

DT at Springfield

Our Vision

Design and Technology is an inspiring, rigorous and practical subject. At Springfield, we value the creative curriculum and believe that it can have a powerful and positive effect on children, helping them to become confident, creative learners who are able to express their individual interests, thoughts and ideas.

We encourage the 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 make links to designs and designers throughout history, providing opportunities for children to critically reflect upon and evaluate others' designs and the overall effectiveness of the product before evaluating their own. As pupils progress, we support them to be able to think critically and develop a more rigorous understanding of the discipline of design and technology.

Through DT work in the classroom, the children at Springfield have the opportunity to develop their skills in mechanisms, structures, textiles, mechanical systems, electrical systems and cooking and nutrition. These areas are developed continuously throughout the school from foundation stage through to year six and the children have the opportunity to revisit skills from previous years before learning new ones. We encourage children to express individuality in their work and to keep their own personalised sketchbooks where they can explore ideas, be inventive and take risks. When children leave Springfield, we expect them to have a wide range of well-developed skills in the six areas of our curriculum that they can then build on and develop further as they continue in their education.

How we plan for and teach DT

At Springfield, DT is taught every other half term with key skills alternating in each year group. Teachers plan sequences of lessons across the half term that will build on and develop the children's skills culminating in a final piece.

The skills and knowledge that children will develop throughout each DT topic are mapped across each year group and across the school to ensure progression. The teaching of DT across the school follows the National Curriculum through the use of the high-quality resources from *Kapow*. Children design products with a purpose in mind and an intended user of the products. Food technology is taught across the school with children developing an understanding of where food comes from, the importance of a varied and healthy diet and how to prepare this. The *Kapow* resource supports teachers to develop excellent subject knowledge in DT.

The teaching of DT follows the design, make and evaluate cycle, with technical knowledge and relevant vocabulary shared at each stage. The design process is always linked to real life, relevant contexts to give meaning to the learning. When making their products, the children are given choice and a wide range of tools and materials to choose from. When evaluating, the children are taught to evaluate their own products against the initial design criteria to see how well it has met the needs and wants of the intended user and to identify any changes that could be made.

How we evaluate learning in DT

The impact of our DT curriculum can clearly be seen in the children's sketchbooks which pass on with them to the following year group. At the beginning of each unit, a detailed overview outlines the main learning objective alongside the skills that the children will build on and those which will follow. The opportunity to evaluate and reflect on the learning is planned for towards the end of the unit to enable the children to see how their learning is progressing and where they need to take it next. On completion of the unit of work, key assessment targets are identified and the children are able to self-assess against them. Class teachers then use the children's research and preparatory work, along with the final piece in order to make a judgement as to whether each child is working towards, at or above the expected level.

EYFS

Cooking and Nutrition

Mechanisms

Structures

Our pedagogy, which sees adults follow the children's lead during significant chunks of the day during 'free flow', ensures all staff are expert at developing children's design and technology skills through routines and child-led play.

In Nursery and Reception, we focus on children developing a foundational understanding of where food comes from, the importance of a varied and healthy diet and how to prepare this. We do this through a menu of varied experiences across the year, which include:

-children helping to wash, prepare and serve fruit at snack time (throughout the year)

Nursery:

- making and eating birthday cakes (Autumn 1)
- making and eating porridge (Autumn 2)
- making and eating a frozen juice (Spring 1)
- preparing and eating fruit salad (Spring 2)
- making and eating Easter 'nest' cakes (Spring 2)
- making and eating yam (Summer 2)
- harvesting and tasting beans and cherries from the Nursery garden (Summer 2).

