

Beckley CE Primary School - Progression of Knowledge & Skills in Design & Technology

| | EYFS | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
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| Expected Standard | | | | | | | |
| DESIGN - Developing, Planning and Communicating Ideas | <ul style="list-style-type: none"> • Work within different contexts such as story-based, home, school, playground. • Generate ideas from existing examples. • Begin to talk about their designs | <ul style="list-style-type: none"> • Work within a range of contexts e.g. story-based. • Use existing knowledge to generate their own original designs • State what products they are designing and making • Say whether their products are for themselves or other users • Explain what their products are for • Plan an outcome through pictures with labels • Model their ideas in card and paper where necessary | <ul style="list-style-type: none"> • Generate ideas by drawing on their own and other people's experiences • Work confidently within a range of contexts e.g. imaginary, local community, industry and wider environment • Generate further ideas through comparing existing products • Describe their design using pictures, diagrams and words • Identify a purpose for what they intend to design and make • Identify a target group for their product and say how the product will be useful for the user • Identify simple design criteria • Develop their design ideas through discussion, observation, drawing and modelling • Model ideas by exploring materials, components, constructions kits and by making templates and mockups. • Make simple drawings and label parts • Start to describe how a commercial product works • Make increasing use of ICT to plan ideas | <ul style="list-style-type: none"> • Generate ideas for an item, considering its purpose and the user/s • Identify a design criteria and establish a purpose/ audience for their product • Plan their design, using diagrams and labels to indicate the design features of their products • Plan the equipment/ tools needed and give reasons why • Start to order the main stages of making their product • Explore, develop and communicate design proposals by modelling ideas • Use what they know about the properties of materials to plan their ideas • Share and clarify ideas through discussion. • Model ideas using prototypes. • Use annotated diagrams and some computer- aided design packages, to develop and communicate ideas. • Generate realistic ideas, focusing on the needs of the user. • Begin to take account of the availability of resources. | <ul style="list-style-type: none"> • Generate ideas, considering the purposes for which they are designing • Collect and use information to generate ideas e.g. gather information about the needs and wants of individuals or groups. • Develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making, if the first attempts fail • Create a detailed plan considering their target audience, design criteria and intended purpose • Consider the way the product will be used when planning • Make labelled drawings from different views showing specific features, annotated sketches, some cross-sectional drawings and computer-aided design packages to develop and communicate ideas • Create a final design for their product based on initial ideas and revisions, based on existing ideas • Understand designs must meet a range of criteria • Think ahead about the order of their work • Share and clarify ideas confidently, through discussion • Model ideas using prototypes and pattern pieces | <ul style="list-style-type: none"> • Generate ideas through brainstorming and identify a purpose for their product • Where relevant, survey their target audience and use this to generate ideas • Take a user's view into account when designing • Produce a detailed step-by-step plan for their design method • Suggest some alternative designs and compare the benefits and drawbacks to inform the design process and outcome • Use sketches to show other ways of doing things – and then make choices between designs • Where necessary, make up a prototype first • Draw up a specification for their design • Make design decisions that take account of the availability of resources. • Develop a clear idea of what has to be done, planning how to use materials, equipment and processes, and suggesting alternative methods of making if the first attempts fail • Use results of investigations, information sources, including IT when developing design ideas | <ul style="list-style-type: none"> • Generate innovative ideas from prior research, using a range of information to inform their design • Use market research to inform plans • Where necessary, keep constraints in mind when selecting materials in design e.g. costs; available materials • Develop their own design criteria and use this to inform their ideas • Use their knowledge of science and art when designing • Draw scaled diagrams with increasing use of ratio • Consider the use of the product when selecting materials • Where relevant, make up a prototype or pattern piece first • Communicate their ideas through detailed labelled drawings and justify their plan to someone else • Explore, develop and communicate aspects of their design proposals by modelling their ideas in a variety of ways • Plan the order of their work, choosing appropriate materials, tools and techniques |

TECHNICAL KNOWLEDGE

- Pupils recognise that a range of technology is used in places such as homes and schools
- They select and use technology for particular purposes
- Begin to know about the simple working characteristics of materials and components
- Begin to understand the movement of simple mechanisms such as levers, sliders and wheels, or toys with buttons and mechanisms

- Select and use technology for particular purposes
- They know how to operate simple equipment and show an interest in toys with buttons, flaps and simple mechanisms and operate them successfully.
- Pupils understand the simple working characteristics of materials and components.
- Know about the movement of simple mechanisms such as levers, sliders, wheels and axles. Identify the key features of an existing product
- Know how some moving objects work

