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Design and Technology at Hayes: Subject Story

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The Hayes Curriculum Vision Statement

At Hayes, we strive for our children to push beyond any perceived idea of potential, to be all they can be, regardless of their background. Our vision is for all of our children to leave us as good human beings- happy, kind and responsible. Our curriculum is integral in shaping the children to become independent and life-long learners. Our curriculum aims to equip our children with the ability to 'think' in order to make sense of an ever-changing world. The breadth our curriculum provides is underpinned by thinking. This thinking will allow our children to make sense of the world around them and before them in order that they can live fulfilling and happy lives, being all they can be.

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Intent: Design and Technology

Design and technology is a practical and valuable subject where children are taught how to contribute to the creativity, culture, and well-being of themselves and their community. Here at Hayes we will ensure that children understand the impact DT has in today's modern society, as well as encourage and provide a safe environment for the children to learn how to take risks, becoming more resourceful (especially environmentally), innovative, enterprising and capable.

The curriculum of Design and Technology at Hayes reflects our local setting. We aim for the children to become familiar with designers, chefs and engineers, both past and present, as well as ensure the children understand the impact these designers have had within their community and how their work has impacted the world that they live in today.

We will influence children to identify how they can combine practical skills with an understanding of aesthetic, social and environmental issues, as well as functions and industry.

Children will be consistently encouraged to think about their initial designs, material choices and final products to evaluate and celebrate success and possible development points. Children will be taught to be reflective and creative problem solvers both individually as well as collaboratively.

Each year group will follow the specific skills required for that age range and will plan an innovative, cross-curricular element to inspire children in the area of Design Technology projects.

The National Curriculum for Design and Technology aims to ensure that all pupils:

- Have and inclusive learning for all
- Collaboration and teamwork
- All children engaged and inspired in a wide range of cross-curricular tasks and projects
- Individuality, child led learning
- Reflecting school values.

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Implementation: Design and Technology

- Design and Technology across the school follows the National Curriculum through projects on a page. These are purposeful planners that ensure that progression is achieved across the year groups.
- Design and technology will be taught through cross-curricular links, such as Science, Maths, and Topic, to make it relevant and purposeful.
- Our focus is on the progression of DT; food technology, textiles, electronics, mechanisms is consistently implemented and revisited across the school.
- As children move up the school, we ensure we build upon existing knowledge and skills whilst consistently inspiring children with the ever changing possibilities of the design world.
- Teachers will sequence lessons and carefully resource projects and experiences so that design and Technology will innovate children's creativity and allow them to recognise 'design' in the world around them.
- Children will be presented with opportunities to design and make products that solve real, relevant problems within a variety of contexts.
- Teachers' will teach design and technology as an inspiring, rigorous and practical subject, requiring creativity, perseverance, and imagination.

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Impact of our design and technology provision

<u>If you walk in on a design and technology lesson, you would see:</u>

- Children are taught to use and select a wide range of tools which positively impacts their learning and skills in Design and Technology.
- Children are being given opportunities to work together and independently on designing, constructing and evaluating their projects.
- Relating it to cross-curricular links, or the ever changing ‘design’ world around us provides children with a purpose that can be applied outside the classroom and taken into future dreams and aspirations**.**

<u>Our destination as *Designers* at Hayes will be:</u>

- Inclusive learning.
- Collaboration and varied discussions during the planning and evaluation process.
- Individuality in designs and creations.
- Children are challenged to be all they can be.
- Opportunities to experiment and take risks during the sequence of lessons.

- Learners develop detailed knowledge and skills , and as a result achieve well.
- Learners are ready for the next stage of their education
- Learners gain the confidence to try out new ideas.
- Learners gain knowledge by assessing and adjusting their designs

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What is Design and Technology? EYFS & KS1

Our intent is that children understand the definition of each subject. What is design and technology?

Teachers regularly quiz the children with this question to ensure the understanding of the subject discipline.

Remote control cars - Nursery

When you think about how you want things to look - Reception

When we make things like bridges - Charlie Year 2

Technology is using things like ipads - Reception

When you design stuff - Indie Year 2

Drawing models - Nursery

Making things by cutting and sticking - Reception

Making models from materials - Year 2

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What is Design and Technology? LKS2

Our intent is that children understand the definition of each subject. What is design and technology?

Teachers regularly quiz the children with this question to ensure the understanding of the subject discipline.

Designing and researching - Year 3

Design and technology is important because it could help you with your job in the future - Year 4

To learn the structural base of an electrical appliance to make life easier - Year 4

Building stuff - Year 3

Computer aided design - Year 3

Something that you can't life without - Year 4

When you design and make an item, that makes life easier - Year 4

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What is Design and Technology? UKS2

Our intent is that children understand the definition of each subject. What is design and technology?

Teachers regularly quiz the children with this question to ensure the understanding of the subject discipline.

It is when you design and then make a model - Year 5

Design and create things, sometimes using technology - Year 6

Researching, designing, making and then evaluating - Year 6

It is when you make something for a problem - Year 5

When you design something new, that hasn't been made before - Year 6

Research, create a design and then evaluate - Year 6

Design and technology is where you use creativity to design something new - Year 5

Plan, make, evaluate - Year 6

It is planning, making and evaluating an item - Year 6

It is textiles, food, structures and mechanisms - Year 6

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Removing Barriers to the Design Technology Curriculum for Hayes Children

At Hayes, we strive to ensure that all children access the Design and Technology curriculum and that they are supported effectively in order that they succeed.
Therefore, the following are steps taken to remove barriers for Hayes pupils:

- Clear explanations, using an appropriate level of language.
- Concrete examples, linked to previous learning. Teachers' will ensure that the retrieval process is robust, thereby supporting children to make links in their learning.
- Visual input and prompts. Use of subject specific vocabulary triangles and word banks.
- Providing easy -to -use videos and adapted/modified resources, tools and equipment.
- Learning through practical activities with adapted tools, allowing a range of recording techniques for ideas and plans.
- Checking understanding - careful questioning, asking children to explain to their peers for support (ELF).
- Being resilient - having the opportunity to go over something for a second, third or fourth time - perhaps with an adult supporting.
- Referring to IEP's to ensure that learning is matched to need and necessary scaffolds are in place accordingly.
- Allowing TIME for thinking, talking and practising before asking children to respond verbally or practically.
- Recognising individuality and talking about it with the child. Tasks or products can be adapted or modified to include this.
- Working in smaller groups.
- Offering examples of what they could do, sometimes giving options 'this or this'.
- Use of SEND support and adaptations from POAP.

