Design and Technology

Skills Progression

Key Stage 1 National Curriculum Expectations

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home and school, gardens and playgrounds, the local community, industry and the wider environment].

When designing and making, pupils should be taught to:

Design

- design purposeful, functional, appealing products for themselves and other users based on design criteria
- generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology

Make

- select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]
- select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics

Evaluate

- explore and evaluate a range of existing products
- evaluate their ideas and products against design criteria

Technical knowledge

- build structures, exploring how they can be made stronger, stiffer and more stable
- explore and use mechanisms [for example, levers, sliders, wheels and axles], in their products.

Key Stage 2 National Curriculum Expectations

Through a variety of creative and practical activities, pupils should be taught the knowledge, understanding and skills needed to engage in an iterative process of designing and making. They should work in a range of relevant contexts [for example, the home, school, leisure, culture, enterprise, industry and the wider environment].

When designing and making, pupils should be 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 and exploded 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], 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

- 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 [for example, gears, pulleys, cams, levers and linkages]
- understand and use electrical systems in their products [for example, series circuits incorporating switches, bulbs, buzzers and motors]
- apply their understanding of computing to program, monitor and control their products

Design and Technology at Berrycoombe

At Berrycoombe School, Design and Technology offers a coherently planned sequence of lessons to help teachers ensure they have progressively covered the skills and concepts required in the National Curriculum. Berrycoombe School's Design and Technology aims to develop these key design skills and concepts, which are revisited throughout different units, throughout a pupil's time at Berrycoombe: design, make and evaluate.

design

make

evaluate

1. Design

KS1 Design and Technology National Curriculum:
design purposeful, functional, appealing products for themselves and other users based on design criteria; and, generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.

By the end of KS1 child will be able to:

1. Use knowledge of existing products to support plans for a similar product.

2. Describe, explore and investigate products that have been disassembled.

3. Use construction kits, pictures, templates, mock ups and captions to plan and design.

4. Talk about and describe the tools and materials needed in order complete the key tasks within a plan.

KS1 Design and Technology National Curriculum:
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

By the end of LKS2 child will be able to:

1. Use research to develop design criteria that are fit for purpose.

2. Disassemble products and describe in detail their functions.

3. Use annotated sketches, cross-sectional, exploded diagrams and increasingly complex prototypes.

4. Support discussions about ideas, plans and designs with relevant information.

KS1 Design and Technology National Curriculum:
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

By the end of UKS2 child will be able to:

1. Clarify and justify plans, designs and ideas by drawing upon and using a range of relevant sources of information.

2. Produce detailed designs and plans drawn to scale from a range of viewpoints, using pattern pieces and computer-aided design packages effectively.

3. Discuss ways in which ideas, plans and designs are formed and modify to ensure that the design criteria are met effectively.

2. Make 

KS1 Design and Technology National Curriculum:
Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]. Select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics

By the end of KS1 child will be able to:

1. Explore and talk about the characteristics of an increasing range of materials.

2. Select and use simple tools to cut and join a range of materials.

3. Use a straight edge to mark lines for cutting.

4. Join edge to edge using glue.

5. Curl paper.

6. Use a hole punch and stapler.

7. Select from a range a finish to improve the appearance of a product.

8. Follow, with adult support, procedures for safety and hygiene.

KS2 Design and Technology National Curriculum:
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

By the end of LKS2 child will be able to:

1. Select from and use a wide range of materials and components according to both functional and aesthetic qualities.

2. Select and use tools and equipment to measure, mark out and shape materials and components.

3. Use a hack saw and bench hook safely. Insert paper fasteners for card linkages.

4. Make increasingly complex paper models, mock-ups and templates.

5. Select the most effective finish to enhance the appearance of a product.

6. Independently follow procedures for safety and hygiene.

KS2 Design and Technology National Curriculum:
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

By the end of UKS2 child will be able to:

1. Select a range of appropriate tools to cut, shape and join materials and components with accuracy and precision.

2. Use an increasing range of tools and equipment to measure, mark out and shape materials and components accurately.

3. Use a drill to make an off-centre hole. Join and combine a range of materials and components using the most effective permanent and temporary way.

