved so children can also explore irreversible changes. Children could have a real picnic or even invite a local food seller to judge the snacks.

Resources: food snacks, ingredients, access to the kitchen, knives and chopping boards etc. Optional extras: make packaging for it.



National Curriculum

understand and apply the principles of a healthy and varied diet
prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques
understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed
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 materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities
evaluate their ideas and products against their own design criteria and consider the views of others to improve their work

Year 3: Make a healthy picnic snack

I will know:

- How using fire made food taste better
- Using heat allowed more nutrients to be extracted from food
- The advent of gas cookers made cooking easier
- **what type of foods make up a healthy diet**
- **How to cut and prepare food hygienically**
- How food changes when it is cooked (baked or grilled)
- **How some ingredients are grown, reared, caught and processed**.
- Some of the ways that Elizabeth David changed cooking in the UK

I will learn how to:

- Generate ideas based on evaluating food and my knowledge of a healthy diet
- Communicate my ideas through discussion, sketches, prototypes and exploded diagrams
- Choose ingredients according to their properties
- Evaluate my own and others' products based on the design criteria.
- Think of ways to improve my work

I will say:

Carbohydrates – a type of sugar that gives you energy
Protein – a bit like a chemical that helps muscles grow
Vitamins – a natural chemical made inside fruit and vegetables
Mineral – a substance formed in the earth (soil, rocks, water) but can be found in food.
Calcium – a mineral that is important for bone and teeth growth
Fat – a way of storing energy
Nutrition – the process of using the nutrients in food for living and growing

Learning check

1. What food groups are in this snack?
2. How is this nutritious?
3. How do you cut x safely and hygienically?
4. Look at an item of food – tell me the journey of some of the ingredients

I will experience:

- Ask and expert – visit from a local baker/ nutrionist

Learning links

In year 1 children looked at what healthy meant when making their smoothies. Children looked at the words, energy, nutrients, healthy, vitamins.
They combined ingredients to make a combination of flavours with one main texture

Willow Lane DT Curriculum

Year 4

Willow Lane Community Primary School

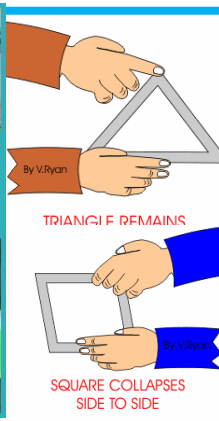
Year 4: Enhancements

Autumn

flood defences
aqueduct
make a recycled castle
Exploring strength of structures and shape

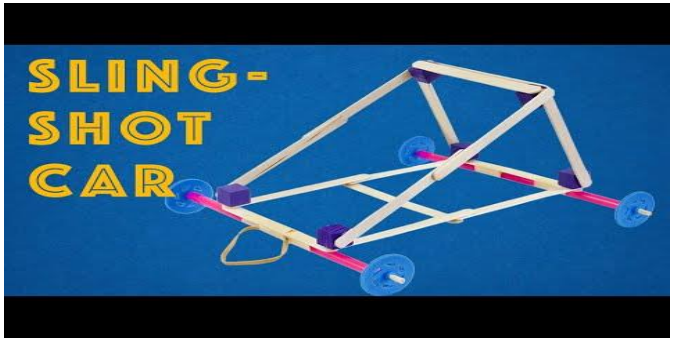


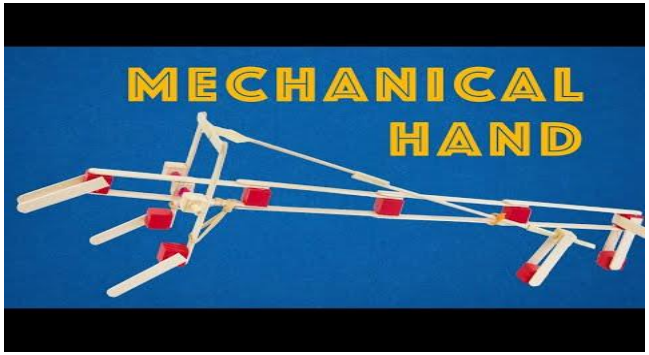


Spring:

Enhancements: slingshot car, pneumatic arm



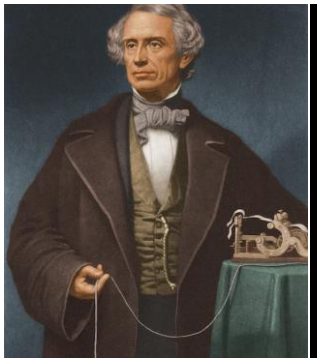


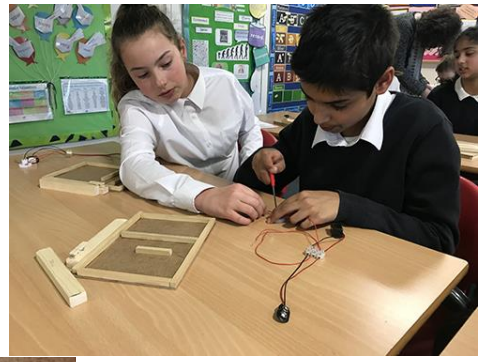
Summer:

