Houghton-on-the-Hill Primary School
Design & Technology

Our Vision for Design & Technology

Through Design and Technology, pupils will:

- Design and create high-quality products for real purposes and users.
- Develop creativity, problem-solving skills and technical knowledge.
- Follow the design process by researching, designing, making, testing and improving products.
- Work safely and confidently using a range of tools, materials and techniques.
- Evaluate existing products and use feedback to refine their own ideas.
- Apply learning from other subjects, including science, mathematics, computing and art.
- Develop cooking and nutrition skills for healthy, independent living.
- Explore how Design and Technology shapes our local community and the wider world.
- Gain an appreciation of inventions, innovation and the work of designers and engineers.
- Develop a lifelong interest in designing, making and creating.



A memorable definition for Design & Technology

Designing and making:

Something for

Somebody for

Some purpose

Summary of Design & Technology provision in each class

- Two engaging, high-quality Design and Technology projects per year.
- An additional project or activity to develop knowledge of cooking and nutrition.
- Opportunities to connect learning with the local community.
- Strong links to other curriculum areas, including STEM subjects.
- Design and Technology may be taught through immersive project blocks lasting one or more days.

Design & Technology in EYFS

In the Early Years, Design and Technology is woven throughout children's play, exploration and learning. Through opportunities to design, build, create, test and improve, children begin to develop the curiosity, creativity and practical skills that form the foundation of future Design and Technology learning.

Children use a wide range of materials, tools and construction equipment to investigate how things work and solve simple problems. Using the making area, outdoor provision and continuous provision opportunities, they design and create products linked to their learning themes, such as pet carriers, lamps, rockets, bridges, boats and vehicles.

Design and Technology in EYFS supports the development of key skills across the Early Years Foundation Stage framework:

- Creating with Materials by exploring and combining materials, tools and techniques.
- Understanding the World by investigating how structures, vehicles and everyday objects work.
- Communication and Language by discussing ideas, explaining designs and evaluating outcomes.
- Personal, Social and Emotional Development by working collaboratively, taking risks safely and persevering when solving problems.

Children are encouraged to ask questions, make decisions, test their ideas and adapt their designs. Through these hands-on experiences, they develop creativity, resilience, problem-solving skills and an understanding that design can be used to meet the needs of others and solve real-world challenges.

Examples of Design & Technology in EYFS

Examples of EYFS Design and Technology Projects

Autumn Term
- Design and make a pet carrier
- Design and make a Diva lamp
- Design and make Eid decorations
- Design and make a cave

Spring Term
- Design and make a spaceship or rocket

Summer Term
- Design and make a bridge
- Design and make a floating boat
- Construct a beanstalk
- Construct a minibeast habitat
- Design and make a vehicle

Throughout the Year Children regularly access a range of design and making opportunities through continuous provision, the making area and outdoor learning environments, allowing them to explore materials, develop practical skills and apply their ideas independently.

Examples of some of Houghton Primary School's Design & Technology Projects

Year 1 will design, make and evaluate a class moving picture book based on *Owl Babies* for children in Foundation Stage to read and enjoy. Pupils will explore simple mechanisms, such as sliders and levers, to create moving illustrations while considering the needs and interests of their intended audience.

Year 2 will design, make and evaluate a vehicle inspired by *Wacky Races*. Pupils will investigate wheels and axles to understand how vehicles move, before designing and creating their own moving car to race and test against their classmates' designs.
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Year 3 will design, make and evaluate protective shell packaging for a product. Pupils will explore how different shapes, structures and materials can be used to protect an item, before creating and testing their own packaging against a set of design criteria.

Year 4 will design, make and evaluate a tear-and-share pizza as part of their learning about nutrition and healthy eating. Pupils will explore the principles of a balanced diet, carefully selecting ingredients to create a nutritious and appealing product before evaluating it against their design criteria.

Year 5 will design, make and evaluate a fairground ride using gears, pulleys and electrical systems. Pupils will explore how mechanical and electrical components work together to create movement, before designing and constructing their own ride and evaluating how effectively it meets its purpose.

