

**GAINSBOROUGH PRIMARY & NURSERY SCHOOL**

**SUBJECT OVERVIEW**

**Design & Technology**

Our Design and Technology curriculum follows the purpose and aims of the National Curriculum in England for Key Stages 1 and 2.

Pupils are encouraged to solve real and relevant problems through the design, making and evaluation of products.

Pupils are encouraged to draw on a range of other subjects such as mathematics, science, computing, engineering and art to help them in this area of the curriculum.

Learning about the development of past and present design technology will help our pupils understand its impact on their daily lives as well as in the wider world.

Pupils will learn about the principles of nutrition and healthy eating.

Pupils will learn to take risks and take the first steps to becoming resourceful, innovative, enterprising and capable citizens.

**INTENT (AIMS) OF THE DT CURRICULUM**

* Perform everyday tasks confidently and begin to participate successfully in an increasingly technological world through the development of creative, technical and practical expertise.
* Design and make high-quality prototypes and products for a wide range of users, using a developing bank of knowledge, understanding and skills.
* Critique, evaluate and test their ideas and products and the work of others.
* Understand and apply the principles of nutrition and learn how to cook.

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| **Early Years**  | **Year One** | **Year Two** | **Year Three** | **Year Four** | **Year Five** | **Year Six** |
| **Exploration with a wide range of materials** **Some simple drawing for design** | **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
 | **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 group
* Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design
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| **MAKE**  * Select & use a range of tools & equipment for practical tasks such as cutting, shaping, joining and finishing
 | **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
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| **EVALUATE** * Explore & evaluate a range of EXISTING products
* Evaluate their ideas and products against design criteria
 | **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
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| **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.
 | **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.
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| **COOKING & NUTRITION*** Use the basic principles of a healthy and varied diet to prepare dishes
* Understand where food comes from.
 | **COOKING & NUTRITION*** Understand and apply the principles of a healthy and varied diet
* Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques
* Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed
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|  | Structures | Mechanisms | Textiles | Electrical systems | Digital world |  Cooking and nutrition |
| **EYFS** | Junk modellingPupils use a combination of materials and joining techniques ito create a junk model. |  | Book marksPupils use threading and weaving techniques to design and sew their own bookmarks. |  |  | SoupPupils develop and make a class-based vegetable soup recipe. |
| **Year 1** |  | Moving storybookPupils to design a moving storybook with a side-to-side slider or an up-and-down slider to create movement. Pupil evaluate the main strengths and weaknesses of their design and creation. | PuppetsPupils design and create puppets by joining fabrics togetherJoin their two puppetsDecorate a puppet to match their design. |  |  | Fruit smoothiePupils to distinguish and describe fruits and vegetables. Prupils prepare fruits and vegetables to make a smoothie. |
| Year 2 | Baby bear’s chairPupils to identify a variety of structures (man-made, natural, stable, unstable) and to produce a model chair that supports a teddy, using the appropriate materials and construction techniques to make it strong, stiff and stable. | Fairground wheelPupils to design a wheel considering the materials, shape, construction and mechanisms of their wheel. Pupils to build a stable structure with a rotating wheel and then test and adapt their designs as necessary.  | PouchesPupils design, prepare and cut fabric to make a pouch from a template. Pupils to use a running stitch with regular-sized stitch to join fabric together and decorate their pouch. |  |  |  |
| **Year 3** | Constructing a castlePupils to design a castle with key features which satisfy a given purpose. Pupils to utilise skills to build a complex structure from simple geometric shapes. Evaluate their work by answering simple questions. | Pneumatic toysPupils to draw accurate diagrams (including thumbnail sketches and exploded diagrams) in line with design criteria. Pupils to assemble their pneumatic system within the housing to a finished pneumatic toy that fulfils the design brief. |  |  | * E charm pouch
* Pupils to write and explain a program that initiates a flashing LED panel when a button is pressed (e charm) and identify
* errors when testing it.
* Pupils to assemble a pouch to house the echarm ad evaluate their design.