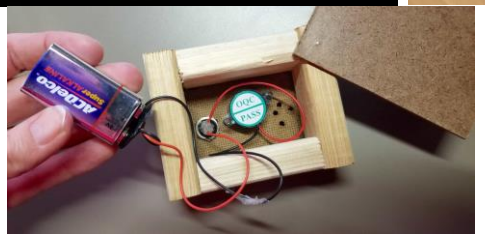
Willow Lane Community Primary School

Year 4: Make a Morse-code machine

Enquiry Question: How can you communicate over large distances?
Overview: This unit links with science (sound and light), history (industrial revolution) as well as future topics of migration (used in shipping e.g. Titanic) and wars (used in American civil war, WWI & WWII among many others), computing (codes and electrical communication systems). Sending messages is often a key dramatic ploy in many novels, so links could be made with English as well. Children will design and make their own Morse-code machine that has to transmit a message across the playground and be successfully translated and replied to.
Resources: Boxes (or children could make their own), wires, crocodile clips, buzzers, lights, batteries





National Curriculum
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]
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 their ideas and products against their own design criteria and consider the views of others to improve their work

Year 4: Make a Morse-code machine

I will know:

- **How communication systems have developed**
- Some key figures and events in the development of communication. E.g. order some forms of communication, know how our understanding of electricity has developed – match the scientist with the discovery.
- That Samuel Morse invented a code using electricity.
- How electrical systems are used in products

I will learn how to:

- **Use electrical systems in a product e.g. switches, bulbs, buzzers**
- Select from a range of materials and tools to make a product

- Evaluate my product against the success criteria and a real-life test

I will say:

Electric –works by giving off or using electricity
Electrical – having to do with electricity
Electricity – energy caused by the movement of electrons
Communication – sharing, exchanging of messages or ideas
Switch – apart of an electrical circuit that breaks/or completes it
Bulb – a part of a subject that heats up to produce light
Buzzer – a part of a circuit that vibrates to make a noise
Components – parts of a system

Learning check

1. what components do you need to make a complete circuit?
2. What ways do we have of communicating?
3. How could you make your machine more effective?
4. How have ways of communication changed?

Learning links

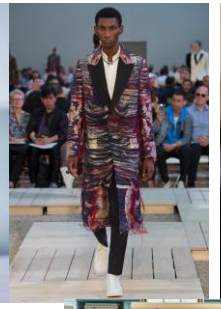
In year 3 Science – children learned about the quality of light
Communication systems such as computer networks and the internet

Year 4: Make a book cover

Enquiry Question: Should you judge a book by it's cover?

Overview: This unit would be a great time to inspire some fashion designers. It could link with migration in terms of a cover for something important when travelling e.g. a passport or a phone. It could also be a book cover for a child's favourite book or a book that they make about their topic. It builds on the running stitch which children learned in Year 2 by introducing two new techniques (cross stitch and appliqué) to add fastenings. These could be a button to keep it closed and decoration to reflect the owner or contents. Children will: 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.

Resources: fabric, needles, thread, needle-threaders,



National Curriculum

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 materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities

evaluate their ideas and products against their own design criteria and consider the views of others to improve their work

Willow Lane School

Year 4: Make a book cover

I will know:

- How fastenings have developed over time.
- **A fastening holds two pieces of material together**
- **Different types of fastenings are useful for different purposes**
- the features and benefits of a range of fastenings
- That creating a mock-up is useful for checking ideas and proportions
- How to use a template to make my design
- **How to use any stitch I am comfortable with for different purposes**
- A designer who has influenced the world (Vivienne Westwood)

I will learn how to:

- Use cross stitch and appliqué
- Write a design criteria for a product and explain the decisions made
- Design a personalised product
- Measure, mark and cut fabric using a paper template
- Use a stitch style to join fabric
- Incorporate a fastening to a design
- Evaluate success from the design criteria
- Suggests modifications for improvement
- Explain the advantages and disadvantages of different fastening types

I will say:

Cross-stitch – a stitch style that involves the thread crossing over itself

Applique – a way of joining a material onto another, usually for decoration or fastenings

Fastening – a way of joining to pieces of fabric together that can be undone by the user

Learning check

1. How can we join an item to a piece of fabric?
2. Why does a clothing item have fastening?
3. Can you join these two pieces of fabric together?

I will experience:

- Possible visit from a local artist who uses textiles

Learning links

In year 2 children learnt the running stitch. The new stitches introduced are a variation on this.

Children also learnt how to thread a needle and to tie a knot, but this will need revisiting.

Children have learnt about decoration for a purpose when making a moving monster, and when making a puppet.

Willow Lane DT Curriculum

Year 5

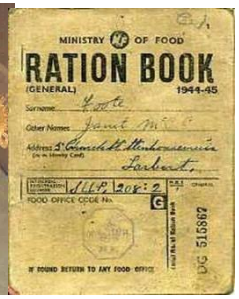
Willow Lane Community Primary School

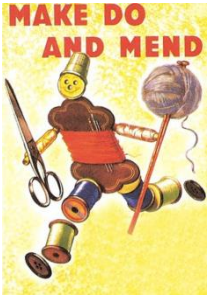
Year 5: Enhancements

Autumn

Wartime rations – what could you make?