4. Make and adapt where necessary complex mock-ups and templates.

5. Identify and apply an appropriate finishing technique to ensure a high quality end product which meeting the design criteria.

6. Confidently follow procedures for safety and hygiene.

3. Evaluate

KS1 Design and Technology National Curriculum:
Explore and evaluate a range of existing products. Evaluate their ideas and products against design criteria

By the end of KS1 children will be able to:

1. Talk about and describe key features of a range of products.

2. Explore and evaluate a range of existing products.

3. Begin to evaluate the success of the product in terms of function and aesthetic criteria.

4. Explore and talk about products made by famous inventors, designers, engineers, chefs and manufacturers, e.g. the vacuum cleaner.

KS2 Art and Design National Curriculum:
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

By the end of LKS2 child will be able to:

1. Investigate and begin to analyse a range of existing products.

2. Use knowledge of similarities and differences between products with the same function to support identification of most effective product.

3. Evaluate ideas and products against own design criteria, taking into account the views of others.

4. Understand of the way in which the work of famous inventors, designers, engineers, chefs and manufacturers have impacted on the development of product design and function, e.g. Dyson use to inform and support evaluation and further development of own product.

KS2 Art and Design National Curriculum:
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

By the end of UKS2 child will be able to:

1. Use analysis of existing products supported by accurate factual information to inform own work.

2. Test and evaluate products to identify the variants which may affect the function of a product.

3. Give reasons, supported by factual evidence for the success of aspects of a product and provide considered solutions to resolve those parts that could be improved.

4. Relate the work of famous designers, engineers, chefs, technologists and manufactures to own products and designs.

Our D&T Journey

Intent . . . We Can, We Will

- *ALL* Children Make Exceptional Progress
- Literacy is the Key to Unlocking Learning
- Fun with Memorable Moments
- Feeling Safe and Ready to Learn
- Empowered and Autonomous
- Kind to Self and Others

→ **All Pupils**

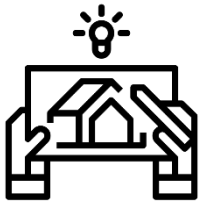
Content

At Berrycoombe School, Design and Technology offers a coherently planned sequence of lessons to help teachers ensure they have progressively cover the skills and technical knowledge required in the National Curriculum. Berrycoombe School's Design and Technology aims to develop this technical knowledge, which the different areas of are revisited throughout different units, throughout a pupil's time at Berrycoombe: Axles, Pulleys and Gears; Electrical and Mechanical Components; Food Technology; Mechanisms; Structures; and, Textiles. Lesson sequences are designed in this structure:

1. Research Product(s)

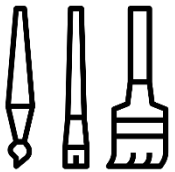
2. Decontextualised Learning of new skill(s)

3. Design Product



4. Make Product

5. Finish Product



6. Evaluate Product

Content

Nursery

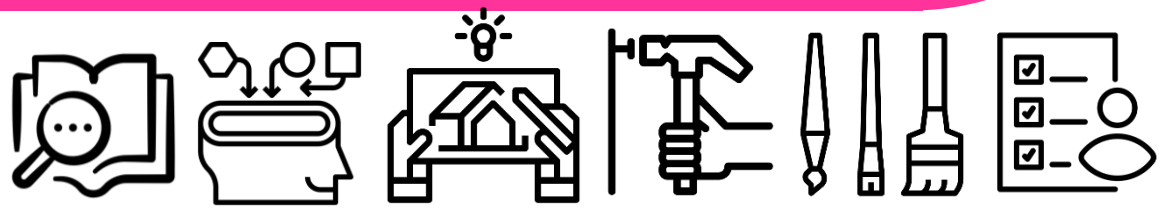
Physical Development
Use large-muscle movements to wave flags and streamers, paint and make marks.
Choose the right resources to carry out their own plan.
Use one-handed tools and equipment, for example, making snips in paper with scissors.

Nursery

Understanding the World
Explore how things work.