 | Eating seasonallyPupils to understand about ‘seasonal’ fruits and vegetables and design their own tart recipe using seasonal ingredients. Pupils to follow the instructions within a recipe and understand about food hygiene and safety. |
|  | Structures | Mechanisms | Textiles | Electrical systems | * Digital world
 | Cooking and nutrition  |
| **Year 4** |  | Making a slingshot vehiclePupils to design and construct an accurate, functioning car chassis that is suitable to reduce air resistance for the project. Pupils to produce panels that will fit the chassis and construct car bodies effectively.  | FasteningsPupils to write a design criteria and design a book sleeve that fastens. Pupils to assemble their book sleeve using any stitch they are comfortable with.  | Torches | Mindful moments timersPupils to analyse existing products (timers) and write a program that displays a timer on the Micro:bit. Pupils to design and construct packaging to hold/display the timer. Pupils to evaluate the Micro:bit timer and how it might function.  |  |
| ***Year 5*** | BridgesIdentify stronger and weaker shapes. Recognise that supporting shapes can help increase the strength of a bridge, allowing it to hold more weight. Identify beam, arch and truss bridges and describe their differences. Use triangles to create simple truss bridges that support a load (weight). Cut beams to the correct size, using a cutting mat. Smooth down any rough cut edges with sandpaper. Follow each stage of the truss bridge creation as instructed by their teacher. Complete a bridge, with varying ranges of accuracy and finish, supported by the teacher. Identify some areas for improvement, reinforcing their bridges as necessary. |  | Stuffed toysPupils to design and create a template for a stuffed toy. Pupils to sew fabric together using a blanket stitch and use appliqué or decorative stitching to decorate the front of their stuffed toy.  | DoodlersExplain how circuits work and provide examples of motorised products. Remove and replace different parts of a Doodler and suggest ways to improve the Doodler and the effect it had on the Doodler’s ability to draw scribbles (function). Develop design criteria with consideration for the target user, the purpose of their Doodler, a key function and the Doodler’s form (e.g. fun, bright, soft). Create a functional Doodler that creates scribbles on paper with or without a switch. Explain simply the steps to assemble a Doodler as part of a set of instructions. |  | What could be healthier? Pupils to understand how food gets from the farm to our plates and what a ‘healthy meal’ means. Notice the nutritional differences between different products and recipes. Recognise nutritional differences between two similar recipes and give some justification as to why this is. Work as a team to amend a bolognese recipe with healthy adaptations. Follow a recipe to produce a healthy bolognese sauce. Design packaging that promotes the ingredients of the Bolognese. |
| Year 6 | Playgrounds- 4 lessonsCreate five apparatus designs, applying the design criteria to their work. Make suitable changes to their work after peer evaluation. Make roughly three different structures from their plans using the materials available. Complete their structures, improving the quality of their rough versions and applying some cladding to a few areas. Secure their apparatus to a base. Make a range of landscape features using a variety of materials which will enhance their apparatus. | Automata toys- 4 lessonsMark, saw and cut out the components and supports of their toy with a varying degree of accuracy to the intended measurements. Attempt a partial assembly of their toys using an exploded-diagram, following a teacher’s demonstration. Develop a design idea with some descriptive notes. Explore different cam profiles and choose three for their follower toppers with an explanation of their choices. Create neat, decorated follower toppers with some accuracy. Measure and cut panels that fit with some inaccuracies to conceal the inner workings of the automata. Decorate and finish the automata to meet the design criteria and brief. Evaluate their finished product, making descriptive and reflective points on function and form. |  | Steady hand game- 4 lessonsExplain simply what is meant by ‘form’ and ‘function’. State what they like or dislike about an existing children’s toy and why. Learn about skills developed through play and apply this knowledge in a survey of one or more children’s toys. Identify the components of a steady hand game. Design a steady hand game of their own according to their design criteria, using four different perspective drawings. Create a secure base for their game, with neat edges, that relates to their design. Make and test a functioning circuit and assemble it within a case. | Navigating the world- 5 lessonsIncorporate key information from a client’s design request in their design brief and write a program that displays an arrow to indicate cardinal compass directions with an ‘On start’ loading screen. Identify errors (bugs) in the code and ways to fix (debug) them. Identify key industries that use 3D CAD modelling and why. Recall and describe the name and use of key tools used in Tinkercad (CAD) software. Combine more than one object to develop a finished 3D CAD model in Tinkercad. Complete a product pitch plan. |  |