Make-do and mend project

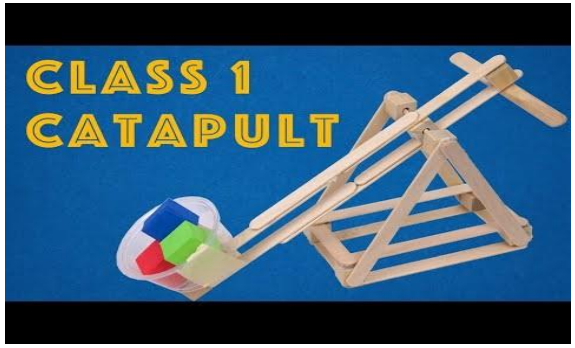


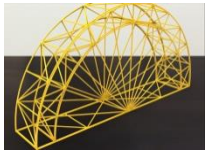


Spring:

catapult, bridges

pavilion temple



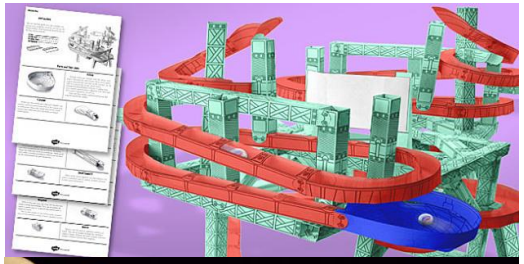


Summer:

Willow Lane Community Primary School

Year 5: Make a marble run

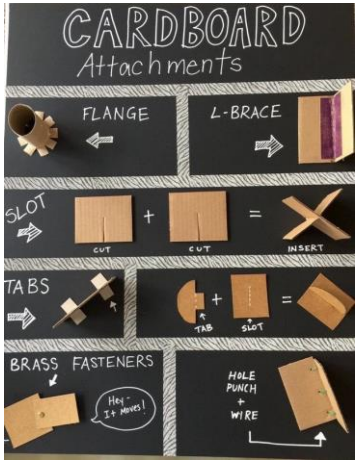
Enquiry Question: How can you control how the objects fall?
Overview: This unit links primarily with science (gravity – the funnel part of these marble runs is a good visual example of how the gravitational field works) but could also be linked with Ancient Greece i.e. the maze in the Perseus story. In this unit children will explore existing marble runs and evaluate them. The funnel is a particular Children will work in groups to design and make their own marble run. It will end up as a large structure so this unit would work best as one block. Children will need to revisit and develop their knowledge of ways structures can be reinforced and materials can be joined. Children can select from a range of materials to suit their purpose e.g. paper, card, doweling, paper straws, tubes. Children could be challenged further by having some moving parts i.e. spinners or parts of the track that pivot.
Resources: marble runs, selection of materials to shape the run, additional boxes and tubes to help build the structure.











National Curriculum
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
investigate and analyse a range of existing products
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 their ideas and products against their own design criteria and consider the views of others to improve their work
apply their understanding of how to strengthen, stiffen and reinforce more complex structures

Year 5: Make a marble run

I will know:

- How to use the properties of different materials for different purposes
- How products are designed to appeal to particular groups
- I will know that Sir Isaac Newton discovered 'the universal law of gravity' and the 'three laws of motion', which, still underpin much of physical engineering and the study of physics
- How to explain or demonstrate what some of these laws mean.
- **An architect (Zaha Hadid) who has influenced the world of structural design, and can identify some common features of her buildings.**

I will learn how to:

- design a product that is aimed at a particular group (e.g. Wet play time toy for key stage 1 children)
- **Join objects together in a wide variety of ways**
- Work in a group to develop criteria and design ideas
- Evaluate our own and other products.
- **Strengthen, stiffen and reinforce more complex structures**

I will say:

Structure – the overall object or building
Frame – the parts of the structure which support it
Strengthen – make stronger
Stiffen – make more flexible
Flexible – capable of bending (pliable, malleable, supple)
Reinforce – additional materials to add strength and support

Learning check

1. How can you join two pieces of cardboard together?
2. How can you make a structure stronger?
3. How can you tell that this is Zaha Hadid building?

I will experience:

Learning links

In year 1 children learnt some ways of attaching materials and fixing materials. In year 2 children learnt about axels and wheels, which could also be utilised here. Also in year 2, and in year 3 and 4, children made structures to house their mechanical systems. Children have learnt about the advantages and disadvantages of different ways of joining, how triangles are an important shape in construction and pieces are often connected at right angles for added support.

Year 5: Make a healthy meal

Enquiry Question: What is better than healthy?

Overview: This unit links to both science (animal development, lifecycles) and geography (habitat protection). Children will learn about some of the 'mother sauces' and how they can be adapted to make a meal. E.g. spaghetti bolognaise, tarte spaghetti, ratatouille. Children will develop their understanding of a healthy and varied diet. They will make a savoury dish using a range of techniques (e.g. melting, boiling, grilling, roasting). They will understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed. This unit would probably work best with the final outcome being conducted in small groups in the kitchen. The kitchen staff could be used as judges, with a potential prize of being on the school menu.