Projects on a page sample

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3. Key learning in design and technology

Prior learning

- Explored simple mechanisms, such as sliders and levers, and simple structures.
- Learnt how materials can be joined to allow movement.
- Joined and combined materials using simple tools and techniques.

2. Aspect of D&T

Mechanical systems

Focus

Pneumatics

4. What could children design, make and evaluate?

tipper truck | jack-in-the-box | class display | moving creature | shop window display | moving toy | other – specify

5. Intended users

themselves | peers | younger children | older children | shoppers | visitor to school | other – specify

6. Purpose of products

celebration event | information | educational play | advertising | interests and hobbies | campaign | other – specify

7. Links to topics/themes

Toys and Games | Our Community | Forces and Movement | Mini-enterprise | other – specify

8. Possible contexts

shop | home | school | leisure | culture | enterprise | environment | local community | other – specify

9. Project title

Design, make and evaluate a _____ (product) for _____ (user) for _____ (purpose).

To be completed by the teacher. Use the project title to set the scene for children's learning prior to activities in 10, 12 and 14.

16. Possible resources

examples of products and books, photos and videos showing pneumatic systems

washing-up liquid bottles, 5mm plastic tubing, sterile syringes, T-connectors, balloons

card, plastic sheet, PVA glue, masking tape, parcel tape, sticky pads, pipe cleaners, elastic bands, syringe clips,

left/right handed scissors, snips, card drills, cutting mats, hole punches, finishing media and materials

17. Key vocabulary

components, fixing, attaching, tubing, syringe, plunger, split pin, paper fastener

pneumatic system, input movement, process, output movement, control, compression, pressure, inflate, deflate, pump, seal, air-tight

linear, rotary, oscillating, reciprocating

user, purpose, function, prototype, design criteria, innovative, appealing, design brief, research, evaluate, ideas, constraints, investigate

3. Key learning in design and technology

Prior learning

- Explored simple mechanisms, such as sliders and levers, and simple structures.
- Learnt how materials can be joined to allow movement.
- Joined and combined materials using simple tools and techniques.

Designing

- Generate realistic and appropriate ideas and their own design criteria through discussion, focusing on the needs of the user.
- Use annotated sketches and prototypes to develop, model and communicate ideas.

Making

- Order the main stages of making.
- Select from and use appropriate tools with some accuracy to cut and join materials and components such as tubing, syringes and balloons.
- Select from and use finishing techniques suitable for the product they are creating.

Evaluating

- Investigate and analyse books, videos and products with pneumatic mechanisms.
- Evaluate their own products and ideas against criteria and user needs, as they design and make.

Technical knowledge and understanding

- Understand and use pneumatic mechanisms.
- Know and use technical vocabulary relevant to the project.

10. Investigative and Evaluative Activities (IEAs)

- Children investigate, analyse and evaluate familiar objects that use air to make them work e.g. bicycle pump, balloon, inflatable swimming aids, foot pump for inflating an air bed. *What does the air do? How has it been used in the design of these products? How can air be used to move heavy objects?*
- Construct a simple pneumatic system by joining a balloon to 5mm tubing and then to a washing-up liquid bottle. *What happens to the air when you squeeze the bottle? What happens when you let go? Can you lift a soft toy or a note pad using a balloon?*
- Demonstrate lifting an object and ask the children to think about ways in which this might be used in a product. *Who might it be for? What is its purpose? What part moved and how did it move? What materials have been used? How effective do you think it is and why? What else could move?*
- Demonstrate a range of pneumatic mechanisms using prepared teaching aids including two syringes joined by plastic tubing; three syringes connected using a T-connector and using different sized syringes. Ask the children: *What happens when the plunger of one syringe is pressed in? Why do the syringes move at different speeds?* Note: take care as the syringe may come out with force. Discuss why, when pressing a large syringe, it can take time and feel 'squishy' before the smaller syringe is moved.

11. Related learning in other subjects

- **Spoken language** – participate in discussion and evaluation of examples of products that use pneumatics. Ask relevant questions to extend knowledge and understanding. Build technical vocabulary.
- **Science** – identify and compare the suitability of a variety of everyday materials for particular uses.

12. Focused Tasks (FTs)

- Demonstrate how to assemble the systems using syringes, tubing, balloons and plastic bottles. Introduce ways in which pneumatic systems can be used to operate levers.
- Demonstrate the correct and accurate use of measuring, marking out, cutting, joining and finishing skills and techniques.
- Provide the materials and ask the children to try out and draw the three systems they have been shown: a) Balloon connected to a washing-up liquid bottle. *What happens when you squeeze the bottle? What happens when you let go?* b) Two syringes of the same size connected together. *What happens when you press the plunger of one syringe down? How far does the other syringe move?* c) Two syringes of different sizes connected together. *How far do these syringes move when pressed?* Note: take care as the syringe may come out with force.

13. Related learning in other subjects

- **Spoken language** – ask relevant questions to extend knowledge and understanding.
- **Mathematics** – measure, compare, add and subtract: lengths, volume and capacity.

14. Design, Make and Evaluate Assignment (DMEA)

- Develop a design brief with the children within a context which is authentic and meaningful.
- Discuss with children the purpose of the products they will be designing and making and who the products will be for. Ask the children to generate a range of ideas, encouraging creative responses. Agree on design criteria that can be used to guide the development and evaluation of the children's products.
- Using annotated sketches and prototypes, ask the children to develop, model and communicate their ideas.
- Ask the children to consider the main stages in making before assembling high quality products, drawing on the knowledge, understanding and skills learnt through IEAs and FTs.
- Evaluate the final products against the intended purpose and with the intended user, where safe and practical, drawing on the design criteria previously agreed.

15. Related learning in other subjects

- **Spoken language** – ask relevant questions to extend knowledge and understanding. Build technical vocabulary. Consider and evaluate different viewpoints.
- **Art and design** – use and develop drawing techniques. Use colour, pattern, line, shape.
- **Science** – when evaluating, make systematic and careful observations and take accurate measurements.

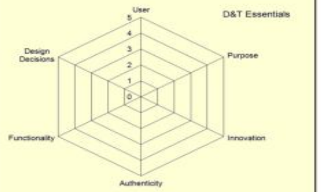
18. Key competencies

problem-solving | teamwork | negotiation | consumer awareness | organisation | motivation | persuasion | leadership | perseverance | other – specify

19. Health and safety

Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project.

