Radford Academy
A L.E.A.D. Academy

Radford Academy

Design & Technology

Curriculum

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Design & Technology at Radford Academy

Vision:

At Radford Academy, we aim to deliver a broad, ambitious and well-sequenced Design and Technology curriculum that inspires creativity, innovation and purposeful problem-solving. Through designing, making and evaluating a wide range of products, pupils develop the knowledge, skills and confidence to become resourceful, resilient and reflective designers.

Children are encouraged to think creatively, take informed risks and view mistakes as valuable opportunities for learning. They develop resilience, independence and critical thinking as they generate ideas, select appropriate materials and tools, refine their designs and evaluate the effectiveness of their products. Through practical experiences, children learn to design with a purpose, considering the needs and wants of users while developing an understanding of how design and technology shape the world around them.

Our curriculum enables pupils to master the fundamental skills of designing, making and evaluating across a range of contexts, including structures, mechanisms, textiles, food and nutrition, electrical systems and digital technologies. They build secure subject knowledge and technical vocabulary, develop an understanding of materials and their properties, and learn how designers, engineers, architects, chefs and inventors have influenced everyday life through innovation and creativity.

By the end of their primary education, children will have acquired the knowledge, skills and confidence to design, make and evaluate products with increasing independence. They will leave Radford Academy with an appreciation of the importance of design and technology in solving real-world problems, an understanding of how innovation improves lives, and the confidence to apply their creativity and technical knowledge in the future.

Intent

Intent

- To teach the content of the National Curriculum in an engaging and purposeful way that inspires children to become creative, innovative and confident designers, fostering a lifelong appreciation of design and technology.
- To provide opportunities for children to investigate, design, make and evaluate purposeful products that solve real and relevant problems, developing their creativity, independence and resilience.

- To develop children's knowledge and understanding of the design process, enabling them to generate ideas, communicate designs, select appropriate materials, use tools safely and evaluate the effectiveness of their products.
- To develop children's practical skills across the key areas of Design and Technology, including structures, mechanisms, textiles, food and nutrition and electrical systems, encouraging them to refine and improve their work through testing and evaluation.
- To develop children's understanding of significant designers, engineers, architects, inventors and chefs, helping them recognise the impact that design and technological innovation has on everyday life and the wider world.
- To provide rich first-hand experiences wherever possible, including the use of high-quality resources, technology, practical workshops, visitors and visits, enabling children to engage in meaningful and memorable learning experiences.
- To equip children with the knowledge, skills and confidence to become resourceful, resilient and reflective problem-solvers, preparing them for future learning and helping them understand how Design and Technology contributes to modern society.

Substantive Knowledge

Substantive knowledge, in the primary curriculum for Design and Technology, refers to the essential knowledge that pupils are expected to learn and understand about designing, making, evaluating and technical knowledge, including materials, mechanisms, structures, textiles, electrical systems and food and nutrition.

At Radford Academy, this knowledge is carefully sequenced to build progressively throughout the curriculum, enabling children to develop an understanding of how design and technology solve real-world problems and improve everyday life.

Through revisiting key concepts, vocabulary and technical knowledge, children make meaningful connections between products, designers, engineers and technological innovation, developing the confidence to design, make and evaluate purposeful products with increasing independence, creativity and precision.

Disciplinary Knowledge

Disciplinary knowledge is the procedural knowledge of how designers and technologists investigate, design, make, test and evaluate products to solve real-world problems.

It enables pupils to develop the practical skills needed to generate ideas, communicate designs, select and use appropriate materials, components, tools and equipment safely and accurately, and refine their work through testing and evaluation. Through designing and making purposeful products, children learn to apply technical knowledge, consider the needs of users, and make informed decisions throughout the

EYFS

In EYFS, children begin to develop the foundational knowledge, skills and attitudes that support future learning in Design and Technology. Through the **Expressive Arts and Design** and **Understanding the World** areas of learning, children are encouraged to explore, investigate, design and create using a wide range of materials, tools and construction equipment. They develop fine motor control, problem-solving skills and creativity as they build, join, construct, adapt and improve their models and creations.

Children are given regular opportunities to design and make with a purpose, experimenting with different materials, mechanisms and joining techniques while considering how and why things work. They learn to talk about their ideas, explain their choices and evaluate what they have made, developing resilience by adapting and improving their designs. Through practical experiences, stories, play and real-life contexts, children begin to understand that design and technology help to solve problems and meet the needs of people. These experiences establish the technical vocabulary, practical skills and design thinking that provide the foundation for the Design and Technology curriculum in Key Stage 1 and beyond.

Key Stage 1

In Key Stage 1, children build on the practical foundations established in EYFS by developing their knowledge of the design process and key technical concepts. They learn to design, make and evaluate purposeful products for a range of users, developing their understanding of structures, mechanisms, textiles and food. Children begin to use a wider range of materials, tools and equipment with increasing control and confidence, selecting appropriate resources and learning how to use them safely and accurately.
Pupils explore how existing products are designed and made, identifying what works well and suggesting improvements using subject-specific vocabulary. They develop their ability to generate ideas, communicate designs through drawings and templates, and evaluate

their finished products against design criteria. Across the key stage, children are encouraged to solve practical problems creatively, refine their ideas through testing, and begin to understand how design and technology influence everyday life.