Resources: ideally ingredients from the allotments, cooking equipment, use of the kitchen. Very well fit nutrition calculator (internet app)

National Curriculum

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 their ideas and products against their own design criteria and consider the views of others to improve their work
understand and apply the principles of a healthy and varied diet
prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques
understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed

Year 5: Make a healthy meal

I will know:

- **The ingredients of a basic sauce**
- How to adapt a recipe
- How to plan my ingredients because of their nutritional value and taste
- **How foods are in season at different times**
- How a variety of ingredients are grown, reared, caught and processed
- An individual who has changed the world (Guy Singh-Watson, founder of an organic, locally sourced food delivery service)

I will learn how to:

- handle food hygienically
- Cut and prepare food safely
- **Cook food using different techniques (boiling, melting, roasting, grilling, frying)**

I will say:

Seasonality – when different fruit and vegetables can be harvested
Processed – how food is made ready to eat
Nutrition and the main food groups (see year 3)
Melt – to change from a solid to a liquid
Names of sauces e.g. béchamel, tomate, espangolé

Learning check

1. What ingredients are in a tomato sauce?
2. What foods are in season now? Or in the next season?
3. Look at some food products – what ways could they be cooked?

I will experience:

Sharing a health meal together and trying other healthy meals.

Learning links

In year 1 children learnt about healthy food, and combined ingredients to make a smoothie. In year 3 children were introduced to additional cooking techniques and combined a wider range of ingredients.

Willow Lane DT Curriculum

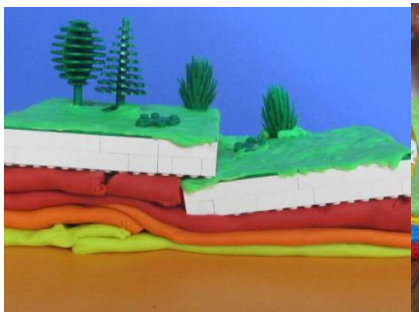
Year 6

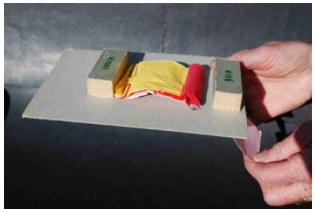
Willow Lane Community Primary School

Year 6: Enhancements

Autumn
make an adventure map for a beebot

Spring:
earth's crust model (with balloons with air or water in as the moving layers underneath the plates, or with some other push pull mechanism)





Summer:

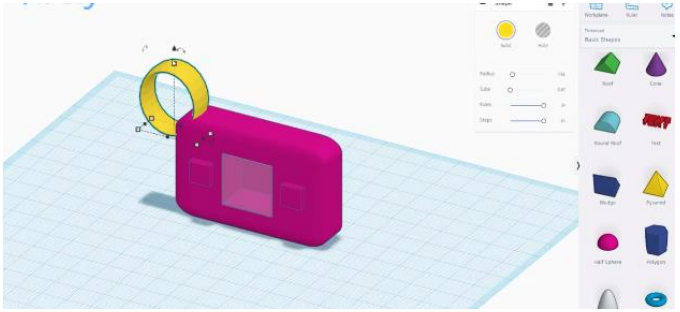
Willow Lane Community Primary School

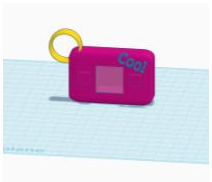
Year 6: Design a device to monitor your location

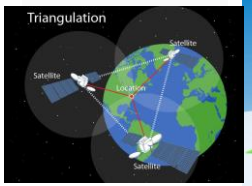
Enquiry Question:

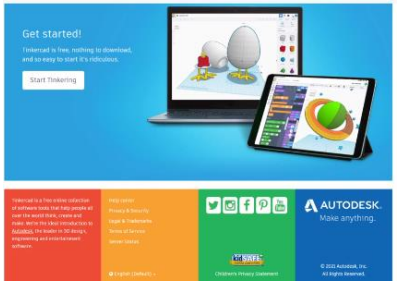
Overview: Some links can be made with this unit and others, such as climate change and sustainability. In this unit, children program a navigation tool to produce a multifunctional device for trekkers. They will design and prototype a model. They will learn about sustainable design during this process. They combine 3D objects to form a complete product in CAD 3D modelling software. The unit accumulates with a pitch to share and 'sell' the children's final product concepts and programs to a panel such as a sports shop in Lancaster, or the Adventure Awaits Company.

Resources: Tinkercad, laptops (with mice)A3 paper, card



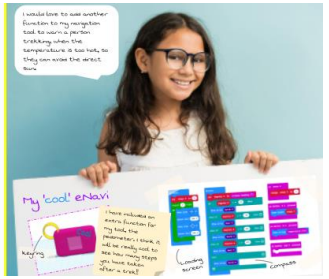






Poster

1. Screenshots of the program and 3D model.
2. Labels to key features and functions of the model and program.
3. Information to convince Adventure Awaits Co. to purchase the product.
4. Think about future plans for your product.