20. Overall potential of project



D&T primary

Projects on a page sample

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Years 3/4 | **Mechanisms Pneumatics**

Instant CPD

Tips for teachers

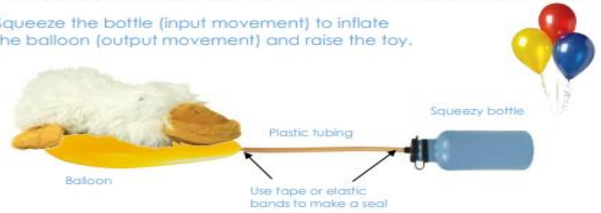
- Card from recycled packaging is a cost-efficient way of providing enough material for children to experiment with different arrangements and to make mock-ups and prototypes.
- To help develop children's technical knowledge, research images and videos of pneumatics in action, including Lego models and hydraulic systems used in construction machines.
- Tell the children that while air can be compressed, liquids cannot, which is why the syringe can feel squishy with a pneumatic system.
- Do not use syringes unless they are supplied in a sealed package.
- Take care – a large syringe can push out a small syringe with great force.
- Build up a collection of washing-up liquid bottles, egg boxes and other boxes well before starting the project. Make sure they are empty and properly cleaned before using them.
- Takeaway shops may give away a few clean food containers which can be covered in papier-mâché and painted.
- Get the children to blow air on their hands and feel the flow of air.
- Use a cycle pump to try to knock over a card structure, and then repeat using the air from a stronger pump or balloon.
- Balloons need to be securely fixed to the tubing. Use a tight elastic band wound several times or use masking tape.
- Display technical vocabulary and encourage the children to use it when discussing mechanisms and when designing and making.
- To ensure safety and hygiene, balloons should not be blown up by mouth.

Useful resources at www.data.org.uk

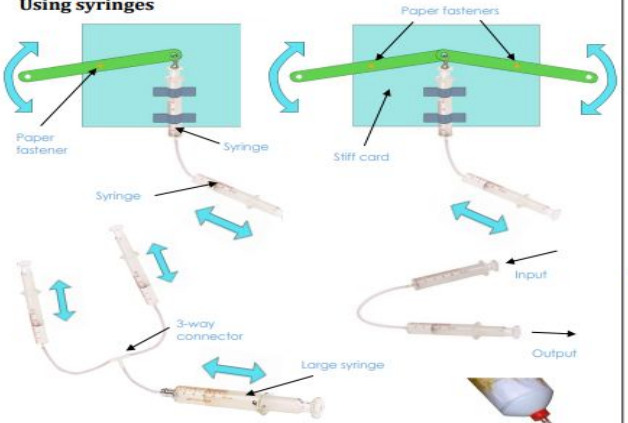
- Working with materials
- Working with Sliders and Levers

Teaching aids to demonstrate pneumatic systems

Squeeze the bottle (input movement) to inflate the balloon (output movement) and raise the toy.



Using syringes



Design decisions

- Children might use a squeezy bottle and a balloon in a container to raise or lower an object or a lever.
- They might choose to use three syringes connected by a T-connector so that two objects move backwards and forwards.
- Adding levers and linkages allows children to design and make more complex mechanical systems.

Designing, making and evaluating a moving 'creature in a box' toy for small children

An iterative process is the relationship between a pupil's ideas and how they are communicated and clarified through activity. This is an example of how the iterative design and make process *might* be experienced by an individual pupil during this project:

THOUGHT	ACTION
What sort of moving toy shall I make and who will it be for?	Discussing ideas, drawing annotated sketches, generating design criteria.
How will it fit into the box? How will it move? Which parts will move?	
Which pneumatic system will work best?	Modelling possible systems. Discussing and evaluating mock-ups and prototypes against the design criteria.
What materials will I need?	Discussing, exploring and trialling materials.
Who will I work with? How long will it take? What order will I work in? What tools and techniques will I use?	Negotiating, developing and agreeing a plan of action.
How will I finish it so that it looks attractive?	Discussing, exploring and trialling materials.
More thoughts … appraising, reflecting, refining.	More actions … building, testing, modifying.
Will the finished toy meet the needs of the user?	Evaluating the toy with the intended user and against the design criteria.

Glossary

- **Compressed** – something that is squashed, such as air in a tube.
- **Input** – what goes into a system.
- **Output** – what comes out of a system.
- **Pivot** – a point about which a lever turns.
- **Lever** – a beam which turns about a point.
- **Pneumatic** – a system that works using gases (air).
- **Hydraulic** – a system that works using liquids (water).
- **Pressure** – the force used on an object or surface.
- **Inflate** – fill something with air or a gas to make it swell up.
- **Deflate** – remove the pressurised air to allow an object like a balloon to shrink.
- **Syringe** – a tube with a nozzle and plunger for sucking and blowing air or liquids.
- **System** – a set of related parts or components used to create an outcome. Systems have an input, process and an output. In a pneumatic system, the 'input movement' is where the user pushes or pulls a syringe or pump. The 'output movement' is where the object at the end of the tube moves.

Knowledge and skills progression: DT

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Design						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Understand users, purpose and context	Can they work across a range of contexts: story based and local environment? Can they explain what products they are designing and making? Can they say who their product is for? Can they say how their product works? Can they discuss design criteria as a class?	Can they work across a range of contexts: story based, local community and leisure industry? Can they explain what products they are designing and making? Can they say how their product is suitable for the user? Can they explain how their product will work? Can they create individual design criteria?	Can they work across a range of contexts: home, industry, leisure and culture? Can they describe the purpose of their products Are they able to indicate the design features of their products that will appeal to intended users? Can they gather information about the needs and wants of particular individuals and groups? Can they develop their own design criteria and use these to inform their ideas?	Can they work across a range of contexts: home, enterprise, local community and leisure? Can they describe the purpose of their products Are they able to indicate the design features of their products that will appeal to intended users? Can they gather information about the needs and wants of particular individuals and groups, suggesting ways to do so? Can they develop their own design criteria and use these to inform their ideas?	Can they work across a range of contexts: home, industry, leisure and wider community? Can they describe the purpose of their products Are they able to indicate the design features of their products that will appeal to intended users? Can they explain how their product will work? Can they carry out research, using surveys, interviews and questionnaires? Can they identify the needs and wants of particular individuals and groups? Can they develop a simple design specification to guide their thinking?	Can they work across a range of contexts: home, industry, wider and local environment? Can they describe the purpose of their products Are they able to indicate the design features of their products that will appeal to intended users? Can they explain in detail how their product will work? Can they carry out research, using surveys, interviews, questionnaires and web-based resources? Can they identify the needs, wants, preferences and values of particular individuals and groups? Can they develop a design specification to guide their thinking?
Generating, developing, modelling and communicating ideas	Can they draw upon their own experiences to generate ideas? Can they communicate their ideas to others?	Can they draw upon their own experiences and existing products to develop ideas? Can they use discussion and drawings to communicate their ideas?	Can they share and clarify ideas through discussion? Can they model their ideas using prototypes and pattern pieces? Can they use annotated sketches to communicate their ideas?	Can they share and clarify ideas through discussion? Can they model their ideas using prototypes and pattern pieces? Can they use annotated sketches and cross-sectional drawings to develop and communicate their ideas?	Can they share and clarify ideas through discussion? Can they model their ideas using prototypes and pattern pieces? Can they use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas?	Can they share and clarify ideas through discussion? Can they model their ideas using prototypes and pattern pieces? Can they use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas?