Year 6 will design, make and evaluate a warming, healthy soup to be served after Carol Singing. There are lots of factors they have to consider (warmth, common allergies, dietary requirements) and some members of the carol singers are vegetarian.

Design & Technology Curriculum

HOUGHTON ON THE HILL CE PRIMARY SCHOOL

DESIGN AND TECHNOLOGY CURRICULUM

	Unit 1	UNIT 2	UNIT 3
YEAR 1	STRUCTURES Free Standing Oak Academy link: Free standing structures	MECHANISMS Sliders and levers Oak Academy link: Moving story books	COOKING AND NUTRITION Preparing Fruit and Vegetables Oak Academy link: Food and drink for life
	Grandad's shack from Grandad's Island	Moving Picture Book Owl Babies	Fruit kebabs for healthy eating
YEAR 2	TEXTILES Templates and joining Oak Academy link: Puppets	MECHANISMS Wheels and Axels Oak Academy link: Wheels and Axels	COOKING AND NUTRITION Preparing Fruit and Vegetables Oak Academy link: Making a healthy wrap for lunch
	Monster Puppets	Wacky Races	Vegetable Dolls
YEAR 3	STRUCTURES Shell Oak Academy link: Shell structures : packaging	MECHANISMS Oak Academy link: Pneumatics: Moving toys	COOKING AND NUTRITION Healthy and Varied diet Oak academy link: Cooking without heat: Making veggie dips and dippers
	Create packaging	Moving toys	Healthy Dips
YEAR 4	TEXTILES Oak Academy link: 2D shapes to 3 D products	MECHANISMS Oak Academy link: Levers and linkages: Interactive books	COOKING AND NUTRITION Oak Academy link: Making a tear and share pizza
	Stationery storage	Interactive book	Pizza making
YEAR 5	TEXTILES Oak Academy link: Combining fabrics: Accessible textiles	ELECTRICAL SYSTEMS Oak Academy link Pullies and Gears: Electric vehicles	COOKING AND NUTRITION Oak Academy link: Safe and edible food – Making pasties
	Christmas decorations	Fairground rides	Healthy Pasties
YEAR 6	TEXTILES Oak Academy link: Textile pattern pieces: Hats and Caps	MECHANISMS Oak Academy link: Cams automata	COOKING AND NUTRITION Celebrating culture and Seasonality
	Mad Hatter's Hats	Cam mechanisms	Healthy Soup

LEARN ACADEMIES TRUST

Designing

Understanding context, users and purposes	*Understanding context, users and purposes*	*Understanding context, users and purposes*
Across KS1 pupils will: • work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment • state what products they are designing and making • say whether their products are for themselves or other users • describe what their products are for • say how their products will work • say how they will make their products suitable for their intended users • use simple design criteria to help develop their ideas	*Across KS2 pupils will:* • work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment • describe the purpose of their products • indicate the design features of their products that will appeal to intended users • explain how particular parts of their products work *In early KS2 pupils will also:* • gather information about the needs and wants of particular individuals and groups • develop their own design criteria and use these to inform their ideas	*Across KS2 pupils will:* • work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment • describe the purpose of their products • indicate the design features of their products that will appeal to intended users • explain how particular parts of their products work *In late KS2 pupils will also:* • carry out research, using surveys, interviews, questionnaires and web-based resources • identify the needs, wants, preferences and values of particular individuals and groups • develop a simple design specification to guide their thinking
Generating, developing, modelling and communicating ideas	*Generating, developing, modelling and communicating ideas*	*Generating, developing, modelling and communicating ideas*
Across KS1 pupils will: • generate ideas by drawing on their own experiences • use knowledge of existing products to help come up with ideas • develop and communicate ideas by talking and drawing • model ideas by exploring materials, components and construction kits and by making templates and mock- ups • use information and communication technology, where appropriate, to develop and communicate their ideas	*Across KS2 pupils will:* • share and clarify ideas through discussion • model their ideas using prototypes and pattern pieces • use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas • use computer-aided design to develop and communicate their ideas *In early KS2 pupils will also:* • generate realistic ideas, focusing on the needs of the user • make design decisions that take account of the availability of resources.	*Across KS2 pupils will:* • share and clarify ideas through discussion • model their ideas using prototypes and pattern pieces • use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas • use computer-aided design to develop and communicate their ideas In late KS2 pupils will also: • generate innovative ideas, drawing on research • make design decisions, taking account of constraints such as time, resources and cost