National Curriculum

apply their understanding of computing to program, monitor and control their products.

generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

evaluate their ideas and products against their own design criteria and consider the views of others to improve their work

Year 6: Design a device to monitor your location

I will know:

- **About some key inventions that have helped people navigate the world.**
- What sustainable material means
- **How to use a computer to aide my design**
- How computing has developed over time and some key individuals in this process (Ada Lovelace and Dr Mark Dean)
- **How communication systems have developed and some key individuals in this process (Hedy Lamarr and possibly Isaac Asimov as well)**

I will learn how to:

- Generate, develop and communicate ideas through discussion, annotated sketches, cross-sectional and computer aided design
- Present ideas in an engaging way
- Evaluate ideas and products against a success criteria
- Suggest improvements for their own and others' work

I will say:

Navigate – to find your way around
Sustainable – a way of using and replenishing/reusing/recycling the material
Vocab related to Tinkercad app
Triangulate: using the properties of triangles to work out an unknown position.

Learning check

1. How have people travelled round the world?
2. Why might you choose to design something on a computer?
3. Who has been important in developing communication systems?
4. How will my product fit its purpose?
5. Why should they pick my product?

I will experience:

- Visits and experiences

Learning links

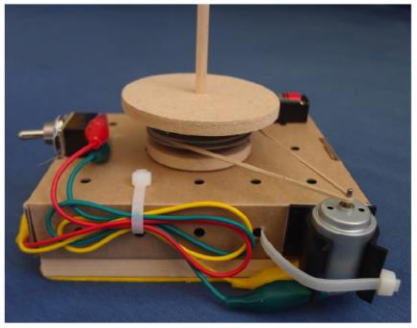
In all the previous year groups children have designed for a specific purpose. This learning builds on that and allows children to create an object that is beyond their capabilities through the use of technology.

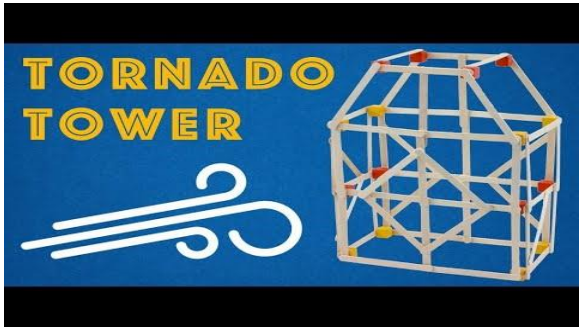
Year 6: Design and make an eco-product for the summer fair

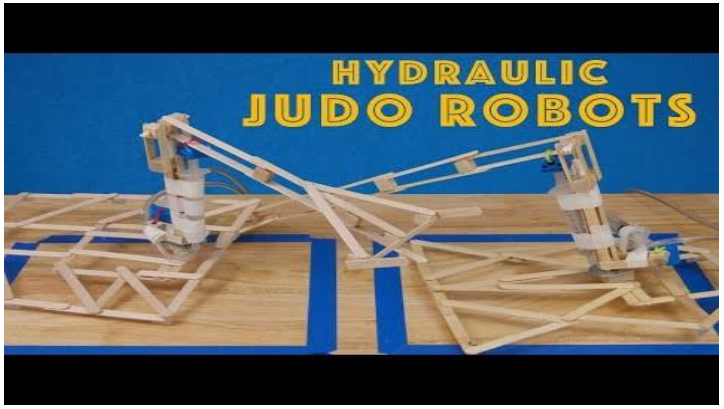
Enquiry Question: What makes a product ethical

Overview: In this unit children learn about different elements of 'ethical' goods i.e. fair trade, organic, locally sourced, sustainable. Children have a mission to design something that could earn money at the Summer Fair. Children would explore different options such as an organic cotton or upcycled tote bag/stuffed toy, a game that children could play on such as which car would win a race, a steady hand game, pneumatic judo arm game, can you knock down a tower challenge, make a far ground ride spin a certain number of times. Children should be guided to a choice that uses a range of DT skills such as electricity, sewing, construction. Children should evaluate their design as they go. The final evaluation is at the summer fair by the school community.

Resources: A range of materials and tools to choose from.







National Curriculum

generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided
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 their ideas and products against their own design criteria and consider the views of others to improve their work
understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
apply their understanding of how to strengthen, stiffen and reinforce more complex structures
understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]

Year 6: Design and make an eco-product for the summer fair

I will know:

- **what ethical means**
- How to design a product that meets the needs of specific individuals or groups
- **How to use my DT skills from other units to design and create a product.**
- How to research different ideas to form my developing concepts
- Know an individual or has created unique and popular products (Steve Jobs)
- **Know that Steve Jobs made sure products were accessible, easy to use, functional and aesthetically pleasing.**

I will say:

Ethics – the problems and issues of how you live your life
Ethical – something that reduces problems and issues for people's lives
Greenwash – when companies or institutions pretend to be more ethical or eco-conscious than they are
Fair-trade – an agreement to pay the farmers in developing countries a fair price
Organic – made without the use of artificial fertilizers, pesticides and other chemicals
Locally sourced – made in an area near by
Renewably sourced – made from materials which are grown back again

I will experience:

- Visit from outreach work from 'Engineers without borders' from Lancaster University

I will learn how to: *(children have some freedom in this task so not all of these skills will necessarily be covered by the whole class).*

- generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes.
- select and use a range of materials appropriate to their function and appeal.
- evaluate their ideas and products against their own design criteria and consider the views of others to improve their work
- understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]
- apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]

Learning check

1. What does ethical mean?
2. What tools did you use to make your product?
3. How have your ideas changed from your start point to your end point?
4. What are the advantages/disadvantages of your product over others?
5. Who founded the apple company? Why are they popular?