Knowledge and skills progression: DT

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			Can they generate realistic ideas, focusing on the needs of the user?	Can they generate realistic ideas, focusing on the needs of the user? Can they make design decisions that take account of the availability of resources?	Can they explain what Computer aided design is and how it might be used? Can they generate innovative ideas, drawing on their own research? Can they make design decisions, taking account of constraints such as resources and cost?	Can they use computer-aided design to develop and communicate their ideas? Can they generate innovative ideas, drawing on available research? Can they make design decisions, taking account of constraints such as time, resources and cost?
Great inventors and designers			To be discussed and implemented ASAP			
Making						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Planning	Can they plan by suggesting what to do next? Can they select tools and equipment? Can they select suitable materials?	Can they plan by suggesting what the next steps should be? Can they select tools and equipment and explain their choices? Can they choose from a range of materials the most suitable for the project	Can they select tools and equipment suitable for the task? Can they explain their choice of tools and equipment in relation to the skills and techniques they will be using? Do they select materials and components suitable for the task? Can the order the main stages of making?	Can they select tools and equipment suitable for the task? Can they explain their choice of tools and equipment in relation to the skills and techniques they will be using? Do they select materials and components suitable for the task? Can they order all the stages of making with justifications?	Can they select tools and equipment suitable for the task? Can they explain their choice of tools and equipment in relation to the skills and techniques they will be using? Do they select materials and components suitable for the task? Can they produce appropriate lists of tools, equipment and materials that they need? Can they formulate step-by-step plans as a guide to making?	Can they select tools and equipment suitable for the task? Can they explain their choice of tools and equipment in relation to the skills and techniques they will be using? Do they select materials and components suitable for the task? Can they explain their choice of materials and components according to functional properties and aesthetic qualities? Can they produce appropriate lists of tools, equipment and materials that they need?

Knowledge and skills progression: DT

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						Can they formulate step-by-step plans as a guide to making?
Practical skills & techniques: Mechanisms	**Sliders & Levers** Can they assemble, join and combine materials and components? Can they measure, mark out, cut and shape materials and components to make a slider or level mechanism? Can they use a range of materials and components to create their mechanism? Can they use tools and equipment safely?	**Wheels & Axis** Can they assemble, join and combine materials and components? Can they measure, mark out, cut and shape materials and components to make a wheel axis mechanism? Can they use a range of materials and components to create their mechanism? Can they use tools and equipment safely?	**Levers & Linkages** Can they explain and show mechanical systems such as levers and linkages? **Pneumatics** Can they explain how pneumatic systems create movement? Can they make their own pneumatic system?			**Gears & Pulleys** Can they explain mechanical systems such as cams or pulleys or gears create movement?
Structures		**Freestanding** Can they select the most appropriate material for their structure? Are they able to use tools appropriate for construction where appropriate? Can they join materials to make structure stable?	**Shell** Can they explain and show to make strong, stiff shell structures?			**Reinforce & strengthen** Can they explain and demonstrate how to reinforce and strengthen a 3D framework?

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Electrical circuits				**Simple circuits** Can they use simple electrical circuits and components can be used to create functional products?		**Complex circuits** Can they use more complex electrical circuits and components can be used to create functional products? Can they use Software such as TinkerCad to design their circuit?
Textiles		**2 identical shapes** Are they able to use correct tools to cut and join fabrics with some accuracy? Can they use a simple running stitch to attach two identical shapes together?		**Single fabric shapes but not identical** Can use a single fabric shape can be used to make a 3D textiles product?	**Combination of fabric shapes** Can use a 3D textiles product can be made from a combination of fabric shapes?	
Evaluating						
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Own ideas and products	Can they discuss what they have made and why? Can they make simple judgments about their own products?	Can they refer to the design criteria to make a judgement about their own product? Can they make suggestions of how to improve their own product next time?	Can they identify the strengths and areas for development in their ideas and products? Can they consider the views of others to improve their work? Can they use their design criteria to evaluate their completed products?	Can they identify the strengths and areas for development in their ideas and products? Can they consider the views of others, including intended users? Can they refer to their design criteria as they design and make? Can they use their design criteria to evaluate their completed products?	Can they identify the strengths and areas for development in their ideas and products? Can they consider the views of others, including intended users, to improve their work? Can they evaluate their ideas and products against their original design specification?	Can they identify the strengths and areas for development in their ideas and products? Can they consider the views of others, including intended users, to improve their work? Can they evaluate their ideas and products against their original design specification?
Existing products	Can they say what products are, who products are for and what products are for?	Can they say what products are, who products are for and what products are for?	Can they investigate: • how well products have been made • how well products have been designed	Can they investigate: • how well products have been made • how well products have been designed	Can they investigate and analyse: • how well products have been made	Can they investigate and analyse: • how well products have been made

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	Can they say what they like and dislike about products?	Can they explain how products work and how they are used? Do they know what materials products are made from? Can they say what they like and dislike about products and explain their reasons why?	• why materials have been chosen • what methods of construction have been used • how well products work • how well products achieve their purposes • how well products meet user needs and wants Can they investigate: • who designed and made the products • where products were designed and made • when products were designed and made	• why materials have been chosen • what methods of construction have been used • how well products work • how well products achieve their purposes • how well products meet user needs and wants Can they investigate and analyse: • who designed and made the products • where products were designed and made • when products were designed and made • Which products can be recycled or reused	• how well products have been designed • why materials have been chosen • what methods of construction have been used • how well products work • how well products achieve their purposes • how well products meet user needs and wants Can they investigate: • how much products cost to make • how innovative products are	• how well products have been designed • why materials have been chosen • what methods of construction have been used • how well products work • how well products achieve their purposes • how well products meet user needs and wants Can they investigate and analyse: • how much products cost to make • how innovative products are • how sustainable the materials in products are