Reception:

- making and eating gingerbread people (Autumn 1)
- making and eating potato Latkes (Hanukkah- Autumn 2)
- Easter baking (Spring 2)
- planting, caring for and harvesting strawberry plants to taste (Summer 2)
- prepare and eat Indian cuisine e.g. chapati (Summer 2)

In Nursery and Reception, we focus on children having an experiential understanding of working mechanisms through play. We do this through a menu of varied experiences across the year, which include:

- working pulleys in the sandpit and in Forest school.
- rolling tyres
- exploring vehicles with ramps
- building using construction kits including wheels
- adult-supported play with cogs, screws and levers

In Nursery and Reception, we focus on children having an experiential understanding of designing and creating structures through play. We do this through a menu of varied experiences across the year, which include:

- junk modelling
- building dens in the Forest
- large construction using blocks, tyres, rope, materials and pegs
- investigation of structure using clay and playdough
- experimenting with structure using construction kits including lego, magnetic tiles etc.
- small construction using small blocks and loose parts

Year 1: DT Curriculum Map

Planning and Evaluating

Generating Ideas & Making

Evaluating

- Explain what is being made and who it is for
- Use simple design criteria to help develop ideas
- Generate ideas by drawing on own experiences and knowledge
- Select from a range of tools and equipment, explaining their choices
- Follow rules for safety and hygiene

- Talk about design ideas and what they are making
- Make simple judgements on their product based on the criteria
- Suggest improvements that could be made

Unit	Structures Constructing a Windmill	Mechanisms Wheels & Axles	Cooking & Nutrition Fruit & Vegetables
Overview	In this unit, the children will begin to learn about simple freestanding structures. They will explore different types of windmills and find out about the main features. They will design a windmill to fit the design criteria before constructing their model, thinking about the best joining techniques to use. Once completed, they will judge how effective their design has been.	In this unit, the children will begin to learn about simple mechanisms. They will experiment with a range of vehicles with wheels and axles before designing and making their own vehicle with free running wheels. The children will experiment with different types of axle and axle holders before selecting which one to use in their design. Once their vehicle has been tested, they will evaluate how well it suits the needs of the users before thinking of what they would do differently next time.	In this unit, the children will begin to learn about basic cooking methods and nutrition. They will begin by exploring where a range of fruit and vegetables come from before deciding which ones to use in a simple recipe. They will then learn how to prepare the fruit and vegetables safely and hygienically to create a fruit smoothie before evaluating the final product and suggesting improvements which could be made.
Key Skills	<ul style="list-style-type: none"> • Fold, tear and cut paper and card# • Curl paper • Roll paper to create tubes • Use recycled materials • Make structures more stable by giving them a wide base • Cut along lines, straight and curved • Investigate joining techniques with different materials 	<ul style="list-style-type: none"> • Make vehicles with construction kits which contain free running wheels e.g. tubes, dowel, cotton reels • Attach wheels to a chassis using an axle and axle holder • Join appropriately for different materials and situations e.g. glue or tape • Mark out materials to be cut using a template • Use appropriate vocabulary 	<ul style="list-style-type: none"> • Understand that all food comes from plants or animals. • Develop a food vocabulary using taste, smell and texture. • Group familiar food products e.g. fruit and vegetables. • Grate and peel a range of ingredients. • Work safely and hygienically. • Measure and weigh food items (non-statutory measures e.g. spoons, cups). • Prepare simple dishes safely and hygienically without a heat source.
Outcome	Construct a freestanding windmill	Construct a moving vehicle	Make a fruit smoothie
Vocabulary	Axle, structure, strong, windmill, stable, weak, freestanding, turbine	Mechanism, vehicle, chassis, wheel, axle, axle holder, design criteria, evaluate	Fruit, vegetable, seed, vine, smoothie, healthy
Kapow unit to support	Key Stage 1 > Year 1 > Structures: Constructing a windmill > Lessons 1-4	Key Stage 1 > Year 1 > Mechanisms: Wheels & axles > Lessons 1-2	Key Stage 1 > Year 1 > Food: Fruit & Vegetables > Lessons 1-4

Year 2: DT Curriculum Map

Planning and Evaluating

Generating Ideas & Making

Evaluating

- Explain what is being made and who it is for
- Use simple design criteria to help develop ideas then build on them using own experiences and knowledge
- Explain how you will make product suitable for the intended user
- Select from a range of tools and equipment, explaining your choices
- Follow the rules for safety and hygiene