Key Stage 2

In Key Stage 2, children build on the knowledge and skills developed in Key Stage 1 by refining their understanding of the design process and applying increasingly sophisticated technical knowledge. From Years 3 to 6, they develop greater confidence and precision when designing, making and evaluating products across a range of contexts, including structures, mechanisms, textiles, electrical systems, food and nutrition, and digital technologies. Pupils learn to generate innovative ideas, communicate their designs using annotated sketches and prototypes, and select appropriate materials, tools and components with increasing accuracy and independence.

Children investigate and evaluate a wider range of existing products and the work of significant designers, engineers, architects and inventors, considering how design and technology have influenced society and improved everyday life. They use subject-specific vocabulary to justify design decisions, test and evaluate their products against design criteria, and refine their work in response to feedback and testing.

By the end of Key Stage 2, children demonstrate independence, creativity and resilience, applying their knowledge and technical skills to design and make high-quality, purposeful products while developing a deeper understanding of the role of design and technology in solving real-world problems and shaping the modern world.

Implementation

Roles and Responsibilities

The Headteacher is responsible for ensuring that this policy is adhered to, and that:

- All required elements of the Design and Technology curriculum have aims and objectives which reflect the aims of the school and indicate how the needs of individual pupils will be met.
- The appropriate amount of time is provided for teaching the required elements of the Design and Technology curriculum and is reviewed by the governing body.
- The school's procedures for the assessment of Design and Technology meet all statutory requirements.
- The governing body is fully involved in decision-making processes that relate to the Design and Technology curriculum.
- The governing body is advised on whole-school priorities for Design and Technology in order to make informed decisions.
- Proper provision is in place for pupils with different abilities and needs, including children with special educational needs and disabilities (SEND), ensuring that all pupils can access and succeed in the Design and Technology curriculum.

The Design and Technology Subject Leader will:

- Provide professional leadership and management, ensuring staff knowledge of Design and Technology, including the design process, technical knowledge and practical skills, is kept up to date.
- Ensure the taught Design and Technology curriculum is engaging, age-appropriate, challenges all pupils and meets the aims of the National Curriculum.
- Secure high-quality teaching of Design and Technology, including the quality of medium- and long-term planning.
- Ensure high-quality resources, materials, tools and equipment, alongside opportunities for practical experiences, visitors, workshops and links with local businesses or the wider community where appropriate, are available and used effectively.
- Improve standards of learning and achievement for all pupils in Design and Technology.
- Promote Design and Technology across the school through enrichment opportunities, STEM projects, competitions, exhibitions and the celebration of pupils' work.
- Monitor the quality of teaching, learning and assessment to ensure consistency and progression across the school.
- Ensure that this policy is adhered to.

Teachers will:

Teachers will adhere to this policy and ensure that the Design and Technology curriculum they provide is consistent with the aims of this policy. They will plan and deliver high-quality lessons that develop pupils' knowledge, technical understanding and practical skills,

providing opportunities to investigate, design, make and evaluate purposeful products. Teachers will ensure that all children are challenged, supported and able to make progress regardless of their starting points, fostering creativity, resilience and confidence in solving real-world problems.

Lesson design

The lesson design should be demonstrated as follows:

- Start the unit by introducing the composite design question or design brief, giving children a clear purpose and intended outcome for their learning.
- The first lesson will focus on investigating and evaluating existing products linked to the unit theme, identifying what makes them successful and considering the needs of the user.
- The second lesson will focus on developing the technical knowledge and practical skills required for the unit, including exploring materials, components, tools and techniques.
- Subsequent lessons will build towards answering the composite design question through carefully sequenced enquiry and practical activities. These will be delivered using the agreed lesson design format: **Link It, Discover It, Think Together, Practise, Apply, Revisit**.
- Throughout the unit, children will design, make, test and refine their products, evaluating them against the design criteria and making improvements where appropriate.
- The final lesson will provide children with the opportunity to answer the composite design question by independently designing, making and evaluating a purposeful final product that demonstrates the knowledge and skills developed throughout the unit.

Inclusion

1. Teachers set high expectations for all pupils. They use appropriate assessment to set ambitious targets and plan challenging learning opportunities for pupils of all abilities, including:

- More able pupils
- Pupils with low prior attainment
- Pupils from disadvantaged backgrounds
- Pupils with SEND
- Pupils with English as an Additional Language (EAL)

a) Teachers plan lessons so that pupils with SEND can access every aspect of the Design and Technology curriculum wherever possible, ensuring there are no barriers to participation, practical learning or achievement. Appropriate adaptations, resources, equipment and levels of support are provided so that all pupils can develop their designing, making, evaluating and technical skills with confidence.

b) Teachers take into account the needs of pupils with EAL by planning lessons that develop both technical and subject-specific vocabulary alongside practical, hands-on experiences. Visual resources, demonstrations, modelling, collaborative learning and the effective use of technology support pupils in accessing the curriculum, communicating their ideas and developing their understanding of the design process.

c) For further information, please refer to the school's SEND Policy.

