Woodbridge Junior School

Design and Technology Policy
September 2021

Intent

Design and Technology is an inspiring, rigorous and practical subject. Design and Technology encourages children to learn to think and intervene creatively to solve problems both as individuals and as members of a team. At Woodbridge Junior School, we encourage children to use their creativity and imagination, to design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. We aim to, wherever possible, link work to other subjects such as mathematics, science, engineering, computing and art. The children are also given opportunities to reflect upon and evaluate past and present design technology, its uses and its effectiveness and are encouraged to become innovators and risk-takers.

Implementation

Through a variety of creative and practical activities, we teach the knowledge, understanding and skills needed to engage in an iterative process of designing and making. The children design and create products that consider function and purpose and which are relevant to a range of sectors (for example, the home, school, leisure, culture, enterprise, industry and the wider environment).
When designing and making, the children are taught to:

Design

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

Make

- select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing, as well as chopping and slicing) accurately.
- select from and use a wider range of materials, ingredients and components, including construction materials, textiles and ingredients, according to their functional properties, aesthetic qualities and, where appropriate, taste.

Evaluate

- investigate and analyse a range of existing products.
- evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.
- understand how key events and individuals in design and technology have helped shape the world.

Technical knowledge

- apply their understanding of how to strengthen, stiffen and reinforce more complex structures.
- understand and use mechanical systems in their products.
- understand and use electrical systems in their products.
- apply their understanding of computing to program, monitor and control their products
- Understand some of the ways that food can be processed and the effect of different cooking practices (including baking and grilling).

Cooking and Nutrition

- 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.

Key skills and key knowledge for D and T have been mapped across the school to ensure progression between year groups. The context for the children's work in Design and Technology is also well considered and children learn about real life structures and the purpose of specific examples, as well as developing their skills throughout the programme of study.