- Talk about design ideas and what you are making
- Make simple judgements on your product based on the criteria
- Suggest improvements that could be made

Unit	Textiles Pouches	Mechanisms Making a Moving Monster	Cooking & Nutrition A balanced diet
Overview	In this unit, the children will begin to develop their textiles skills. They will practice how to tread a needle and sew a running stitch. They will learn about and create templates for a fabric pouch before cutting out the fabric pieces and sewing them together. Finally, they will decorate their pouch using felt shapes before evaluating its effectiveness against the design criteria.	In this unit, the children will continue to learn about simple mechanisms. They will look at everyday objects to explore levers, linkages and pivots. They will experiment with making linkages that could be used to create a moving monster. They will design and construct a moving monster following design criteria. Once they have completed their moving monster, they will evaluate how successful their design has been.	In this unit, the children will continue to learn about different cooking methods and nutrition. They will explore what makes a healthy diet by exploring the Eatwell Plate. They will investigate a range of food combinations to find the best flavour for a healthy wrap. They will then prepare the ingredients safely and hygienically before evaluating their wrap to see if it could be improved and what they would do differently next time.
Key Skills	<ul style="list-style-type: none"> • Create own templates for fabric shapes • Cut out shapes which have been created by drawing round a template onto the fabric • Join fabrics by using running stitch and over-sewing • Decorate fabrics with buttons, beads, sequins, braids, ribbons 	<ul style="list-style-type: none"> • Make moving pictures using simple levers and linkages • Cut along straight and curved lines • Use a hole punch to create slots • Use paper fasteners to create movement • Cut slots under supervision • Join appropriately for different materials and situations e.g. glue or tape • Use appropriate vocabulary 	<ul style="list-style-type: none"> • Develop a food vocabulary using taste, smell and texture. • Name and sort food into the five groups on The Eatwell plate. • Grate, peel and chop a range of ingredients. • Work safely and hygienically. • Measure and weigh food items using simple standard measures (e.g. cups, spoons). • Prepare simple dishes safely and hygienically without a heat source.
Outcome	Make a fabric pouch	Create a moving monster	Make a wrap
Vocabulary	Fabric, template, thread, needle, running stitch, knot, pouch, decorate	Linkage, lever, mechanism, pivot, axle, mechanical, input, output	Fruit, vegetable, dairy, protein, sugar, balanced diet, recipe, wrap
Kapow units to support	Key Stage 1 > Year 2 > Textiles: Pouches > Lessons 1-4	Key Stage 1 > Year 2 > Mechanisms: Making a moving monster > Lessons 1-4	Key Stage 1 > Year 2 > Food: A balanced diet > Lessons 1-4

Year 3: DT Curriculum Map

Planning and Evaluating

Generating Ideas & Making

- Gather information about the needs and wants of particular individuals and groups
- Model ideas using prototypes and pattern pieces
- Use annotated sketches and diagrams to develop and communicate ideas
- Select tools, equipment and materials suitable for the task and be able to explain the choice according to functional properties and aesthetic qualities
- Assemble, join and combine materials and components with some accuracy

Evaluating

- Identify the strengths and areas for development in their ideas and products
- Discuss how well the finished product meets the design criteria
- Consider the views of others, including intended users, to improve their work
- Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products