Making

Planning	Planning	Planning
Across KS1 pupils will: • plan by suggesting what to do next • select from a range of tools and equipment, explaining their choices • select from a range of materials and components according to their characteristics	*Across KS2 pupils will:* • select tools and equipment suitable for the task • explain their choice of tools and equipment in relation to the skills and techniques they will be using • select materials and components suitable for the task • explain their choice of materials and components according to functional properties and aesthetic qualities *In early KS2 pupils will also:* • order the main stages of making	*Across KS2 pupils will:* • select tools and equipment suitable for the task • explain their choice of tools and equipment in relation to the skills and techniques they will be using • select materials and components suitable for the task • explain their choice of materials and components according to functional properties and aesthetic qualities *In late KS2 pupils will also:* • produce appropriate lists of tools, equipment and materials that they need • formulate step-by-step plans as a guide to making
Practical skills and techniques	***Practical skills and techniques***	***Practical skills and techniques***
Across KS1 pupils will: • follow procedures for safety and hygiene • use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components • measure, mark out, cut and shape materials and components • assemble, join and combine materials and components • use finishing techniques, including those from art and design	*Across KS2 pupils will:* • follow procedures for safety and hygiene • use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components *In early KS2 pupils will also:* • measure, mark out, cut and shape materials and components with some accuracy • assemble, join and combine materials and components with some accuracy • apply a range of finishing techniques, including those from art and design, with some accuracy	*Across KS2 pupils will:* • follow procedures for safety and hygiene • use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components *In late KS2 pupils will also:* • accurately measure, mark out, cut and shape materials and components • accurately assemble, join and combine materials and components • accurately apply a range of finishing techniques, including those from art and design • use techniques that involve a number of steps • demonstrate resourcefulness when tackling practical problems

Evaluating

Own ideas and products	Own ideas and products	Own ideas and products
Across KS1 pupils will: • talk about their design ideas and what they are making • make simple judgements about their products and ideas against design criteria • suggest how their products could be improved	*Across KS2 pupils will:* • identify the strengths and areas for development in their ideas and products • consider the views of others, including intended users, to improve their work *In early KS2 pupils will also:* • refer to their design criteria as they design and make • use their design criteria to evaluate their completed products	*Across KS2 pupils will:* • identify the strengths and areas for development in their ideas and products • consider the views of others, including intended users, to improve their work *In late KS2 pupils will also:* • critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make • evaluate their ideas and products against their original design specification
Existing products	*Existing products*	*Existing products*
Across KS1 pupils will explore: • what products are • who products are for • what products are for • how products work • how products are used • where products might be used • what materials products are made from • what they like and dislike about products	*Across KS2 pupils will investigate and analyse:* • how well products have been designed • how well products have been 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 *In early KS2 pupils will also investigate and analyse:* • who designed and made the products • where products were designed and made • when products were designed and made • whether products can be recycled or reused	*Across KS2 pupils will investigate and analyse:* • how well products have been designed • how well products have been 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 *In late KS2 pupils will also investigate and analyse:* • *how much products cost to make* • *how innovative products are* • *how sustainable the materials in products are* • *what impact products have beyond their intended purpose*
Key events and individuals	*Key events and individuals*	*Key events and individuals*
Not a requirement	Across KS2 pupils will know: • about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products	Across KS2 pupils will know: • about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products