Learning links

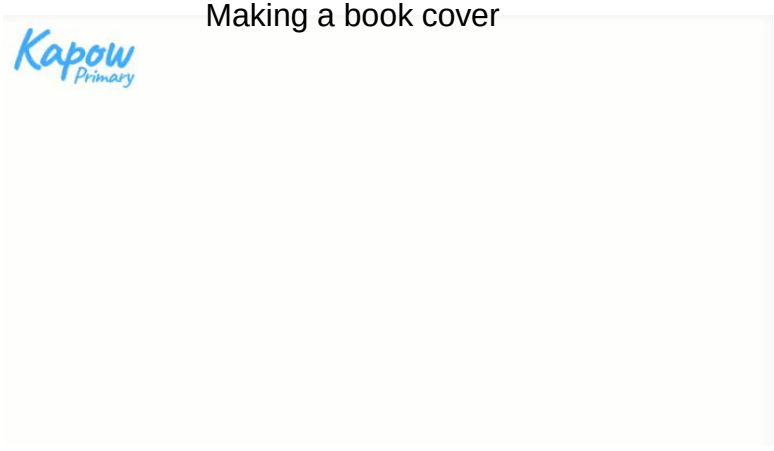
This unit potentially builds on all previous units as children could use a range of conceptual and procedural knowledge to complete this task.

Sewing support

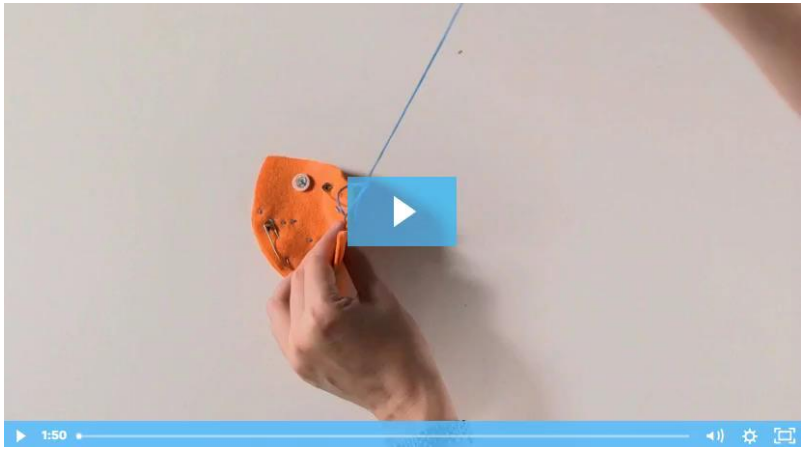
Running stitch

Cross stitch and appliqué

Making a book cover



Blanket stitch



Mechanism support

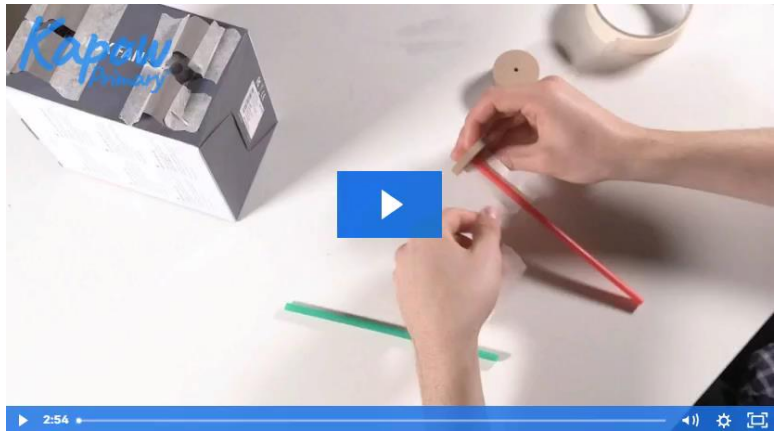
What do wheels do?

Wheels and axels

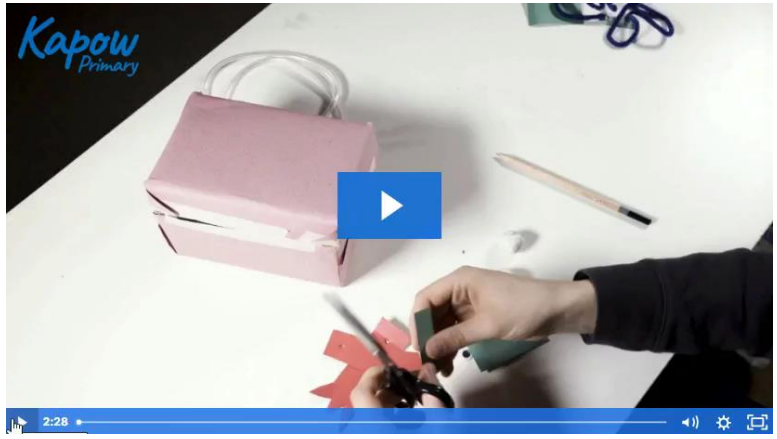
Pneumatics and hydraulics

How do wheels work?