Knowledge and skills progression: DT

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DESIGN AND TECHNOLOGY: COOKING AND NUTRITION PROGRESSION

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Can they identify how some vegetables grow? Can they support an adult to cut safely? Do they understand the need for safety and hygiene in the kitchen?	Do they explain the importance of washing hands? Can they explain where food comes from? Can they cut a fruit with a sharp knife safely? Can they peel fruit safely?	Do they understand the importance of 5 portions of fruit & veg a day? Do they understand that all food comes from plants or animals? Can they name and sort foods into the five groups in The eatwell plate Can they safely cut, peel and grate foods selecting the correct tools and equipment?	Do they understand that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world? Can they prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source? Can they use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking? Can they explain a healthy diet is made up from a variety and balance of different food and drink, as depicted in The eatwell plate?		Can they explain that seasons may affect the food available? Do they know how food is processed into ingredients that can be eaten or used in cooking? Can they decide which techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking will be required, as well as finding the equipment needed? Can they explain that a healthy diet is made up from a variety and balance of different food and drink, as depicted in The eatwell plate and that recipes can be adapted to change the appearance, taste, texture and aroma?	

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EYFS: Design and Technology

Hayes progression document – EYFS Design and Technology					
ELG • Use a range of small tools, including scissors, paintbrushes and cutlery • 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. • Make use of props and materials when role playing characters in narratives and stories					
Focus	**Designing**	**Making**	**Evaluating**	**Technical skills**	**Food technology**
Nursery ~~3& 4 year olds~~ will be learning to…	• Explore collections of materials with similar and/or different properties • Explore the different materials freely, to develop their ideas about how to use them and what to make • Explore how things work • Develop their own ideas and then decide which materials to use to express them. • Use drawings to represent ideas	• Select and use activities and resources, with help when needed. • Choose the right resources to carry out their own plan. • Make imaginative and complex 'small worlds' with blocks and construction kits. • Join different materials and explore different textures.	• Be able to express a point of view and debate when they disagree with an adult or friend • Use talk to organise themselves	• Use one-handed tools and equipment for a purpose	• Talk about the differences between materials & changes they notice • Make healthy choices about food and drink
Reception	• Develop own ideas through experimentation • Create collaboratively sharing ideas, resources & skills • Use talk to help work out problems and organise thinking and activities, and explain how things work and why they might happen	• Use increasing knowledge & understanding of tools & materials • Use simple tools to effect changes to materials • Manipulates materials to achieve planned effect • Selects tools and uses techniques needed to shape, assemble and join materials they are using, adapting work when necessary.	• Express & communicates working theories, feelings & understandings • Return to & build on previous learning, refining ideas & developing their ability to represent them • Discuss problems & how they might be solved	• Use different techniques for joining materials • Use tools independently, with care & precision • Develop their small motor skills so that they can use a range of tools and techniques competently, safely and confidently.	• Eats a healthy range of foodstuffs and understands the need for variety in food • Describes a range of different food texture and tastes when cooking and notices changes when they are combined or exposed to hot and cold temperatures
Year 1	• Work as part of a class to solve simple design problems • Begin to assess the usefulness of a range of materials according to their characteristics.	• Generate, develop, and communicate their ideas through discussion, drawings and models.	• Begin to review ideas based on feedback from others • Begin to explore and evaluate existing products. • Begin to evaluate ideas and products against design criteria.	• Begin to interpret design criteria so that products are purposeful, functional and appealing • Demonstrate the ability to use simple tools and equipment to perform practical tasks.	• Begin to understand where food comes from • Children begin to use the basic principles of a healthy and varied diet to prepare dishes.

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Key Vocabulary

Key Stage 1 Mechanisms		Lower Key Stage 2 Mechanical Systems	Upper Key Stage 2 Mechanical Systems
Focus Sliders and levers	Wheels and axles	Focus Levers and linkages-	Focus Pulleys or gears
slider, lever, pivot, slot, bridge/guide card, masking tape, paper fastener, join pull, push, up, down, straight, curve, forwards, backwards design, make, evaluate, user, purpose, ideas, design criteria, product, function	vehicle, wheel, axle, axle holder, chassis, body, cab assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism names of tools, equipment and materials used design, make, evaluate, purpose, user, criteria, functional	mechanism, lever, linkage, pivot, slot, bridge, guide system, input, process, output linear, rotary, oscillating, reciprocating user, purpose, function prototype, design criteria, innovative, appealing, design brief	pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor circuit, switch, circuit diagram annotated drawings, exploded diagrams mechanical system, electrical system, input, process, output design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief

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Key Vocabulary

Key Stage 1 Structures	Lower Key Stage 2 Structures	Upper Key Stage 2 Structures
Focus Free Standing Structures	Focus Shell Structures	Focus
cut, fold, join, fix structure, wall, tower, framework, weak, strong, base, top, underneath, side, edge, surface, thinner, thicker, corner, point, straight, curved metal, wood, plastic circle, triangle, square, rectangle, cuboid, cube, cylinder design, make, evaluate, user, purpose, ideas, design criteria, product, function	shell structure, three-dimensional (3-D) shape, net, cube, cuboid, prism, vertex, edge, face, length, width, breadth, capacity marking out, scoring, shaping, tabs, adhesives, joining, assemble, accuracy, material, stiff, strong, reduce, reuse, recycle, corrugating, ribbing, laminating font, lettering, text, graphics, decision, evaluating, design brief design criteria, innovative, prototype	frame structure, stiffen, strengthen, reinforce, triangulation, stability, shape, join, temporary, permanent design brief, design specification, prototype, annotated sketch, purpose, user, innovation, research, functional