Technical Knowledge

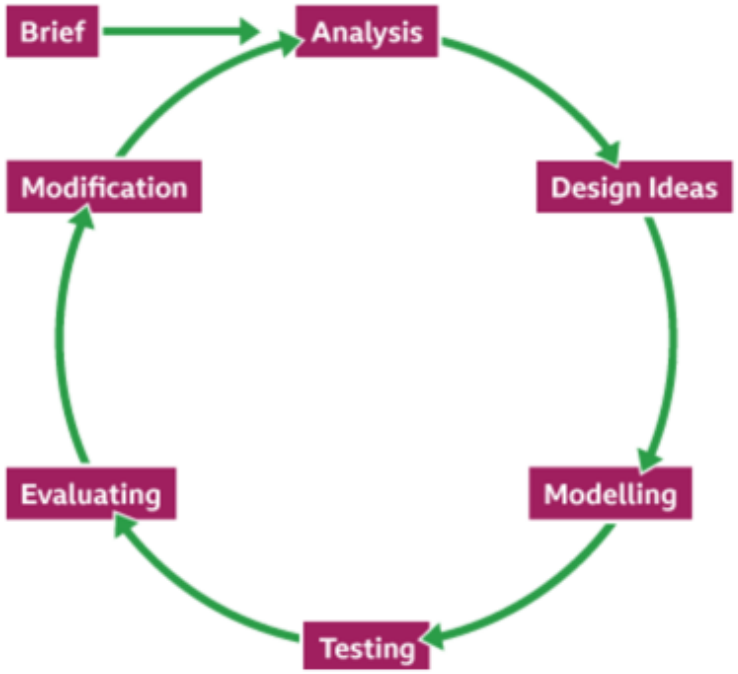
Across KS1 pupils will know: • about the simple working characteristics of materials and components • about the movement of simple mechanisms such as levers, sliders, wheels and axles • how freestanding structures can be made stronger, stiffer and more stable • that a 3-D textiles product can be assembled from two identical fabric shapes • that food ingredients will be combined according to their sensory characteristics • the correct technical vocabulary for the projects they are undertaking	*Across KS2 pupils will know:* • how to use learning from science to help design and make products that work • how to use learning from mathematics to help design and make products that work • that materials have both functional properties and aesthetic qualities • that materials can be combined and mixed to create more useful characteristics • that mechanical and electrical systems have an input, process and output • the correct technical vocabulary for the projects they are undertaking *In early KS2 pupils will also know* : • how mechanical systems such as levers and linkages or pneumatic systems create movement • how simple electrical circuits and components can be used to create functional products • how to program a computer to control their products • how to make strong, stiff shell structures • that a single fabric shape can be used to make a 3D textiles product • that food ingredients can be fresh, pre-cooked and processed	*Across KS2 pupils will know:* • how to use learning from science to help design and make products that work • how to use learning from mathematics to help design and make products that work • that materials have both functional properties and aesthetic qualities • that materials can be combined and mixed to create more useful characteristics • that mechanical and electrical systems have an input, process and output • the correct technical vocabulary for the projects they are undertaking *In late KS2 pupils will also know:* • how mechanical systems such as cams or pulleys or gears create movement • how more complex electrical circuits and components can be used to create functional products • how to program a computer to monitor changes in the environment and control their products • how to reinforce and strengthen a 3D framework • that a 3D textiles product can be made from a combination of fabric shapes • that a recipe can be adapted by adding or substituting one or more ingredients