Unit	Structures Constructing a Castle	Mechanical Systems Pneumatic toys	Cooking & Nutrition Eating Seasonally
Overview	In this unit, the children will continue to find out about structures. They will design a castle following a design specification, before investigating different materials and 3D shapes that could be used to create their castle. They will make nets to create the 3D shapes before investigate different methods to join and strengthen their structures. The final castle will be evaluated against the design criteria.	In this unit, the children will begin to learn about simple mechanical systems. They will investigate and explore different pneumatic systems and how they work before designing their own pneumatic toy through thumbnail sketches and exploded diagrams. They will then create their moving toy before decorating it and testing it against the design criteria.	In this unit, the children will continue to learn about a healthy and varied diet as well as seasonality and how it affects food availability. They will understand that we need to eat a variety of different food and drink in order to stay healthy. They will be able to follow a recipe and begin to understand that a recipe can be adapted and changed due to availability. They will be able to safely and hygienically prepare food using a range of techniques.
Key Skills	<ul style="list-style-type: none"> • Cut accurately and safely along a marked line • Choose materials based on their functional properties and aesthetic qualities • Investigate joining techniques with different materials • Investigate strengthening methods 	<ul style="list-style-type: none"> • Use a combination of pneumatics and linkages to create a moving object • Experiment with pivots • Use paper fasteners to create movement • Use syringes and squeeze bottles to create movement • Cut accurately and safely along a marked line • Use appropriate vocabulary 	<ul style="list-style-type: none"> • Develop sensory vocabulary and knowledge using, smell, taste, texture and touch. • Know that a healthy diet is made up from a variety of different food and drink, as on The Eatwell plate. • Know that a recipe can be adapted by adding or substituting one or more ingredients. • Follow a recipe. • Grate, peel, chop, mix and spread a range of ingredients. • Work safely and hygienically. • Measure and weigh ingredients appropriately. • Understand that the seasons may affect food availability.
Outcome	Construct a 3D castle	Create a pneumatic toy	Make a tart using seasonal ingredients
Vocabulary	Structure, castle, net, tab, strengthen, stable, 2D, 3D	Pneumatics, linkage, thumbnail sketch, exploded diagram, paper fastener, syringe, tubing, mechanism	Processed, reared, seasonal, imported, ingredients, recipe, natural, savoury
Key event/person		John Boyd Dunlop (1840 – 1921) Invented the first pneumatic tyre	
Kapow unit to support	Lower Key Stage 2 > Year 3 > Mechanical systems: Pneumatics > Lessons 1-4	Lower Key Stage 2 > Year 3 > Structures: Constructing a castle > Lesson 1-4	Lower Key Stage 2 > Year 3 > Food: Eating seasonally > Lessons 1-4

Year 4: DT Curriculum Map

Planning and Evaluating

Generating Ideas & Making

- Gather information about the needs and wants of particular individuals and groups
- Model ideas using prototypes and pattern pieces
- Use annotated sketches and diagrams to develop and communicate ideas
- Select tools, equipment and materials suitable for the task and be able to explain the choice according to functional properties and aesthetic qualities
- Assemble, join and combine materials and components with some accuracy

Evaluating

- Identify the strengths and areas for development in their ideas and products
- Discuss how well the finished product meets the design criteria
- Consider the views of others, including intended users, to improve their work
- Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products

Unit	Electrical Systems Torches	Textiles Stuffed toys	Cooking & Nutrition Adapting a recipe
Overview	In this unit, the children will begin to learn about simple electrical systems to create a torch. They will explore and construct simple electrical circuits using bulbs, switches and buzzers. They will then analyse different torch designs before designing their own to fit a design specification. They will then build the electrical circuit and torch housing before evaluating it against the design criteria.	In this unit, the children will continue to develop their textiles skills. They will design a stuffed toy before creating a template. The template will be used to cut out 2D shapes which will then be joined together, using a range of stitches, to create a 3D toy. They will then think about different decoration techniques and choose the most appropriate for their design. (Year 5 Kapow lesson)	In this unit, the children will continue to develop their cooking skills. They will follow a simple biscuit recipe before they experiment with adapting the recipe by adding different ingredients to see which they prefer. The children will then be given a budget to work within to decide on the ingredients for their final biscuit recipe.
Key Skills	<ul style="list-style-type: none"> • Construct simple electrical circuits using bulbs, switches and buzzers • Understand how to find a fault in a circuit and how to correct it • Work safely with the resources • Know and use technical vocabulary relevant to the project 	<ul style="list-style-type: none"> • Create 3D products using pattern pieces • Cut out shapes which have been created by drawing round a template onto the fabric • Understand seam allowance • Join fabrics using running stitch, over sewing and back stitch • Use appropriate decoration techniques e.g. glued appliqué 	<ul style="list-style-type: none"> • Analyse the taste, texture, smell and appearance of a range of foods. • Know that food is grown, reared and caught in the UK, Europe and wider world. • Follow a recipe. • Grate, peel, chop, mix, spread, slice, knead and bake a range of ingredients. • Make healthy eating choices from and understanding of a balanced diet. • Work safely and hygienically. • Measure and weigh ingredients using scales. • Understand that the seasons may affect food availability.
Outcome	Make a torch	Make a soft toy (Year 5 Kapow lesson)	Create own biscuit from adapted recipe
Vocabulary	Switch, circuit, battery, bulb, buzzer, insulator, conductor, LED	Template, fabric, 2D, 3D, running stitch, cross stitch, appliqué, decoration	Adapt, recipe, utensils, ingredients, hygienically, budget, flavour combination, evaluate
Key event/person			Nadiya Hussain (1984 – present) British chef, author and winner of the 2015 Great British Bake Off
Kapow units to support	Lower Key Stage 2 > Year 4 > Electrical Systems: Torches > Lessons 1-4	Upper Key Stage 2 > Year 5 > Textiles: Stuffed toy > Lessons 1-4	Lower Key Stage 2 > Year 4 > Food: Adapting a recipe > Lessons 1-4