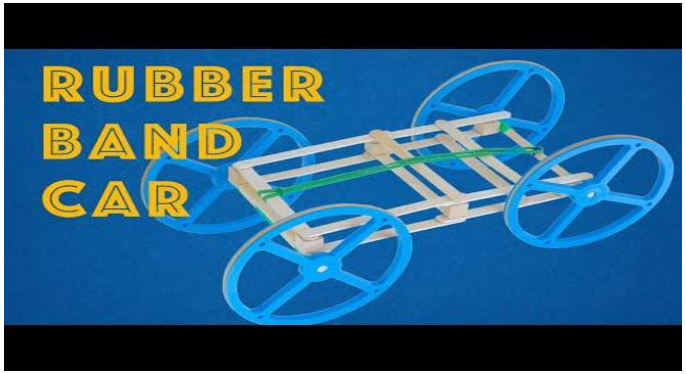
Wheels and axels making a car

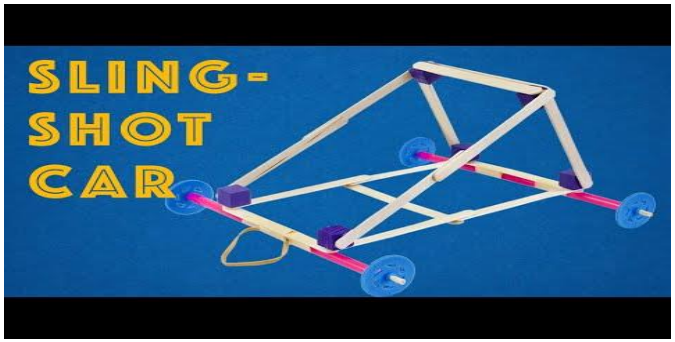


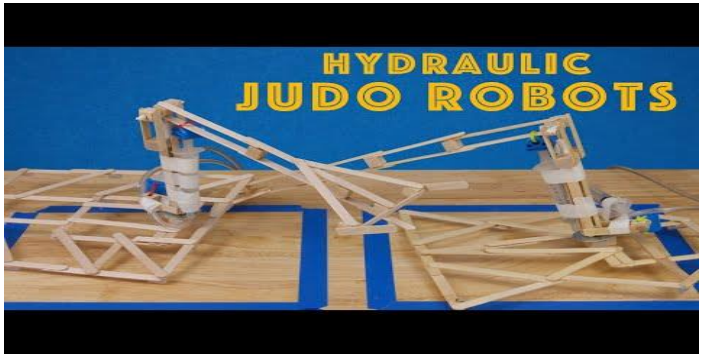
Making a moving monster

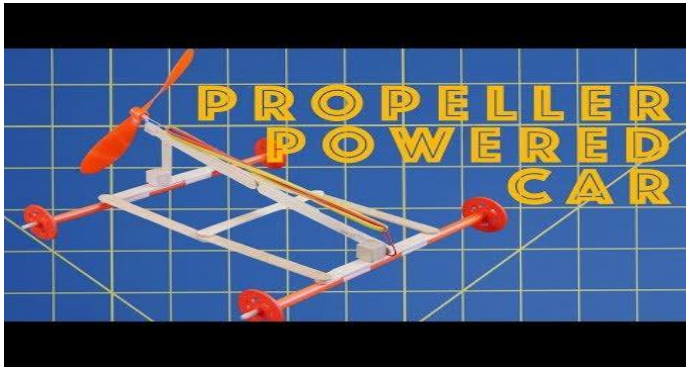


Mechanism support







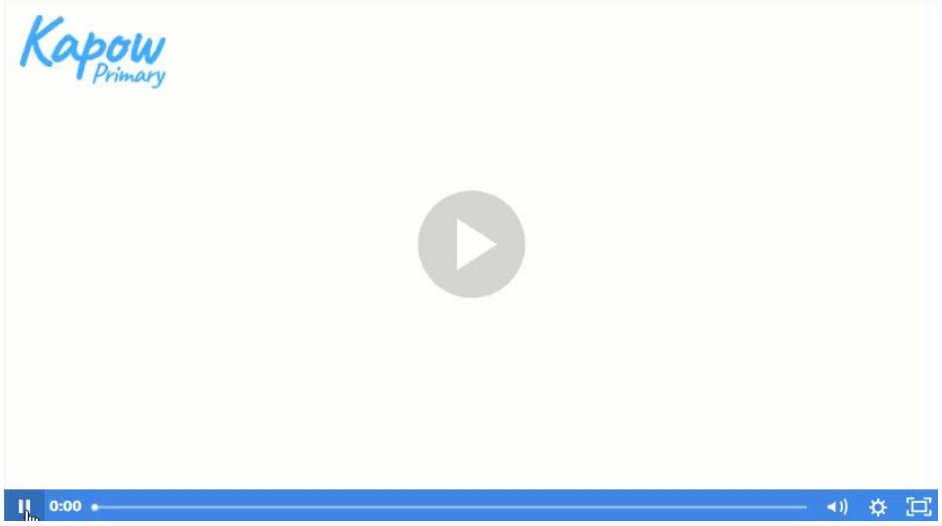


'Young engineers'
https://www.stem-inventions.com/

Electrical support

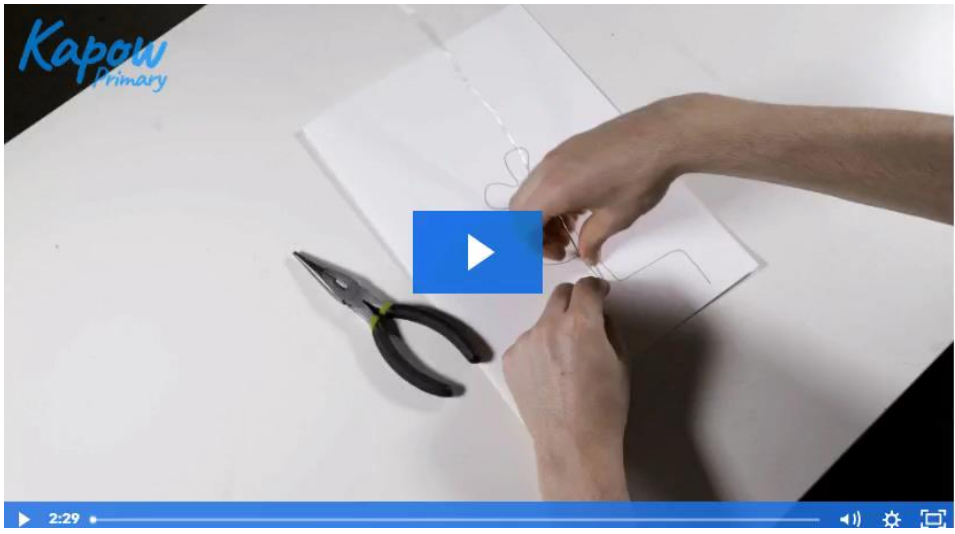
Simple circuit with light