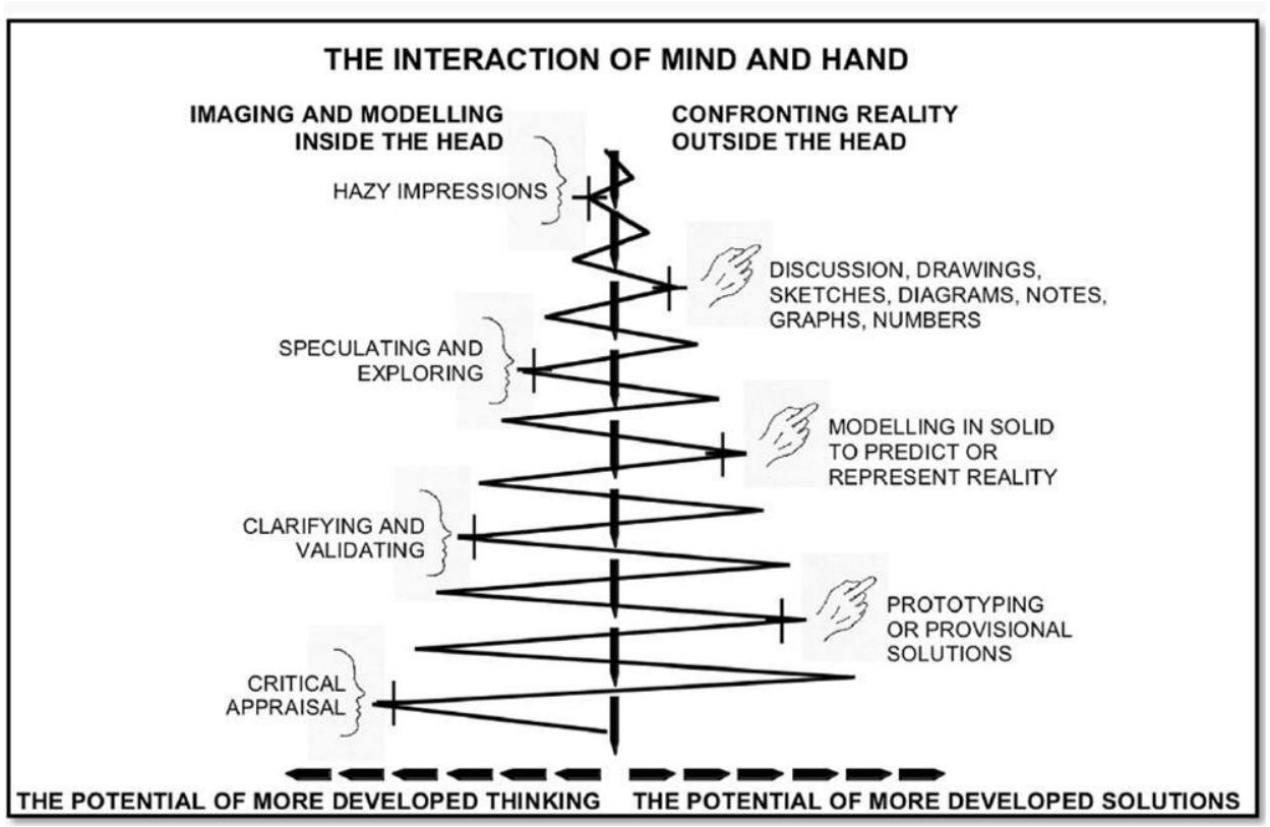
Cooking and Nutrition

Where food comes from	Where food comes from	Where food comes from
Across KS1 pupils will know: • *that all food comes from plants or animals* • *that food has to be farmed, grown elsewhere (e.g. home) or caught*	*Across KS2 pupils will know:* • that a recipe can be adapted a by adding or substituting one or more ingredients • 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	*Across KS2 pupils will know:* • that a recipe can be adapted a by adding or substituting one or more ingredients • 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 *In late KS2 pupils will also know:* • that seasons may affect the food available • how food is processed into ingredients that can be eaten or used in cooking
Food preparation, cooking and nutrition	**Food preparation, cooking and nutrition**	**Food preparation, cooking and nutrition**
Across KS1 pupils will know: • how to name and sort foods into the five groups in The eatwell plate • that everyone will eat at least five portions of fruit and vegetables every day • how to prepare simple dishes safely and hygienically, without using a heat source • how to use techniques such as cutting, peeling and grating	Across KS2 pupils will know: • how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source • how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking In early KS2 pupils will also know: • that a healthy diet is made up from a variety and balance of different food and drink, as depicted in the eatwell plate • that to be active and healthy, food and drink are needed to provide energy for the body	Across KS2 pupils will know: • how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source • how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking In late KS2 pupils will also know: • that recipes can be adapted to change the appearance, taste, texture and aroma • that different food and drink contain different substances – nutrients, water and fibre – that are needed for health