Year 5: DT Curriculum Map

Planning and Evaluating

Generating Ideas & Making

- Carry out research, using surveys, interviews, questionnaires and web-based resources
- Identify the needs/wants/preferences and values of individuals and groups designing for
- Model their ideas using prototypes and pattern pieces
- Use computer-aided design to develop and communicate their ideas
- Select tools, equipment and materials suitable for the task and be able to explain their choice according to functional properties and aesthetic qualities
- Accurately assemble, join and combine materials and components
- Use techniques that involve a number of steps

Evaluating

- Identify the strengths and areas for development in their ideas and products
- Consider the views of others, including intended users, to improve their work
- 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
- Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products

Unit	Structures Bridges	Mechanical Systems Automata Toys	Cooking & Nutrition What could be healthier?
Overview	In this unit, the children will continue to develop their understanding of structures. They will investigate different types of bridges, exploring how different shapes can affect a bridge's strength. They will make a prototype to test their design before using their wood work skills to create a frame structure with diagonal struts to strengthen.	In this unit, the children will continue to develop their understanding of mechanical systems. They will find out how to use cams to create movement. They will design and build frameworks using a range of materials to support their mechanisms and they will begin to learn how to use a range of tools safely. (Year 6 Kapow lesson)	In this unit, the children will continue to develop their knowledge of cooking and nutrition. They will learn about how beef is farmed and the main welfare issues that surround the rearing of cattle. They will then research and modify a traditional Bolognese recipe to make it healthier before cooking their new improved versions.
Key Skills	<ul style="list-style-type: none"> • Prototype shell structures • Create frame structures • Make structures more stable by giving them a wide base • Strengthen shells with diagonal struts • Choose materials based on their functional properties and aesthetic qualities • Measure and mark square section, strip and dowel accordingly to 1cm • Use glue gun with close supervision (one to one) • Investigate joining techniques 	<ul style="list-style-type: none"> • Use a cam to make an up and down mechanism • Build frameworks using a range of materials e.g. wood or card to support mechanisms • Join appropriately using appropriate methods • Use a bradawl to mark hold positions • Use a hand drill to drill holes • Cut strip wood, dowel, square section wood accurately • Use appropriate vocabulary 	<ul style="list-style-type: none"> • Prepare food products controlling the temperature of the oven/hob if cooking. • Measure and weight accurately using different equipment. • Cut and shape ingredients using appropriate tools and equipment e.g. grating, chopping. • Work safely and hygienically. • Show awareness of a healthy diet from an understanding of a balanced diet. • Understand the importance of correct storage and handling of ingredients. • Understand that the seasons may affect food availability.
Outcome	Make a model bridge	Create an automata toy (Year 6 Kapow lesson)	Create a healthy Bolognese sauce
Vocabulary	Materials, struts, aesthetic, strengthen, frame structure, reinforce, prototype, stable	Automata, accurate, exploded diagram, cross-sectional diagram, cam, follower, topper, mechanism	Reared, processed, ingredients, healthy, balanced diet, ethical, recipe, adapt
Key event/person	Isambard Kingdom Brunel (1806 – 1859) English civil engineer Zaha Hadid (1950 – 2016) British-Iraqi architect, artist and designer		
Kapow units to support	Upper Key Stage 2 > Year 5 > Structures: Bridges > Lessons 1-4	Upper Key Stage 2 > Year 6 > Mechanical systems: Automata toys > Lessons 1-4	Upper Key Stage 2 > Year 5 > Food: What could be healthier? > Lessons 1-4