Woodbridge Junior School

Progression of Skills

	Year 3	Year 4	Year 5	Year 6	NC End of KS
Design	•begin to research others' needs • show design meets a range of requirements • describe purpose of product • follow a given design criteria • have at least one idea about how to create product • create a plan which shows order, equipment and tools •describe design using an accurately labelled sketch and words • make design decisions •explain how product will work • make a prototype • begin to use computers to show design	• use research for design ideas • show design meets a range of requirements and is fit for purpose •begin to create own design criteria •have at least one idea about how to create product and suggest improvements for design. • produce a plan and explain it to others •say how realistic plan is. •include an annotated sketch •make and explain design decisions considering availability of resources •explain how product will work • make a prototype •begin to use computers to show design.	•use internet and questionnaires for research and design ideas •take a user's view into account when designing • begin to consider needs/wants of individuals/groups when designing and ensure product is fit for purpose •create own design criteria • have a range of ideas •produce a logical, realistic plan and explain it to others. •use cross-sectional planning and annotated sketches • make design decisions considering time and resources. •clearly explain how parts of product will work. •model and refine design ideas by making prototypes and using pattern pieces. •use computer-aided designs	• draw on market research to inform design • use research of user's individual needs, wants, requirements for design • identify features of design that will appeal to the intended user • create own design criteria and specification • come up with innovative design ideas •follow and refine a logical plan. •use annotated sketches, cross-sectional planning and exploded diagrams • make design decisions, considering, resources and cost • clearly explain how parts of design will work, and how they are fit for purpose • independently model and refine design ideas by making prototypes and using pattern pieces • use computer-aided designs	*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 *Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design
Make	•select suitable tools/equipment, explain choices; begin to use them accurately • select appropriate materials, fit for purpose. • work through plan in order •consider how good product will be • begin to measure, mark out, cut and shape materials/components with some accuracy • begin to assemble, join and combine materials and components with some accuracy • begin to apply a range of finishing techniques with some accuracy	• select suitable tools and equipment, explain choices in relation to required techniques and use accurately •select appropriate materials, fit for purpose; explain choices • work through plan in order. • realise if product is going to be good quality • measure, mark out, cut and shape materials/components with some accuracy •assemble, join and combine materials and components with some accuracy •apply a range of finishing techniques with some accuracy	• use selected tools/equipment with good level of precision • produce suitable lists of tools, equipment/materials needed •select appropriate materials, fit for purpose; explain choices, considering functionality • create and follow detailed step-by-step plan • explain how product will appeal to an audience • mainly accurately measure, mark out, cut and shape materials/components •mainly accurately assemble, join and combine materials/components • mainly accurately apply a range of finishing techniques • use techniques that involve a small number of steps • begin to be resourceful with practical problems	• use selected tools and equipment precisely •produce suitable lists of tools, equipment, materials needed, considering constraints • select appropriate materials, fit for purpose; explain choices, considering functionality and aesthetics • create, follow, and adapt detailed step-by-step plans •explain how product will appeal to audience; make changes to improve quality • accurately measure, mark out, cut and shape materials/components • accurately assemble, join and combine materials/components • accurately apply a range of finishing techniques • use techniques that involve a number of steps • be resourceful with practical problems	*Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately *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	• look at design criteria while designing and making •use design criteria to evaluate finished product • say what I would change to make design better •begin to evaluate existing products, considering: how well they have been made, materials, whether they work, how they have been made, fit for purpose • begin to understand by whom, when and where products were designed • learn about some inventors/designers/ engineers/chefs/ manufacturers of ground-breaking products	•refer to design criteria while designing and making •use criteria to evaluate product • begin to explain how I could improve original design •evaluate existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose • discuss by whom, when and where products were designed • research whether products can be recycled or reused • know about some inventors/designers/ engineers/chefs/manufacturers of ground-breaking products	•evaluate quality of design while designing and making •evaluate ideas and finished product against specification, considering purpose and appearance. •test and evaluate final product • evaluate and discuss existing products, considering: how well they've been made, materials, whether they work, how they have been made, fit for purpose • begin to evaluate how much products cost to make and how innovative they are •research how sustainable materials are •talk about some key inventors/designers/ engineers/ chefs/manufacturers of ground-breaking products	•designing and making; is it fit for purpose? • keep checking design is best it can be. •evaluate ideas and finished product against specification, stating if it's fit for purpose •test and evaluate final product; explain what would improve it and the effect different resources may have had •do thorough evaluations of existing products considering: how well they've been made, materials, whether they work, how they've been made, fit for purpose •evaluate how much products cost to make and how innovative they are •research and discuss how sustainable materials are •consider the impact of products beyond their intended purpose •discuss some key inventors/designers/ engineers/ chefs/manufacturers of ground-breaking products	*Investigate and analyse a range of existing products. *Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work. *Understand how key events and individuals in design and technology have helped shape the world.
Technical knowledge – Materials /structures	•use appropriate materials •work accurately to make cuts and holes • join materials •measure carefully to avoid mistakes •make a strong, stiff structure •continue working on product even if original didn't work		•select materials carefully, considering intended use of product, the aesthetics and functionality. •explain how product meets design criteria •measure accurately enough to ensure precision •ensure product is strong and fit for purpose •reinforce and strengthen a 3D frame		*Apply their understanding of how to strengthen, stiffen and reinforce more complex structures **(Y3)**
Technical knowledge - Mechanisms			•refine product after testing, considering aesthetics, functionality and purpose incorporate hydraulics and pneumatics •grow in confidence about trying new / different ideas •begin to use cams, pulleys or gears to create movement		*Understand and use mechanical systems in their products [for example, gears, pulleys, coms, levers and linkages] **(Y5)**
Technical knowledge -- Textiles	•join different textiles in different ways •choose textiles considering appearance and functionality •begin to understand that a simple fabric shape can be used to make a 3D textiles project	•think about user when choosing textiles •think about how to make product strong •begin to devise a template •explain how to join things in a different way •understand that a simple fabric shape can be used to make a 3D textiles project	•think about user and aesthetics when choosing textiles •use own template • think about how to make product strong and look better •think of a range of ways to join things	•think about user's wants/needs and aesthetics when choosing textiles •make product attractive and strong •make a prototype •use a range of joining techniques •think about how product might be sold •think carefully about what would improve product •understand that a single 3D textiles project can be made from a combination of fabric shapes.	