The Design Process

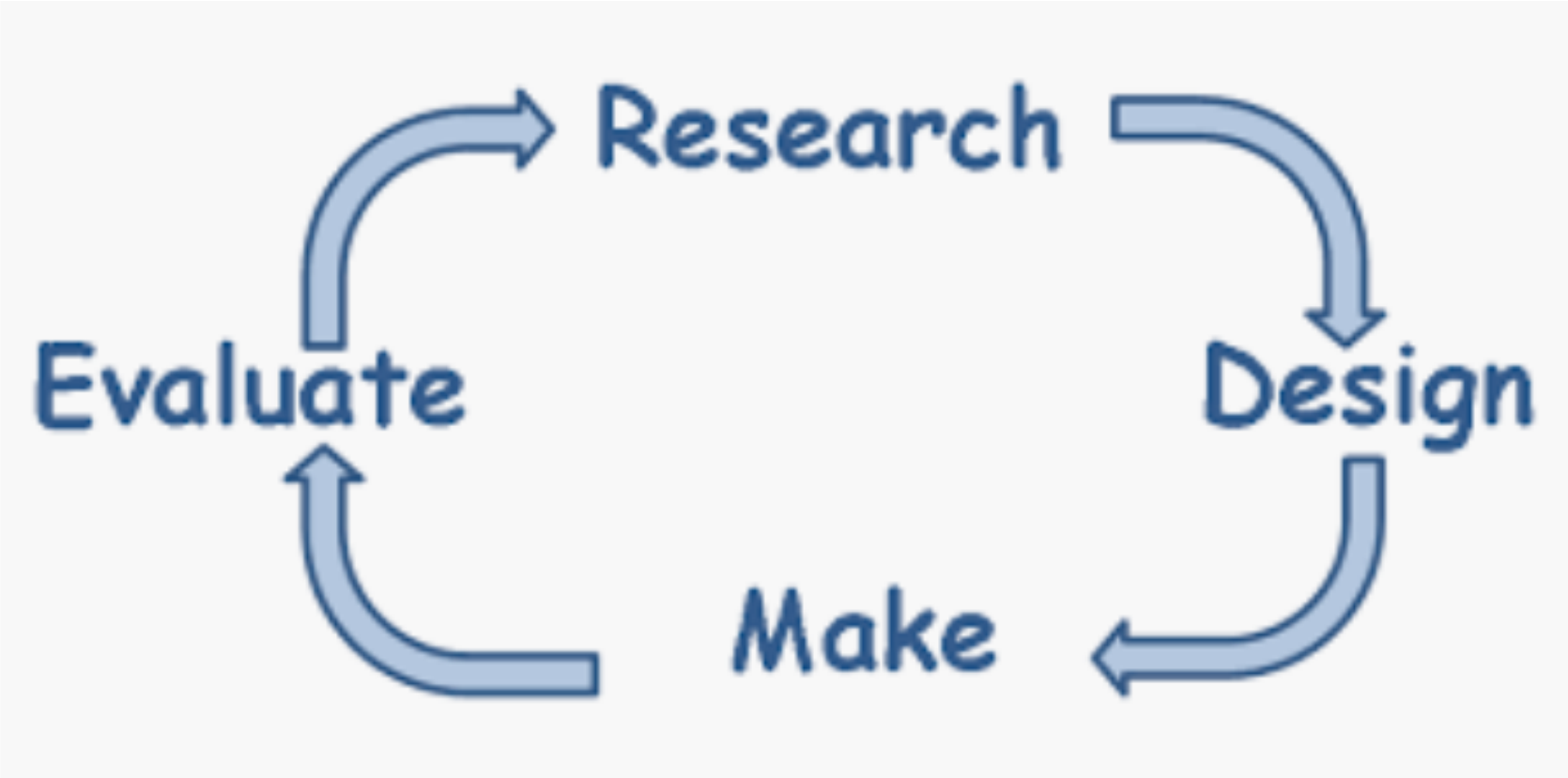
Design and Technology follows an iterative design process, where pupils design, make, test, evaluate and improve their products. This helps children develop creativity, resilience and problem-solving skills.