Year 6: DT Curriculum Map

Planning and Evaluating

Generating Ideas & Making

- Carry out research, using surveys, interviews, questionnaires and web-based resources
- Identify the needs/wants/preferences and values of individuals and groups designing for
- Sketch and model alternative ideas
- Develop one idea in depth
- Select tools, equipment and materials suitable for the task and be able to explain their choice according to functional properties and aesthetic qualities
- Accurately assemble, join and combine materials and components
- Use techniques that involve a number of steps

Evaluating

- Identify the strengths and areas for development in their ideas and products
- Consider the views of others, including intended users, to improve their work
- 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
- Know about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products

Unit	Cooking and Nutrition Three-Course Meal	Textiles Waistcoats	Electrical Systems Steady hand game
Overview	In this unit, the children will continue to develop their understanding of cooking and nutrition by researching and preparing a three-course meal. They will research the journey of their main ingredient from 'farm to fork' before using a range of methods and equipment to safely and hygienically prepare their meal.	In this unit, the children will continue to develop their textile skills. They will understand about pattern layout and will pin and tack pieces of fabric together before joining them with a range of stitches. They will decorate the fabric and explore different types of fastenings and decoration.	In this unit, the children will continue to develop their understanding of electrical systems. They will design and make a steady hand game. They will use nets to create their base and their knowledge of electrical circuits to build a circuit with a buzzer which sounds when the handle makes contact with the wire frame.
Key Skills	<ul style="list-style-type: none"> • Prepare food products taking into account the properties of ingredients and sensory characteristics • Measure and weight accurately using different equipment. • Cut and shape ingredients using appropriate tools and equipment e.g. grating, chopping. • Work safely and hygienically. • Show awareness of a healthy balanced diet. • Understand that different food and drink contains different substances needed for health. • Understand how food is processed into ingredients that can be eaten or used in cooking. 	<ul style="list-style-type: none"> • Understand pattern layout • Decorate textiles appropriately often before joining components • Pin and tack fabric pieces together • Join fabrics using over sewing, back stitch, blanket stitch or machine stitching • Combine fabrics to create more useful properties • Explore fastenings and recreate some e.g. sew on buttons and make loops 	<ul style="list-style-type: none"> • Construct electrical circuits using bulbs, switches and buzzers • Test circuit and make adjustments where needed • Work safely with the resources • Know and use technical vocabulary relevant to the project
Outcome	Create a three course meal	Make a waistcoat	Make a steady hand game
Vocabulary	Reared, caught, farmed, processed, utensils, ingredients, healthy, varied	Tack, pin, pattern layout, fastenings, seam, seam allowance, template, pattern	Electromagnetic, modify, homopolar, bulb, switch, buzzer, net, control
Key event/person		The invention of the Spinning Jenny (1764) A multi-spindle spinning frame that helped to develop the industrialisation of textile manufacturing during the early Industrial Revolution.	Thomas Edison (1847 – 1931) American inventor and businessman who developed early versions of the electric lightbulb.
Kapow units to support	Upper Key Stage 2 > Year 6 > Food: Come dine with me > Lessons 1-4	Upper Key Stage 2 > Year 6 > Textiles: Waistcoats > Lessons 1-4	Upper Key Stage 2 > Year 6 > Electrical systems: Steady hand game > Lessons 1-4