Key Vocabulary

Key Stage 1 Food	Lower Key Stage 2 Food	Upper Key Stage 2 Food
Focus Preparing fruit and vegetables	Focus Healthy and varied diet	Focus Celebrating culture and seasonality
fruit and vegetable names, names of equipment and utensils sensory vocabulary e.g. soft, juicy, crunchy, sweet, sticky, smooth, sharp, crisp, sour, hard flesh, skin, seed, pip, core, slicing, peeling, cutting, squeezing, healthy diet, choosing, ingredients, planning, investigating tasting, arranging, popular, design, evaluate, criteria	name of products, names of equipment, utensils, techniques and ingredients texture, taste, sweet, sour, hot, spicy, appearance, smell, preference, greasy, moist, cook, fresh, savoury hygienic, edible, grown, reared, caught, frozen, tinned, processed, seasonal, harvested healthy/varied diet planning, design criteria, purpose, user, annotated sketch, sensory evaluations	ingredients, yeast, dough bran, flour, wholemeal, unleavened, baking soda spice, herbs fat, sugar, carbohydrate, protein, vitamins, nutrients, nutrition, healthy, varied, gluten, dairy, allergy, intolerance, savoury, source, seasonality utensils, combine, fold, knead, stir, pour, mix, rubbing in, whisk, beat, roll out, shape, sprinkle, crumble design specification, innovative, research, evaluate, design brief

Key Vocabulary

Key Stage 1 Textiles	Lower Key Stage 2 Textiles	Upper Key Stage 2 Textiles
Focus Templates and joining techniques	Focus 2D shape and 3D project	Focus Combining different fabric shapes
names of existing products, joining and finishing techniques, tools, fabrics and components template, pattern pieces, mark out, join, decorate, finish features, suitable, quality mock-up, design brief, design criteria, make, evaluate, user, purpose, function	fabric, names of fabrics, fastening, compartment, zip, button, structure, finishing technique, strength, weakness, stiffening, templates, stitch, seam, seam allowance user, purpose, design, model, evaluate, prototype, annotated sketch, functional, innovative, investigate, label, drawing, aesthetics, function, pattern pieces	seam, seam allowance, wadding, reinforce, right side, wrong side, hem, template, pattern pieces name of textiles and fastenings used, pins, needles, thread, pinking shears, fastenings, iron transfer paper design criteria, annotate, design decisions, functionality, innovation, authentic, user, purpose, evaluate, mock-up, prototype

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Key Vocabulary

Lower Key Stage 2 Electrical Systems	Upper Key Stage 2 Electrical Systems
Focus Simple circuits and switches	Focus More complex switches and circuits
series circuit, fault, connection, toggle switch, push-to-make switch, push-to-break switch, battery, battery holder, bulb, bulb holder, wire, insulator, conductor, crocodile clip control, program, system, input device, output device user, purpose, function, prototype, design criteria, innovative, appealing, design brief	series circuit, parallel circuit, names of switches and components, input device, output device, system, monitor, control, program, flowchart function, innovative, design specification, design brief, user, purpose

Substantive and disciplinary knowledge in design and technology

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Substantive knowledge

In design and technology, this is based on the knowledge of four key elements of the process of design (design, make, evaluate and technical knowledge). All of these elements will be taught in all year groups. These are:

Design	Know how to design a product that is purposeful, functional and appealing to a specific group.
Make	Know how to cut, join and finish a range of increasingly complex materials, ranging from paper to wood.
Evaluate	Know how to investigate, evaluate and analyse a range of existing products and their own designs based on a specific design criteria. In addition to this, children will know key individuals have helped to shape the world in which we live in.
Technical knowledge	Know how to apply their knowledge of specific materials to meet the criteria listed above in the design, make and evaluate stages.

Disciplinary knowledge

In design and technology, disciplinary knowledge is the process of enabling children to use their substantive knowledge of products and materials around them to make links between and across different areas of the curriculum.

Knowledge in design and technology will equip the children with the opportunity to explain how and why products have changed over time and how they might be further improved in the future.

They can use their knowledge and understanding to suggest how existing products may be improved with the advances in modern technology. Children with good disciplinary knowledge, will demonstrate that they have the cultural capital to become global citizens in an ever changing and technologically advancing world.

Retrieval - KS1

Year 1

- Understand different mechanisms produce different types of movement
- Distinguish between free moving and fixed axles
- Understand where a range of fruit and vegetables come from e.g. farmed or grown at home.
- Understand and use basic principles of a healthy and varied diet to prepare dishes, including how fruit and vegetables are part of ‘The eatwell plate’.

Year 2

- Know how to make freestanding structures stronger, stiffer and more stable
- Understand how simple 3-D textile products are made, using a template to create two identical shapes.
- Understand how to join fabrics using different techniques e.g. running stitch, glue, over stitch, stapling.
- Explore different finishing techniques e.g. using painting, fabric crayons, stitching, sequins, buttons and ribbons.

Retrieval - LKS2

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Year 3

- Understand and use lever and linkage mechanisms
- Distinguish between fixed and loose pivots
- Understand and use pneumatic mechanisms
- Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes
- Develop and use knowledge of how to construct strong, stiff shell structures
- Know how to use appropriate equipment and utensils to prepare and combine food
- Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught.

Year 4

- Know how to strengthen, stiffen and reinforce existing fabrics.
- Understand how to securely join two pieces of fabric together.
- Understand the need for patterns and seam allowances.
- Understand and use electrical systems in their products, such as series circuits incorporating switches, bulbs and buzzers
- Understand and use computing to program and control products containing electrical systems, such as series circuits incorporating switches, bulbs and buzzers
- Apply their understanding of computing to program and control their products

Retrieval - UKS2

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Year 5

- Understand that mechanical systems have an input, process and an output.
- Understand how cams can be used to produce different types of movement and change the direction of movement.
- Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement.
- Understand and use electrical systems in their products.
- Understand the use of computer control systems in products.
- Apply their understanding of computing to program, monitor and control their products

Year 6

- Understand how to strengthen, stiffen and reinforce 3-D frameworks
- A 3-D textile product can be made from a combination of accurately made pattern pieces,fabric shapes and different fabrics.
- Fabrics can be strengthened, stiffened and reinforced where appropriate.
- Know how to use utensils and equipment including heat sources to prepare and cook food.
- Understand about seasonality in relation to food products and the source of different food products

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ELF: Empowering Learners Through Feedback

'The most powerful single modification that enhances achievement is feedback.' (John Hattie)

Through effective assessment and feedback, we aim to raise attainment and accelerate progress for all pupils, helping them to 'be all they can be'.

At Hayes, we have developed 'ELF' : Empowering Learners Through Feedback.

ELF YOURSELF - Improve your own learning using a success criteria or similar.

ELF: ELF - Improve a peer's learning through peer feedback.

ELF HELP - Feedback from an adult to improve learning.