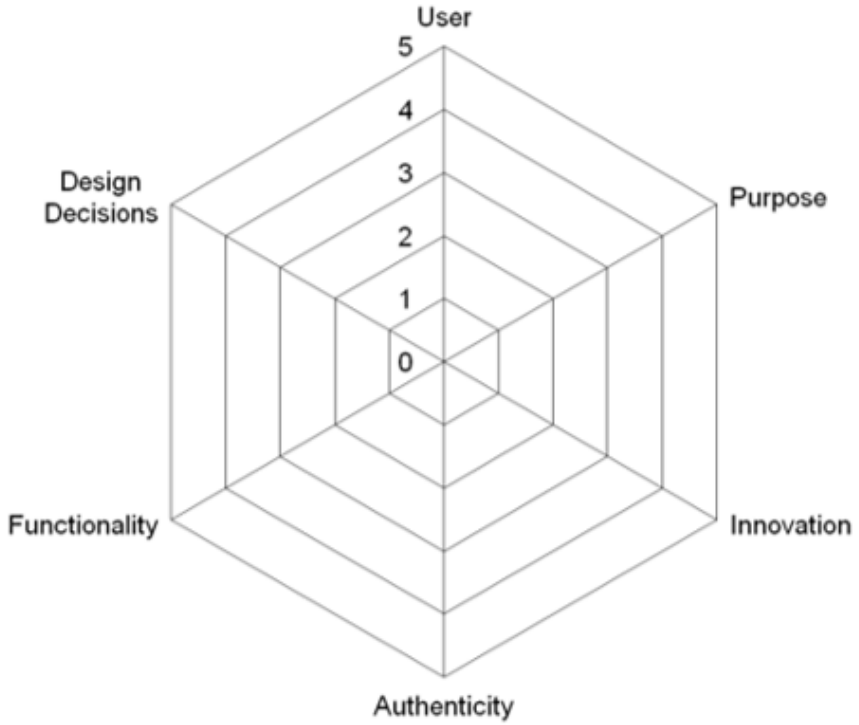
The Consistent Design Process

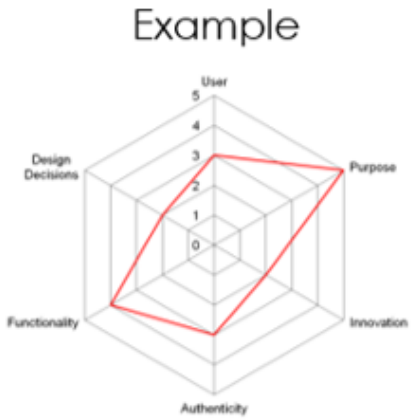
We keep our consistent design process across the school at Houghton.



Design & Technology Principles

Design and Technology projects incorporate all of the key Design and Technology principles, although some may place a greater emphasis on skills and areas of learning than others.







Through Design & Technology, pupils will

- Design for a purpose and meet the needs of intended users.
- Generate, communicate and refine creative ideas.
- Develop practical skills and technical competence.
- Apply scientific and mathematical knowledge to real-world problems.
- Evaluate products and use feedback to make improvements.
- Build confidence in using technical vocabulary.

At Houghton Primary School, Design & Technology is:

- Progressive and ambitious
- Consistent and well-sequenced
- Challenging and inclusive
- Purposeful and meaningful
- Relevant to the wider world
- Enjoyable and engaging

Let's go Zero

Through Design and Technology, pupils learn how innovative and responsible design can contribute to a more sustainable future. As part of our Let's Go Zero campaign, children consider how their design choices can reduce waste, conserve resources and support efforts to lower carbon emissions by:

- Choosing sustainable and recyclable materials where possible.
- Reducing waste through careful planning and making.
- Designing products that are durable and fit for purpose.
- Considering the environmental impact of food production and packaging.
- Exploring how innovation and technology can help solve environmental challenges.
- Developing the knowledge and skills needed to create a more sustainable future.