Impact

At Radford Academy, our pupils will have:

- Developed creativity, confidence and independence as designers and makers, using a range of materials, tools, techniques and technologies to design and create purposeful products with increasing skill and precision.
- Become reflective and resilient learners who can investigate, design, make, test and evaluate their own products and those of others using appropriate Design and Technology vocabulary.
- Gained secure knowledge and understanding of the design process, technical knowledge and the principles of structures, mechanisms, textiles, food and nutrition, electrical systems and digital technologies, recognising how Design and Technology improves everyday life.
- Developed their cultural capital through high-quality enrichment opportunities such as workshops, STEM projects, visits, visitors and opportunities to experience design, engineering and technology in real-world contexts.
- Acquired a rich technical vocabulary that enables them to confidently communicate design ideas, justify decisions, evaluate products and discuss the work of significant designers, engineers, architects, inventors and chefs.
- Developed high aspirations and an awareness of the wide range of careers within Design and Technology, including engineering, architecture, product design, construction, manufacturing, food technology, robotics and the wider STEM industries

How are our school values visible in our D&T Curriculum

Children at Radford Academy develop a sense of belonging through the Design and Technology curriculum by:



- Designing and making purposeful products that reflect their own experiences, interests, culture and community, enabling children to see themselves as creative problem-solvers.
- Exploring the work of a diverse range of designers, engineers, architects, inventors and chefs from different cultures, backgrounds and time periods, helping children to value both their own and others' contributions to innovation and design.
- Designing products that respond to real-life needs within the local community and wider world, fostering a sense of pride, responsibility and connection to the area in which they live.
- Providing opportunities to work collaboratively on design and making projects, encouraging teamwork, communication, respect and a sense of belonging within the school community.
- Encouraging children to share, explain and celebrate their ideas in a supportive environment, building confidence, self-esteem and resilience throughout the design process.
- Reinforcing British values through collaborative decision-making, respectful discussion of design ideas and consideration of different users' needs, promoting democracy, individual liberty, mutual respect and tolerance.
- Celebrating diversity and promoting the protected characteristics by studying influential designers, engineers, inventors, architects and chefs from a wide range of backgrounds, including women and individuals from different cultures and communities, helping children recognise that innovation is strengthened through diverse perspectives and that everyone can make a positive contribution to society.

Children at Radford Academy are taught aspiration through the Design and Technology curriculum by:



- Allowing children to develop the knowledge, skills and technical understanding of a designer, engineer and maker through a carefully sequenced progression of designing, making and evaluating skills.
- Introducing children to a diverse range of designers, engineers, architects, inventors and chefs, including successful women and individuals from a variety of cultures and backgrounds, helping them to recognise the wide range of careers within Design and Technology and the wider STEM industries.
- Encouraging creativity, resilience and independence by teaching children to generate ideas, take informed risks, test solutions, refine their products and learn from mistakes throughout the design process.
- Developing critical thinking, problem-solving and decision-making skills through investigating, designing, making, testing and evaluating products that solve real and relevant problems.
- Building confidence by providing opportunities to showcase, test and celebrate their products, inspiring children to take pride in their achievements and recognise their potential as innovative designers and problem-solvers.
- Helping children understand how Design and Technology skills can be applied across a wide range of future careers, including engineering, architecture, product design, construction, manufacturing, food technology, robotics, computer-aided design and the wider STEM industries.

Children at Radford Academy are taught aspiration through the Design and Technology curriculum



by:

- Allowing children to develop the knowledge, skills and technical understanding of a designer, engineer and maker through a carefully sequenced progression of designing, making and evaluating skills.
- Introducing children to a diverse range of designers, engineers, architects, inventors and chefs, including successful women and individuals from a variety of cultures and backgrounds, helping them to recognise the wide range of careers within Design and Technology and the wider STEM industries.
- Encouraging creativity, resilience and independence by teaching children to generate ideas, take informed risks, test solutions, refine their products and learn from mistakes throughout the design process.
- Developing critical thinking, problem-solving and decision-making skills through investigating, designing, making, testing and evaluating products that solve real and relevant problems.
- Building confidence by providing opportunities to showcase, test and celebrate their products, inspiring children to take pride in their achievements and recognise their potential as innovative designers and problem-solvers.
- Helping children understand how the knowledge and skills developed in Design and Technology can be applied across a wide range of future careers, including engineering, architecture, product design, construction, manufacturing, food technology, robotics, computer-aided design and the wider STEM industries.
- Encouraging children to recognise the importance of innovation, sustainability and technological advancement, inspiring them to become the next generation of designers, engineers and inventors who can make a positive difference to the world.



Children at Radford Academy are taught interaction through the Design and Technology curriculum by:

- Providing opportunities for oracy and partner talk through discussions, collaborative design tasks, peer feedback and presentations of their design ideas and finished products.
- Encouraging children to ask and answer questions about products, designers, materials, mechanisms and the design process, helping them to develop curiosity and deepen their understanding of Design and Technology.
- Using subject-specific vocabulary and modelled sentence stems to support children in discussing, explaining, evaluating and justifying their design decisions, technical knowledge and product outcomes.
- Creating opportunities for children to work collaboratively throughout the design process, sharing ideas, solving problems together, respecting different viewpoints and learning from one another.
- Encouraging children to test, evaluate and provide constructive feedback on their own and others' products, developing communication skills, confidence, critical thinking and mutual respect.