Expressive Arts and Design
Make imaginative and complex 'small worlds' with blocks and construction kits, such as a city with different buildings and a park.
Explore different materials freely, in order to develop their ideas about how to use them and what to make.
Develop their own ideas and then decide which materials to use to express them.
Create closed shapes with continuous lines, and begin to use these shapes to represent objects..

Nursery



Content

Year R

Physical Development
Progress towards a more fluent style of moving, with developing control and grace.
Develop their small motor skills so that they can use a range of tools competently, safely and confidently.
Use their core muscle strength to achieve a good posture when sitting at a table or sitting on the floor.

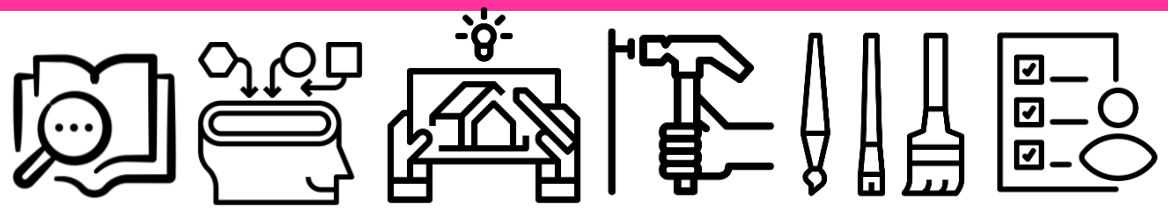
Year R

Expressive Arts and Design
Explore, use and refine a variety of artistic effects to express their ideas and feelings.
Return to and build on their previous learning, refining ideas and developing their ability to represent them.
Create collaboratively, sharing ideas, resources and skills.

Year R

Physical Development – ELG
Use a range of small tools, including scissors, paintbrushes and cutlery.

Expressive Arts and Design – ELG
Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.
Share their creations, explaining the process they have used.



Content

Animals
TK Area: Food technology
Product: Fruit salad
Baker: Mary Berry

Big Build
TK Area: Structures
Product: House
Architect: Christopher Wren

Year 1/2

Year 1/2

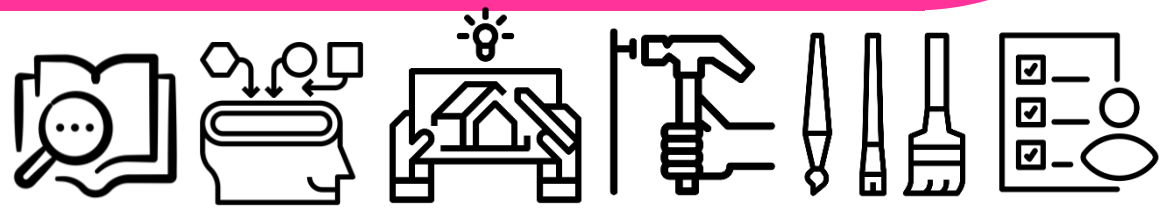
Transport
TK Area: Axis, Pulleys and Gears
Product: Hot Wheels
Inventor: Elliot Handler

Home and Away
TK Area: Electrical and Mechanical Components
Product: Lighthouse
Inventor: Robert Stevenson

Castles
TK Area: Mechanisms
Product: Castle with a working drawbridge
Designer:

Sensational Safari
TK Area: Textiles
Product: Animal hand puppet
Designer: Talk to the hand (puppets)

Year 1/2



Content

Year 3/4

Rainforests
TK Area: Electrical and Mechanical Components
Product: Electric Fan
Inventor: Philip Diehl

Romans
TK Area: Food Technology
Product: Bread
Baker: Paul Hollywood

Vikings
TK Area: Axis, Pulleys and Gears
Product: Cable Ferry
Engineer: William Pitt

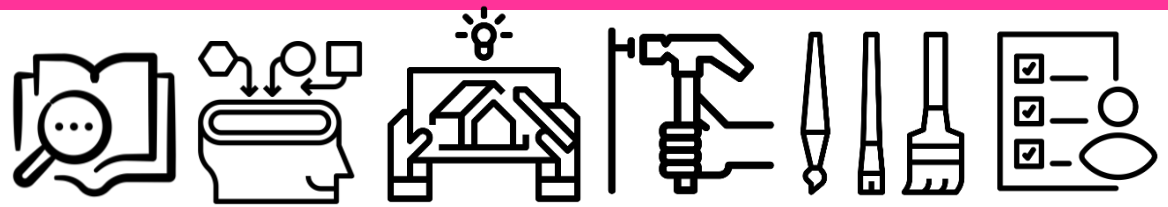
Sporting Event
TK Area: Textiles
Product: Olympic Plush Mascots
Designer: Margarete Steiff