Torch



Steady-hand: base

Steady-hand: game



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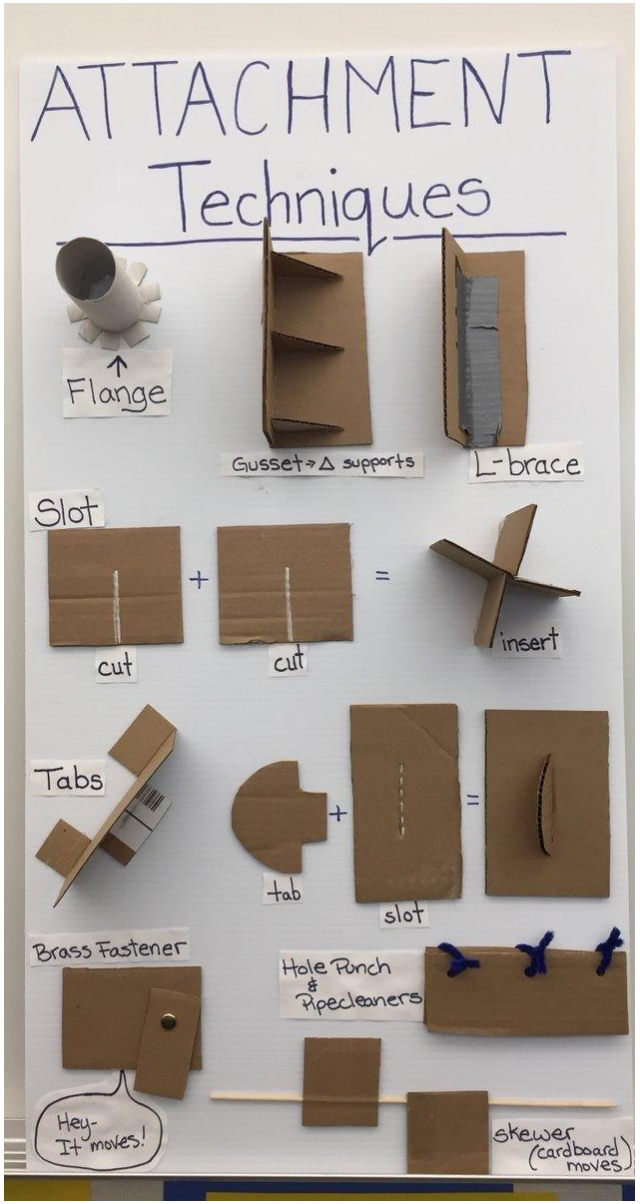

- Knowledge appendix
- PowerPoints for biographies
- Folder for helpful videos and resources
- Gardening curriculum
- Forest School curriculum
- Lancaster Grammar school for help with:

apply their understanding of computing to program, monitor and control their products.