Children at Radford Academy are taught curiosity through the Design and Technology curriculum by:

- Having access to enrichment opportunities, including STEM workshops, educational visits, visiting designers, engineers and other industry professionals, alongside the use of high-quality resources and technology to inspire curiosity about design, engineering and innovation.
- Providing opportunities to ask questions about products, materials, mechanisms, designers and the design process, encouraging children to investigate how and why things work and how they can be improved.
- Building on prior learning by making links between previous design projects, technical knowledge and real-world applications, fostering a sense of curiosity about how Design and Technology shapes everyday life.
- Encouraging experimentation with a wide range of materials, tools, components and techniques, inspiring children to take informed risks, solve problems creatively and develop innovative solutions.
- Exposing children to significant innovations, technological developments and influential designers, engineers, architects, inventors and chefs from different cultures and historical periods, promoting curiosity about the world and the impact of Design and Technology on society.

Whole School Design & Technology Progression

Concept		Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Structures	Design	See separate document		• Generate ideas based on simple design criteria and their own experiences, explaining what they could make. • Develop, model and communicate their ideas through talking, mock-ups and drawings. • Plan by suggesting what to do next.		• Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and the functional and aesthetic purposes of the product. • Develop ideas through the analysis of existing shell structures and use computer-aided design to model and communicate ideas.	• Carry out research into user needs and existing products, using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide the development of their ideas and products, taking account of constraints including time, resources and cost. • Generate, develop and model innovative ideas, through discussion, prototypes and annotated sketches.	

Concept		Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Make			• Select and use tools, skills and techniques, explaining their choices. • Select new and reclaimed materials and construction kits to build their structures. • Use simple finishing techniques suitable for the structure they are creating.		• Plan the order of the main stages of making. • Select and use appropriate tools and software to measure, mark out, cut, score, shape and assemble with some accuracy. • Explain their choice of materials according to functional properties and aesthetic qualities. • Use computer-generated finishing techniques suitable for the product they are creating.	• Formulate a clear plan, including a step-by-step list of what needs to be done and lists of resources to be used. • Competently select from and use appropriate tools to accurately measure, mark out, cut, shape and join construction materials to make frameworks. • Use finishing and decorative techniques suitable for the product they are designing and making.	•

Concept		Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Evaluate			• Explore a range of existing freestanding structures in the school and local environment e.g. everyday products and buildings. • Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria.		• Investigate and evaluate a range of shell structures including the materials, components and techniques that have been used. • Test and evaluate their own products against design criteria and the intended user and purpose.	• Investigate and evaluate a range of existing frame structures. • Critically evaluate their products against their design specification, intended user and purpose, identifying strengths and areas for development, and carrying out appropriate tests. • Research key events and individuals relevant to frame structures.	•
	Technical Knowledge			• Know how to make freestanding structures stronger, stiffer and more stable. • Know and use technical vocabulary relevant to the project.		• 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 and use technical vocabulary relevant to the project.	• Understand how to strengthen, stiffen and reinforce 3-D frameworks. • Know and use technical vocabulary relevant to the project.	•

Concept		Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Vocabulary			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	•

Concept		Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Tools			photographs of various structures construction kits that can be used to construct freestanding structures e.g. walls, towers, frameworks paper, card, plastic sheet, paper and plastic straws, pipe cleaners reclaimed materials including small containers, card boxes, cotton reels string, masking tape PVA glue, Plasticine, left/right-handed scissors, hole punch, stapler finishing media and materials		collection of shell structures for different purposes and users card, squared paper, coloured paper, adhesive tape, masking tape, PVA glue, glue spreaders, acetate sheet, pencils, felt-tip pens, rulers, scissors computer with computer-aided design (CAD) software such as Techsoft 2D Primary or Microsoft Word, printer	products, photographs, web-based resources of existing frame structures card, paper straws, newspaper, square sectioned wood, masking tape, PVA glue, pencils, rulers, right/left handed scissors, bench hooks, G-clamp, junior hacksaws, glass paper finishing media and materials	•

Concept		Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Mechanisms	Design		• Generate ideas based on simple design criteria and their own experiences, explaining what they could make. • Develop, model and communicate their ideas through drawings and mock-ups with card and paper.	• Generate initial ideas and simple design criteria through talking and using own experiences. • Develop and communicate ideas through drawings and mock-ups.	• Generate realistic 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.			• Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources. • Develop a simple design specification to guide their thinking. • Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views.
	Make		• Plan by suggesting what to do next. • Select and use tools, explaining their choices, to cut, shape and join paper and card. • Use simple finishing techniques suitable for the product they are creating.	• Select from and use a range of tools and equipment to perform practical tasks such as cutting and joining to allow movement and finishing. • Select from and use a range of materials and components such as paper, card, plastic and wood according to their characteristics.	• Order the main stages of making. • Select from and use appropriate tools with some accuracy to cut, shape and join paper and card. • Select from and use finishing techniques suitable for the product they are creating.			• Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team. • Select from and use a range of tools and equipment to make products that that are accurately assembled and well finished. Work within the constraints of time, resources and cost.