Woodbridge Junior School

Technical knowledge – Electrical systems Computer control and monitoring		•use simple circuit in product • incorporate switch into product •confidently use number of components in circuit		•use different types of circuit in product • think of ways in which adding a circuit would improve product •learn about how to program a computer to control product. •program a computer to monitor changes in environment and control product	*•Understand and use electrical systems in their products [for example, switches, bulbs, buzzers and motors]* **(Y4)** *•Apply their understanding of computing to program, monitor and control their products.* **(Y6)**
Technical knowledge – Food and nutrition	•carefully select ingredients •use equipment safely •make product look attractive •think about how to grow plants to use in cooking •begin to understand food comes from UK and wider world •describe how healthy diet= variety/balance of food/drinks •explain how food and drink are needed for active/healthy bodies. •prepare and cook some dishes safely and hygienically •grow in confidence using some of the following techniques: mixing, spreading, kneading and baking	•explain how to be safe/hygienic •think about presenting product in interesting/ attractive ways •understand ingredients can be fresh, pre-cooked or processed •begin to understand about food being grown, reared or caught in the UK or wider world •describe eat well plate and how a healthy diet=variety / balance of food and drinks •explain importance of food and drink for active, healthy bodies •prepare and cook some dishes safely and hygienically •use some of the following techniques: peeling, chopping, slicing, grating and mixing.	•explain how to be safe / hygienic and follow own guidelines •present product well - interesting, attractive, fit for purpose •begin to understand seasonality of foods •understand food can be grown, reared or caught in the UK and the wider world •describe how recipes can be adapted to change appearance, taste, texture, aroma •explain how there are different substances in food / drink needed for health •prepare and cook some savoury dishes safely and hygienically including, where appropriate, use of heat source •use range of techniques such as peeling, chopping, slicing, grating and mixing.	•understand a recipe can be adapted by adding / substituting ingredients •explain seasonality of foods •learn about food processing methods •name some types of food that are grown, reared or caught in the UK or wider world •adapt recipes to change appearance, taste, texture or aroma. •describe some of the different substances in food and drink, and how they can affect health •prepare and cook a variety of savoury dishes safely and hygienically including, where appropriate, the use of heat source. •use a range of techniques confidently such as spreading, kneading and baking.	*•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.*

These skills will be covered through the following projects:

Year 3	Year 4	Year 5	Year 6
Autumn Evaluate designs for insect hotels. Explore and evaluate how the design of sculpture through history shaped the world.	**Autumn** Create an electrical product incorporating switches, bulbs, buzzers and motors. Arkwright's Mill - Understand how key events and individuals in design and technology have helped shape the world.	**Autumn** Identify foods that have been harvested from the rainforest. Create tacos Create a Christmas sewing design.	**Autumn** Recycle materials to make products. Using digital resources to create own design.
Spring Design and create Stone Age dwellings. Use fire to cook Stone Age meal.	**Spring** Research and evaluate architecture in Ancient Greece and how they influenced our buildings today. Food tasting – taste typical Greek food. Design and create meal using ingredients tasted. Prepare and cook a healthy lunch. Use a range of cooking techniques.	**Spring** Design and evaluate a Trebuchet Design and create pizzas for a target audience.	**Spring** Design and make Viking Longships including sewing a flag. Evaluate a medical product.
Summer Research design, make and evaluate a Seed Bomb. Explore how the geography and the Sun dictate how and where we get our food.	**Summer** Research, design and evaluate cake recipe for the Tearooms challenge.	**Summer** Research, design and evaluate a gadget to use in space. Evaluate buildings built for Mountainous, earthquake or volcanic areas.	**Summer** Research, design and evaluate savoury scones. Programming

Impact

We ensure the children:

- develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users and critique, evaluate and test their ideas and products and the work of others
- understand and apply the principles of nutrition and learn how to cook. Children will design and make a range of products. A good quality finish will be expected in all design and activities made appropriate to the age and ability of the child

Children learn how to take risks, becoming resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present design and technology, they develop a critical understanding of its impact on daily life and the wider world. High-quality design and technology education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.