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Examples of learning: Design and Technology

Examples of learning: Design and Technology - EYFS

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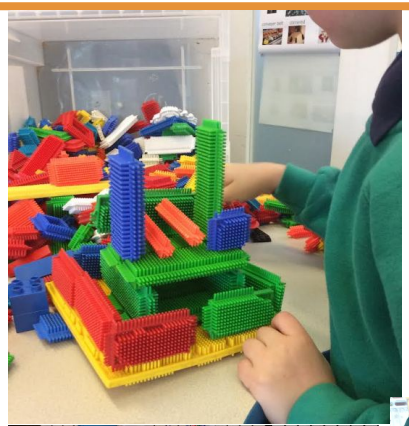







Examples of learning: Design and Technology - Sliders and Levers

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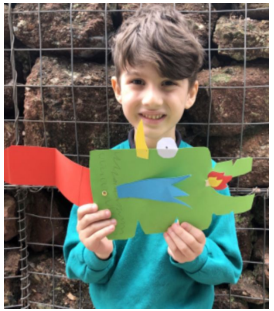

Examples of learning: Design and Technology - Electrical switches

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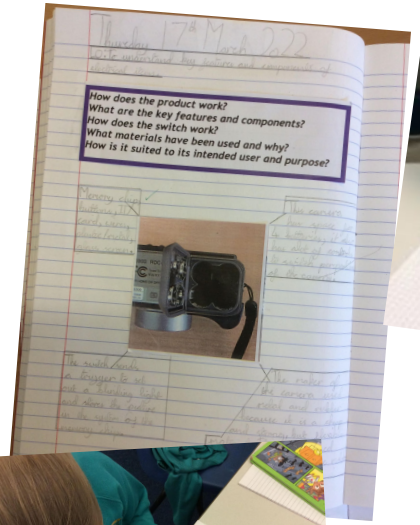

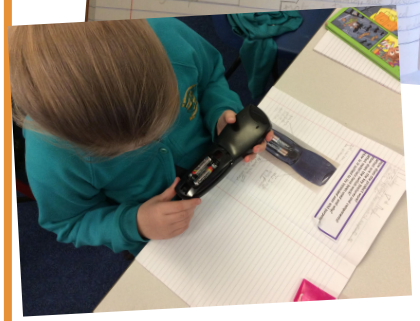

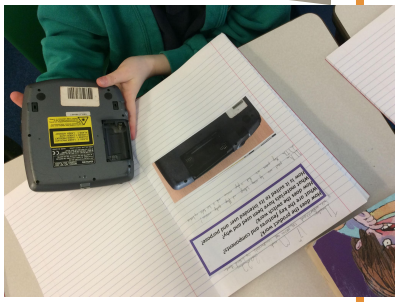

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ELF: Empowering Learners Through Feedback

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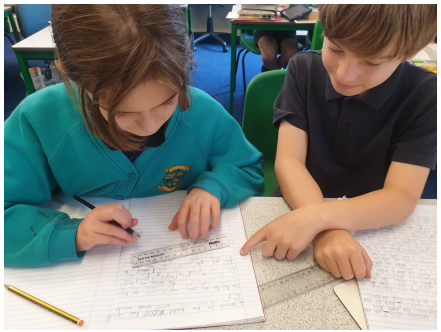
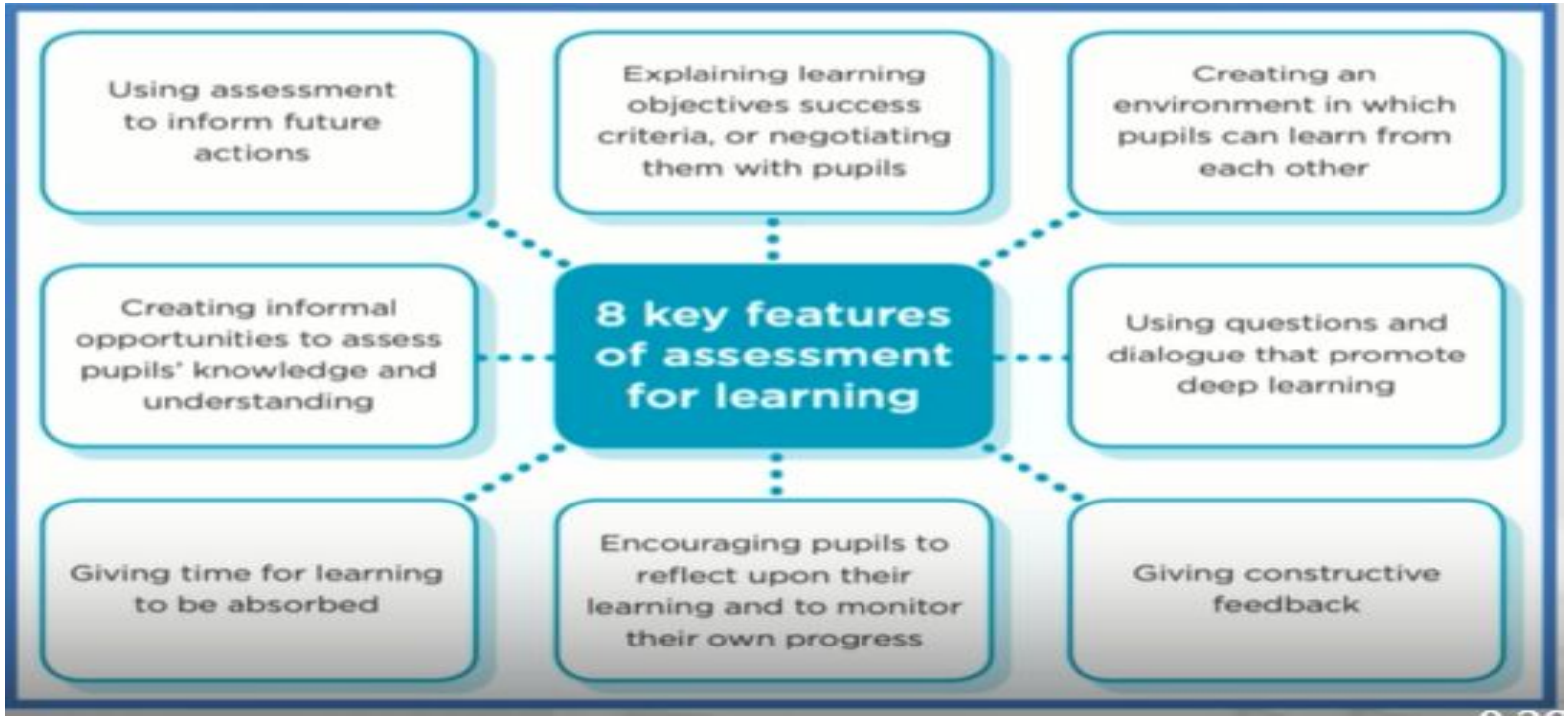
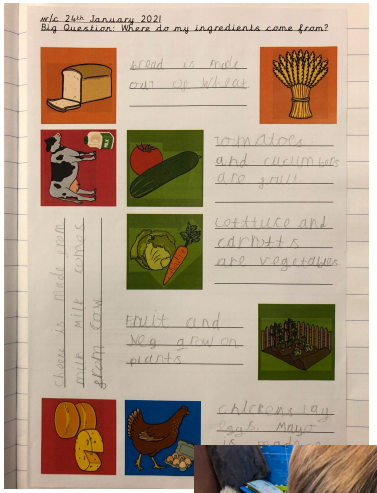
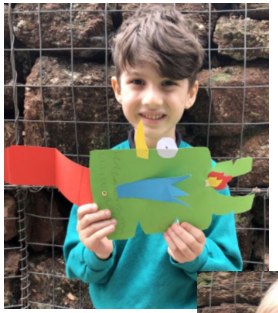