Concept		Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Evaluate		• Explore a range of existing books and everyday products that use simple sliders and levers. • Evaluate their product by discussing how well it works in relation to the purpose and the user and whether it meets design criteria.	• Explore and evaluate a range of products with wheels and axles. • Evaluate their ideas throughout and their products against original criteria.	• Investigate and analyse books and, where available, other products with lever and linkage mechanisms. • Evaluate their own products and ideas against criteria and user needs, as they design and make.			• Compare the final product to the original design specification. • Test products with the intended user, where safe and practical, and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose. • Consider the views of others to improve their work. • Investigate famous manufacturing and engineering companies relevant to the project.
	Technical Knowledge		• Explore and use sliders and levers. • Understand that different mechanisms produce different types of movement. • Know and use technical vocabulary relevant to the project.	• Explore and use wheels, axles and axle holders. • Distinguish between fixed and freely moving axles. • Know and use technical vocabulary relevant to the project.	• Understand and use lever and linkage mechanisms. • Distinguish between fixed and loose pivots. • Know and use technical vocabulary relevant to the project.			• 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. • Know and use technical vocabulary relevant to the project.

Concept		Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Vocabulary		Slider, lever, pivot, slot, bridge/guide Card, masking tape, paper fastener, join Push, pull, 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			cam, snail cam, off-centre cam, peg cam, pear shaped cam follower, axle, shaft, crank, handle, housing, framework rotation, rotary motion, oscillating motion, reciprocating motion annotated sketches, exploded diagrams mechanical system, input movement, process, output movement design decisions, functionality, innovation, authentic, user, purpose, design specification, design brief

Concept		Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Tools		Books and every-day products with lever and slider mechanisms. Slider and lever teaching aids. Card strips, card rectangles, paper, masking tape, paper fasteners, glue sticks, PVA, scissors, hole punch, finishing materials and media.	selection of toy vehicles with differently fixed axles card boxes, card, cotton reels, plastic tubing, dowel, clothes pegs, paper sticks/dowel, paper/plastic straws, card discs, MDF wheels single hole punch, card drill, cutting mat, masking tape, PVA glue, paint, thin/thick paint brushes, felt tip pens, decorative paper, double sided sticky fixers, junior hacksaw, vice, scissors	books and other products with lever and linkage mechanisms lever and linkage teaching aids card strips, card rectangles, paper, masking tape, paper fasteners, paper binders, stick glue scissors, cutting mats, finishing media and materials			videos and photographs of cams, models or toys with different cam mechanisms MDF, card or wooden wheels, plastic or wooden cams, dowel, card boxes, PVA glue, glue guns, masking tape, double-sided tape, square section wood, card, corrugated plastic, foam, paper straws, finishing media • junior hacksaws, glass paper, G-clamps, bench hooks, hand drill

Whole School coverage document

Key Stage One				
Subject Content from the Programme of Study	**What are our DT themes or unit titles?** (Content may be split between themes or units)	**When are pupils being taught this?**	**Links with other subjects**	**Opportunities for pupils to apply basic skills**
<u>Design</u> Pupils should be taught to design purposeful, functional, appealing products for themselves and other users based on design criteria	Y1. Mechanisms – Moving Pictures Y1. Food – Dips & Dippers Y1. Textiles – Finger puppets Y2. Structures - Bridges Y2. Food – Packed lunch Y2. Mechanisms - Catapults	Autumn 1 Spring 1 Summer 2 Spring 2 Summer 1 Summer 2	History Science English Science History	Cutting/joining Cutting, stirring, hygiene Cutting, threading, sticking Joining Reading Cutting, joining
Pupils should be taught to generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology	Y1. Mechanisms – Moving Pictures Y1. Food – Dips & Dippers Y1. Textiles – Finger puppets Y2. Food – Packed lunch Y2. Structures - Bridges Y2. Mechanisms - Catapults	Autumn 1 Spring 1 Summer 2 Spring 2 Summer 1 Summer 2	History Science English Science History	Cutting/joining Cutting, stirring, hygiene Cutting, threading, sticking Joining Reading Cutting, joining
<u>Make</u> Pupils should be taught to select from and use a range of tools and equipment to perform practical tasks	Y1. Mechanisms – Moving Pictures Y1. Food – Dips & Dippers Y1. Textiles – Finger puppets Y2. Food – Packed lunch Y2. Structures - Bridges Y2. Mechanisms - Catapults	Autumn 1 Spring 1 Summer 2 Spring 2 Summer 1 Summer 2	History Science English Science History	Cutting/joining Cutting, stirring, hygiene Cutting, threading, sticking Joining Reading Cutting, joining
Pupils should be taught to select from and use a wide range of materials and components, including construction	Y1. Mechanisms – Moving Pictures Y1. Food – Dips & Dippers Y1. Textiles – Finger puppets	Autumn 1 Spring 1 Summer 2	History Science	Cutting/joining Cutting, stirring, hygiene Cutting, threading, sticking