Year 3/4

Year 3/4

Crime & Punishment
TK Area: Mechanisms
Product: Mouse Trap Board Game
Designer: Marvin Glass

Railways
TK Area: Structures
Product: Train Bridges
Engineer: Isambard Kingdom Brunel



Sporting Event
TK Area: Food Technology
Product: Energy Bars
Inventor: Alan and Juliet Barratt

Ancient Egypt
TK Area: Structures
Product: Reed Boat
Designer: Thomas Piot

Year 5/6

Year 5/6

Ancient Mayans
TK Area: Textiles
Product: Huiplin
Designer: La Malinche

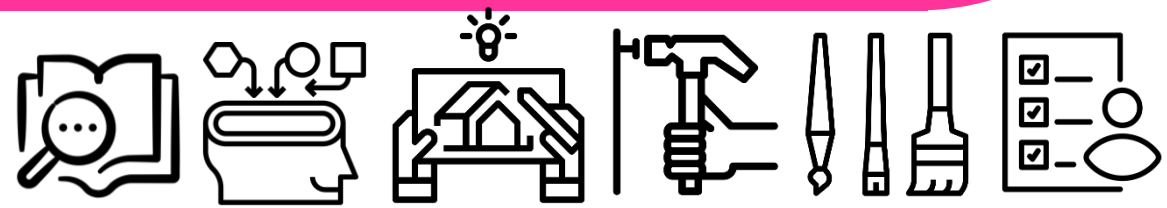
Magnificent Mountains
TK Area: Axis, Pulleys and Gears
Product: Chairlift
Designer: Jim Curran

Enough for Everyone
TK Area: Mechanisms
Product: Hydro Dam
Designer: William Armstrong

Marvellous Maps
TK Area: Electrical and Mechanical Compone
Product: Solar Powered Light
Inventor: Charles Fritts

Year 5/6

Content



Technical Knowledge

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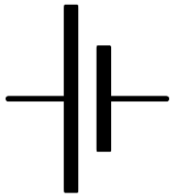
- Axles, Pulleys and Gears

- Electrical and Mechanical Components



- Food Technology

- Mechanisms

- Structures

- Textiles

Axles, Pulleys and Gears

Year 1/2

1. Deconstruct and reconstruct boxes accurately.

2. Attach wheels to a chassis using an axle, e.g. cotton reels and dowel.

3. Use pencils or tubes as rollers to move an object across the floor.

Year 3/4

1. Construct cuboids of different sizes from a net.

2. Attach a fixed axle to a chassis and add wheels ensuring that they can move freely.

3. Construct a pulley that allows a load to travel horizontally along a rope.

4. Use construction kits with gears to mesh gears at right angles.

Year 5/6

1. Design and build a working model where the direction of movement can be controlled, e.g. with a chassis with a pivoting axle.

2. Explain how the number of teeth of a gear affects the speed of rotation.

3. Explain how a belt and pulley system can be used to reverse the direction of rotation, and alter the plane of rotation by 90 degrees.

Electrical and Mechanical Components

Year 1/2

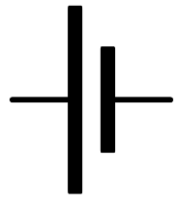
1. Use remote controlled devices, e.g. a remote controlled vehicle, Bee bot etc
2. Talk about how common electrical equipment works, e.g., kettle, telephone, and microwave.
3. Talk how equipment can be used safely.
4. Create a simple circuit using a battery, bulb and wires.