The role of assessment

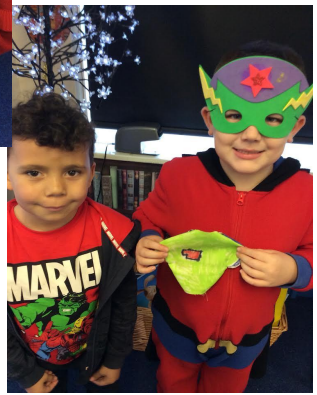


Year 1 - sliders and levers,preparing fruit & vegetables





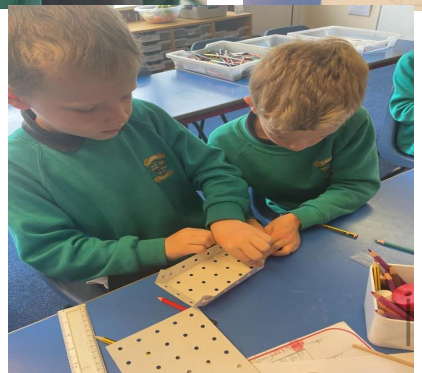
Year 2- Freestanding structures, templates and joining and wheels and axles



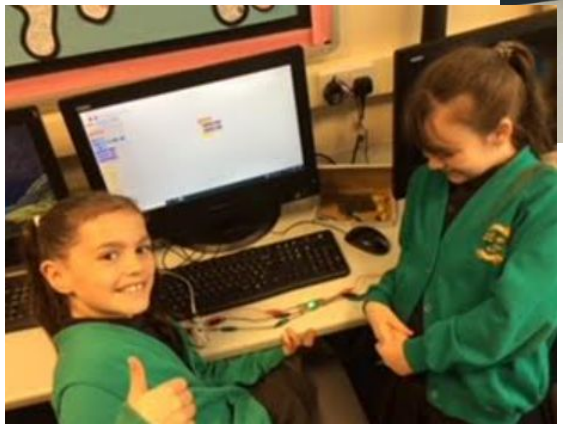
Year 2-Mechanisms-wheels and axles

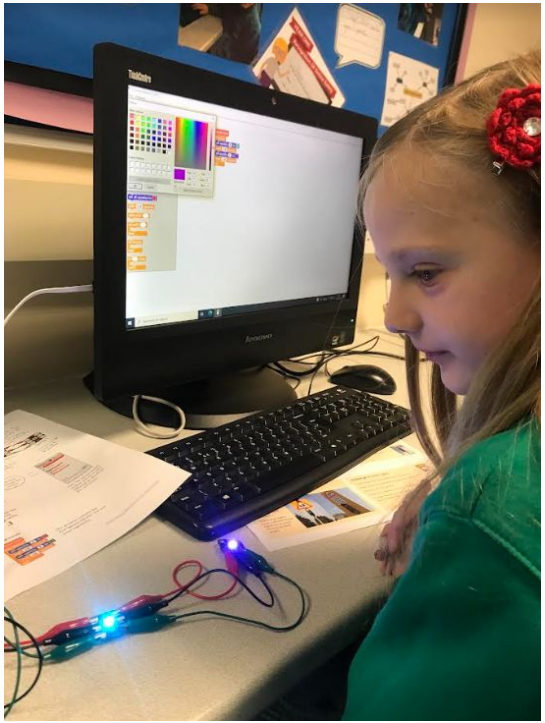




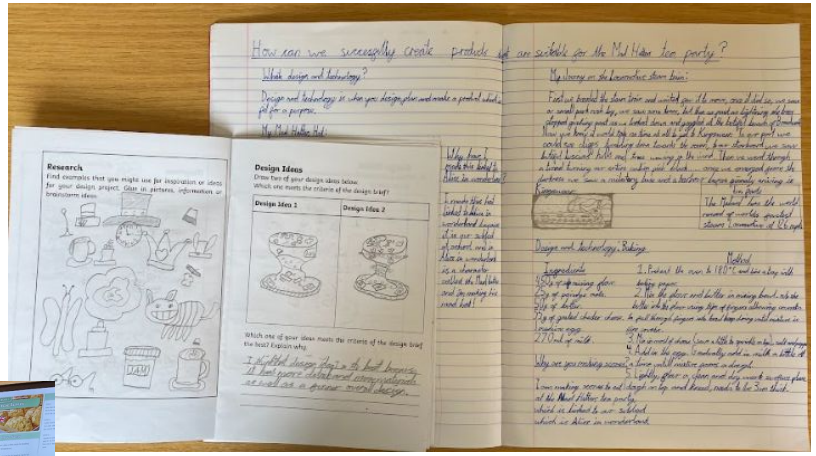




Year 4 - Electrical systems





Year 5 - Celebrating culture and seasonality



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The Hayes Values

Our six values are embedded in all areas of school life including our design and technology provision.

Responsibility - This is demonstrated by the sensible use of tools and equipment as well as risks the children will take throughout the project

Success - The children will succeed in designing and creating projects as well as succeeding in learning new skills

Aspirations - The children will aspire to think creatively and critically as well as to be the best designer they can be

Resilience - The children will always face challenges and problems along the way, but will show resilience in overcoming them

Discovery - Within design and technology there are so many different things to discover and the children will do so with passion and enthusiasm

Friendship - Within design and technology the children will work in teams and partners developing social and friendship skills