materials, textiles and ingredients, according to their characteristics	Y2. Food – Packed lunch Y2. Structures - Bridges Y2. Mechanisms - Catapults	Spring 2 Summer 1 Summer 2	English Science History	Joining Reading Cutting, joining
<u>Evaluate</u> Pupils should be taught to explore and evaluate a range of existing products.	Y1. Mechanisms – Moving Pictures Y1. Food – Dips & Dippers Y1. Textiles – Finger puppets Y2. Food – Packed lunch Y2. Structures - Bridges Y2. Mechanisms - Catapults	Autumn 1 Spring 1 Summer 2 Spring 2 Summer 1 Summer 2	History Science English Science History	Cutting/joining Cutting, stirring, hygiene Cutting, threading, sticking Joining Reading Cutting, joining
Pupils should be taught to evaluate their ideas and products against design criteria.	Y1. Mechanisms – Moving Pictures Y1. Food – Dips & Dippers Y1. Textiles – Finger puppets Y2. Food – Packed lunch Y2. Structures - Bridges Y2. Mechanisms - Catapults	Autumn 1 Spring 1 Summer 2 Spring 2 Summer 1 Summer 2	History Science English Science History	Cutting/joining Cutting, stirring, hygiene Cutting, threading, sticking Joining Reading Cutting, joining

Key Stage One (cont.)

Subject Content from the Programme of Study	What are our DT themes or unit titles? (Content may be split between themes or units)	When are pupils being taught this?	Links with other subjects	Opportunities for pupils to apply basic skills
<u>Technical Knowledge</u> Pupils should be taught to build structures, exploring how they can be made stronger, stiffer and more stable.	Y2. Structures - Bridges	Summer 1	English	Joining
Pupils should be taught to explore and use mechanisms in their products.	Y1. Mechanisms – Moving Pictures Y2. Mechanisms - Catapults	Autumn 1 Summer 2	History History	Cutting/joining Cutting, joining

<u>Cooking and Nutrition</u> Pupils should be taught to use the basic principles of a healthy and varied diet to prepare dishes.	Y1. Food – Dips & Dippers Y2. Food – Packed lunch	Spring 1 Spring 2	Science Science	Cutting, stirring, hygiene Cutting, spreading, hygiene
Pupils should be taught to understand where food comes from.	Y1. Food – Dips & Dippers Y2. Food – Packed lunch	Spring 1 Spring 2	Science Science	Cutting, stirring, hygiene Cutting, spreading, hygiene

Key Stage Two				
Subject Content from the Programme of Study	**What are our DT themes or unit titles?** (Content may be split between themes or units)	**When are pupils being taught this?**	**Links with other subjects**	**Opportunities for pupils to apply basic skills**
<u>Design</u> Pupils should be taught to 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.	Y3. Food – pizza Y3 – Mechanisms – moving pictures Y3 – Textiles – Egyptian collar Y4 – Structures – tea packaging Y4 – Food – biscuits Y4 – Electrical systems – night lights Y5 – Textiles – soft toy Y5 – Food – Greek food Y5 – Structures - Greek temples Y6 – Mechanisms – Automata animals Y6 – Electrical systems – Game Y6 – Food – Mayan MasterChef	Autumn 1 Spring 1 Summer 2 Autumn 1 Spring 2 Summer 1 Autumn 2 Summer 1 Summer 2 Autumn 1 Spring 1 Summer 1	Science History English Science Science Science History History Science Science Science	Chopping/grating Folding/ cutting Pinning/ cutting/ threading Computing/ writing Weighing Problem solving Cutting/threading Chopping/ kneading Measuring/ sawing Sawing/ hot gluing Problem solving Cutting/grating/ frying
Pupils should be taught to generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.	Y3. Food – pizza Y3 – Mechanisms – moving pictures Y3 – Textiles – Egyptian collar Y4 – Structures – tea packaging Y4 – Food – biscuits Y4 – Electrical systems – night lights Y5 – Textiles – soft toy Y5 – Food – Greek food	Autumn 1 Spring 1 Summer 2 Autumn 1 Spring 2 Summer 1 Autumn 2 Summer 1	Science History English Science Science Science History	Chopping/grating Folding/ cutting Pinning/ cutting/ threading Computing/ writing Weighing Problem solving Cutting/threading Chopping/ kneading Measuring/ sawing

	Y5 – Structures - Greek temples Y6 – Mechanisms – Automata animals Y6 – Electrical systems – Game Y6 – Food – Mayan MasterChef	Summer 2 Autumn 1 Spring 1 Summer 1	History Science Science Science	 Sawing/ hot gluing Problem solving Cutting/grating/ frying
<u>Make</u> Pupils should be taught to select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately.	Y3. Food – pizza Y3 – Mechanisms – moving pictures Y3 – Textiles – Egyptian collar Y4 – Structures – tea packaging Y4 – Food – biscuits Y4 – Electrical systems – night lights Y5 – Textiles – soft toy Y5 – Food – Greek food Y5 – Structures - Greek temples Y6 – Mechanisms – Automata animals Y6 – Electrical systems – Game Y6 – Food – Mayan MasterChef	Autumn 1 Spring 1 Summer 2 Autumn 1 Spring 2 Summer 1 Autumn 2 Summer 1 Summer 2 Autumn 1 Spring 1 Summer 1	Science History English Science Science Science History History Science Science Science	Chopping/grating Folding/ cutting Pinning/ cutting/ threading Computing/ writing Weighing Problem solving Cutting/threading Chopping/ kneading Measuring/ sawing Sawing/ hot gluing Problem solving Cutting/grating/ frying
Pupils should be taught to select to 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.	Y3. Food – pizza Y3 – Mechanisms – moving pictures Y3 – Textiles – Egyptian collar Y4 – Structures – tea packaging Y4 – Food – biscuits Y4 – Electrical systems – night lights Y5 – Textiles – soft toy Y5 – Food – Greek food	Autumn 1 Spring 1 Summer 2 Autumn 1 Spring 2 Summer 1 Autumn 2 Summer 1	Science History English Science Science Science History	Chopping/grating Folding/ cutting Pinning/ cutting/ threading Computing/ writing Weighing Problem solving Cutting/threading Chopping/ kneading Measuring/ sawing