Year 3/4

1. Explore and describe how an electric motor can be used in a circuit.
2. Identify key features of electrical safety.
3. Use a remote-controlled device to switch lights on and off.(including computer control packages)

Year 5/6

1. Explore and describe how switches can be used in a range of circuits to control components, e.g. lights in a lighthouse, a movement sensor in a burglar alarm.
2. Apply appropriate safety measures when constructing circuits.
3. Explore and discuss ways in which electricity can be used to control movement.
4. Explore and use an increasing range of complex control system, e.g., a light sensor.



Food Technology

Year 1/2

1. Sort and classify food into food groups, e.g. vegetables, pulses, cereals, dairy etc.
2. Talk about what happens when food is heated and cooled Measure and weigh accurately using cups and spoons.
3. Work safely and hygienically.

Year 3/4

1. Gain an understanding of the ways in which specific food groups apply to the principles of a health and varied diet.
2. Identify what needs to be done in order to work safely and hygienically when working on a range of tasks.
3. Convert measure and weigh using standard and imperial units.
4. Give reasons for the way in which food processing can affect the taste, appearance, texture and colour of food.

Year 5/6

1. Talk about how the properties of certain foods can affect the final product.
2. Know and understand the practice needed in terms of food hygiene and kitchen safety.
3. Select the appropriate methods and equipment for measuring, e.g. time, dry goods, liquids etc.
4. Compare commercial and domestic processes for producing food, e.g. bread.

Year 1/2

1. Deconstruct a simple slider and describe how it works.
2. Construct a simple slider independently.
3. Make a lever by joining card strips with paper fasteners.

Year 3/4

1. Deconstruct and reconstruct a range of sliders and levers.
2. Vary the position of the pivot point to lift a load using a lever.
3. Construct a pneumatic with two moving parts.
4. Identify the cam within a simple mechanism and explain how movement is changed.

Year 5/6

1. Use a range of technical vocabulary to describe the properties and functions of mechanisms.
2. Choose and use a range of sliders and levers accurately to create a range of effects.
3. Analyse and evaluate the efficiency of pneumatic systems.
4. Discuss the relationship between a cam and follower, an off-centre cam, a peg cam, a pear-shaped cam and a snail cam

Mechanisms

Year 1/2

1. Construct a range of simple structures using simple construction kits.
2. Make a structure more stable by widening the base.
3. Make a square frame from strip wood using triangular card joints.
4. Make a simple card hinge.

Year 3/4

1. Deconstruct and assemble the net of a range of basic 3D shapes.
2. Join 2D frames to create 3D structures.
3. Make rectangular frames of different sizes using strip wood, reinforcing with cross braces.
4. Use a range of materials to make joints.

Year 5/6

1. Create nets and templates accurately in a range of sizes.
2. Use a range of increasing methods to strengthen 3D structures and frames.
3. Investigate measure and record the load tolerance of different structures and find ways of improving a structures load-bearing capacity.
4. Build a range of structures using a wide range of effective materials.

Structures

Textiles

Year 1/2

1. Talk about the similarities and differences between textiles based on the characteristics of an increasing range of materials.
2. Use a simple pattern with increasing accuracy.
3. Cut and join fabrics using running stitch, buttons and bond web.
4. Decorate fabric by applying beads and sequins.

Year 3/4

1. Give reasons for the selection of fabrics and techniques based on knowledge of characteristics.
2. Make and use a simple paper pattern.
3. Join fabrics in a range of different ways using zips, tie clasp, toggles, press-studs and buttons.
4. Use a wide range of simple finishing techniques.

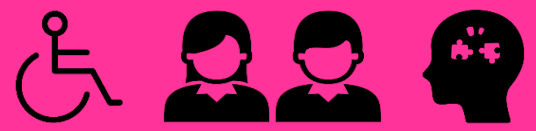
Year 5/6

1. Select appropriate materials to create a product.
2. Create increasingly complex patterns and templates with more than one part that are accurately measured.
3. Use a sewing machine to join and decorate fabric.
4. Identify the most effective finishing technique in order to maximise the aesthetic value of the product.

Our D&T Journey

Outcomes . . . We Can, We Will

All Pupils



- Long Term Retention of Knowledge
- Long Term Retention of Skills
- Social & Emotional Enrichment
- Passion and Skills for Life Long Learning
- Kind, Positive Members of Society