	Y5 – Structures - Greek temples Y6 – Mechanisms – Automata animals Y6 – Electrical systems – Game Y6 – Food – Mayan MasterChef	Summer 2 Autumn 1 Spring 1 Summer 1	History Science Science Science	 Sawing/ hot gluing Problem solving Cutting/grating/ frying
Key Stage Two (cont.)				
Subject Content from the Programme of Study	**What are our DT themes or unit titles?** (Content may be split between themes or units)	**When are pupils being taught this?**	**Links with other subjects**	**Opportunities for pupils to apply basic skills**
<u>Evaluate</u> Pupils should be taught to investigate and analyse a range of existing products.	Y3. Food – pizza Y3 – Mechanisms – moving pictures Y3 – Textiles – Egyptian collar Y4 – Structures – tea packaging Y4 – Food – biscuits Y4 – Electrical systems – night lights Y5 – Textiles – soft toy Y5 – Food – Greek food Y5 – Structures - Greek temples Y6 – Mechanisms – Automata animals Y6 – Electrical systems – Game Y6 – Food – Mayan MasterChef	Autumn 1 Spring 1 Summer 2 Autumn 1 Spring 2 Summer 1 Autumn 2 Summer 1 Summer 2 Autumn 1 Spring 1 Summer 1	Science History English Science Science Science History History Science Science Science	Chopping/grating Folding/ cutting Pinning/ cutting/ threading Computing/ writing Weighing Problem solving Cutting/threading Chopping/ kneading Measuring/ sawing Sawing/ hot gluing Problem solving Cutting/grating/ frying

Pupils should be taught to evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.	Y3. Food – pizza Y3 – Mechanisms – moving pictures Y3 – Textiles – Egyptian collar Y4 – Structures – tea packaging Y4 – Food – biscuits Y4 – Electrical systems – night lights Y5 – Textiles – soft toy Y5 – Food – Greek food Y5 – Structures - Greek temples Y6 – Mechanisms – Automata animals Y6 – Electrical systems – Game Y6 – Food – Mayan MasterChef	Autumn 1 Spring 1 Summer 2 Autumn 1 Spring 2 Summer 1 Autumn 2 Summer 1 Summer 2 Autumn 1 Spring 1 Summer 1	Science History English Science Science Science History History Science Science Science	Chopping/grating Folding/ cutting Pinning/ cutting/ threading Computing/ writing Weighing Problem solving Cutting/threading Chopping/ kneading Measuring/ sawing Sawing/ hot gluing Problem solving Cutting/grating/ frying
Pupils should be taught to understand how key events and individuals in design and technology have helped shape the world.	Y3. Food – pizza Y3 – Mechanisms – moving pictures Y3 – Textiles – Egyptian collar Y4 – Structures – tea packaging Y4 – Food – biscuits Y4 – Electrical systems – night lights Y5 – Textiles – soft toy Y5 – Food – Greek food Y5 – Structures - Greek temples Y6 – Mechanisms – Automata animals Y6 – Electrical systems – Game Y6 – Food – Mayan MasterChef	Autumn 1 Spring 1 Summer 2 Autumn 1 Spring 2 Summer 1 Autumn 2 Summer 1 Summer 2 Autumn 1 Spring 1 Summer 1	Science History English Science Science Science History History Science Science Science	Chopping/grating Folding/ cutting Pinning/ cutting/ threading Computing/ writing Weighing Problem solving Cutting/threading Chopping/ kneading Measuring/ sawing Sawing/ hot gluing Problem solving Cutting/grating/ frying

<u>Technical Knowledge</u> Pupils should be taught to apply their understanding of how to strengthen, stiffen and reinforce more complex structures.	Y4 – Structures – tea packaging Y5 – Structures - Greek temples	Autumn 1 Summer 2	English History	Computing/ writing Measuring/ sawing
Key Stage Two (cont.)				
Subject Content from the Programme of Study	**What are our DT themes or unit titles?** (Content may be split between themes or units)	**When are pupils being taught this?**	**Links with other subjects**	**Opportunities for pupils to apply basic skills**
Pupils should be taught to understand and use mechanical systems in their products (for example, gears, pulleys, cams, levers and linkages).	Y3 – Mechanisms – moving pictures Y6 – Mechanisms – Automata animals	Spring 1 Autumn 1	Science	Folding/ cutting Sawing/ hot gluing
Pupils should be taught to understand and use electrical systems in their products (for example, series circuits incorporating switches, bulbs, buzzers and motors).	Y4 – Electrical systems – night lights Y6 – Electrical systems – Game	Summer 1 Spring 2	Science Science	Problem solving Problem solving
Pupils should be taught to apply their understanding of computing to program, monitor and control their products.	Y4 – Structures – tea packaging	Autumn 1	English	Computing/ writing

Cooking and Nutrition Pupils should be taught to understand and apply the principles of a healthy and varied diet.	Y3. Food – pizza Y4 – Food – biscuits Y5 – Food – Greek food Y6 – Food – Mayan MasterChef	Autumn 1 Spring 2 Summer 1 Summer 1	Science Science History History	Chopping/grating Weighing Chopping/ kneading Cutting/grating/ frying
Key Stage Two (cont.)				
Subject Content from the Programme of Study	**What are our DT themes or unit titles?** (Content may be split between themes or units)	**When are pupils being taught this?**	**Links with other subjects**	**Opportunities for pupils to apply basic skills**
Pupils should be taught to prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques.	Y3. Food – pizza Y5 – Food – Greek food Y6 – Food – Mayan MasterChef	Autumn 1 Summer 1 Summer 1	Science History History	Chopping/grating Chopping/ kneading Cutting/grating/ frying
Pupils should be taught to understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.	Y3. Food – pizza Y5 – Food – Greek food Y6 – Food – Mayan MasterChef	Autumn 1 Summer 1 Summer 1	Science History History	Chopping/grating Chopping/ kneading Cutting/grating/ frying

The Foundations for Learning Design & Technology in the Early Years

In the Early Years at Radford Academy, children develop the foundations for Design and Technology through **exploring, designing, making, problem-solving and evaluating**. Children are naturally curious and enjoy finding out how things work, building, joining, creating and adapting their ideas. These experiences provide important foundations for the knowledge and skills they will develop throughout the Design and Technology curriculum.

The **Early Learning Goals (ELGs)** support this development, particularly through **Expressive Arts and Design**, **Physical Development**, **Mathematics** and **Communication and Language**.

- **Creating with Materials:** Children explore and use a variety of materials, tools and techniques. They begin to make choices about the materials they need and experiment with different ways of joining, shaping and combining them to create their own ideas.
- **Physical Development:** Children develop the fine motor control and coordination needed to use tools safely and effectively. Activities such as cutting, threading, moulding, folding, joining and manipulating materials help prepare children for more precise practical skills.
- **Mathematics:** Children develop an understanding of shape, space, measure, size and pattern through practical experiences. They begin to compare, estimate and measure materials and consider how shapes and objects can be used when designing and making.
- **Communication and Language:** Children learn to explain their ideas, describe what they are making and talk about the materials and tools they have chosen. They develop vocabulary that helps them communicate their thinking and solve problems with others.
- **Being Imaginative and Expressive:** Children use their imagination to develop and create their own designs. They are encouraged to explore possibilities, make decisions and adapt their ideas as they work.
- **Understanding the World:** Children begin to notice how everyday objects are made and how they are used. They explore the properties of different materials and start to understand that materials can be changed, combined and used for different purposes.

The Early Years provides children with the **practical experiences, curiosity and problem-solving skills that form the foundations for Design and Technology in Key Stage 1**. Through opportunities to design, make, explore and improve, children begin to understand that they can use their ideas and skills to create things that have a purpose and solve problems.

How do we assess in Primary Design and Technology?

During the lesson sequence

The lesson design sequence enables teachers to assess children's knowledge, understanding, technical knowledge and practical skills at three planned points. Teacher assessment is continuous throughout the lesson through observation, discussion and feedback as children engage in the design process.

- The first point of assessment is during the Link It activity. This activity revisits previous knowledge, vocabulary, technical concepts, materials or design skills and links to the key concepts within the Design and Technology curriculum to ensure children have retained prior learning. If it is clear that the majority of children have not retained previous learning, the teacher will revisit and model the key concepts before moving on. If only a small number require further support, this will be addressed during the lesson through targeted teacher intervention.
- The second point of assessment takes place after the Practise It stage of the lesson. Children demonstrate their understanding by applying a new practical skill or technical concept and answering carefully planned retrieval or vocabulary questions through discussion, mini whiteboards or quizzes where appropriate. Teachers also assess children's practical application through observation as they safely and accurately use tools, materials and equipment. If the majority of children are not yet secure, the teacher will revisit the teaching before moving on. Where only a small number require support, they will receive additional guidance and modelling.
- The final assessment point occurs during the Review It stage. Children evaluate their design decisions, practical skills and finished products against the design criteria, using subject-specific vocabulary to explain how their product meets the intended purpose and identifying possible improvements. Teachers identify any children who require further support, and these pupils receive additional pre-teaching or intervention before the next lesson in the sequence.

After the unit

At the end of the unit, children independently design, make and evaluate a final product that demonstrates the knowledge, technical understanding and practical skills taught throughout the sequence. They evaluate their product against the original design criteria, explaining and justifying their design decisions using subject-specific vocabulary. Teachers assess children's work against the intended learning outcomes, considering both the quality of the final product and the effectiveness of the design, making and evaluation process. Judgements are recorded on DCPro. Children who have not yet achieved Age-Related Expectations (ARE) are identified so that appropriate support and opportunities for further practice can be planned.