- Pupils understand the working characteristics of materials and components.
- They know about the movement of simple mechanisms such as levers, sliders, wheels and axles.
- Explain how different parts move
- Join materials together as part of a moving product
- Understand how freestanding structures can be made stronger, stiffer and more stable.
- Recognise that 3D textiles products can be assembled from two identical fabric shapes.
- Use the correct technical vocabulary for projects

- Pupils know how to use learning from science and mathematics to help design and make products that work.
- They understand that materials have functional and aesthetic qualities.
- Recognise that materials can be combined and mixed to create more useful characteristics.
- Know how mechanical systems such as levers and linkages create movement.
- Use a range of components (e.g. levers, linkages and pneumatic systems)
- Know that simple electrical circuits and components can be used to create functional products.
- Program a computer to control their products.
- Manipulate materials using a range of tools and equipment (often with support)
- Measure, cut and assemble with increasing accuracy
- Work out how to make models stronger

- Pupils use learning from science, mathematics and other subjects to help design and make products that work.
- They understand that materials have functional and aesthetic qualities and apply this thinking successfully to their own products.
- Recognise that materials can be combined and mixed to create more useful characteristics.
- Know that mechanical and electrical systems have an input, process and output.
- Know how mechanical systems such as levers and linkages create movement.
- Know that simple electrical circuits and components can be used to create functional products.
- Program a computer to control their products.
- Use a simple circuit and add components to it to create motion or make light
- Understand how some properties can be used – e.g. waterproof
- Explain why they have selected materials, tools and techniques to use
- Independently manipulate materials using a range of tools and equipment
- Measure, cut and assemble with accurately
- Use a range of components (e.g. levers, linkages and pneumatic systems)
- Understand how wheels, axles, turning mechanisms, hinges and levers all work together

- Know that mechanical and electrical systems have an input, process and output.
- Know how mechanical systems such as levers and linkages create movement.
- Know that simple electrical circuits and components can be used to create functional products.
- Apply their understanding of how to strengthen, stiffen and reinforce more complex structures
- Understand and use mechanical systems in their products [e.g. gears, pulleys, cams, levers and linkages]
- Understand and use electrical systems in their products [e.g. series circuits incorporating switches, bulbs, buzzers and motors]
- Apply their understanding of computing to program and control products.

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- Understand and use electrical systems in their products [e.g. series circuits incorporating switches, bulbs, buzzers and motors]
- Explore more complex electrical circuits and components
- Create designs including hydraulics and pneumatics when/where appropriate
- Program computers and devices to monitor changes in the environment and control their products.

MAKING (construction & textiles) - Working with tools, equipment, materials and components to make quality products

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| <ul style="list-style-type: none"> Shows some planning skills by suggesting what to do next. Begins to follow safety procedures. Selects from a range of materials and components. | <ul style="list-style-type: none"> Make their design using appropriate techniques With help measure, mark out, cut and shape a range of materials Use tools e.g. scissors and a hole punch safely Assemble, join and combine materials and components together using a variety of temporary methods e.g. glues or masking tape Make a structure/model using different materials Make simple models, not necessarily with a purpose Join textiles together Use simple finishing techniques to improve the appearance of their product | <ul style="list-style-type: none"> Begin to select tools and materials; use vocabulary to name and describe them Use their knowledge of some working characteristics of materials when designing Measure, cut and score with some accuracy Use hand tools safely and appropriately Select tools for folding, joining, rolling Assemble, join and combine materials in order to make a product Use a simple template for cutting out Cut, shape and join fabric. Use basic sewing techniques to make a product. Choose and use appropriate finishing techniques | <ul style="list-style-type: none"> Select tools and techniques for making their product Measure, mark out, cut, score and assemble components with more accuracy Measure and cut out using centimetres Prepare for work by assembling components together before joining Score and fold for precision Alter and adapt materials to make them stronger Combine a number of components together in different ways Work safely and accurately with a range of simple tools Think about their ideas as they make progress and be willing change things if this helps them improve their work Measure, tape or pin, cut and join fabric with some accuracy Use finishing techniques strengthen and improve the appearance of their product using a range of equipment including IT | <ul style="list-style-type: none"> Select appropriate tools and techniques for making their product Measure, mark out, cut and shape a range of materials accurately to build effective structures or to create a product Uses appropriate tools, equipment and techniques Experiments with a range of techniques to increase stability in a structure Considers which materials are fit for purpose and joins them appropriately Joins with a greater range of techniques – e.g. staples Strengthen joins and corners in a variety of ways Join and combine materials and components accurately in temporary and permanent ways Devise a template or pattern for their product Can increasingly model their ideas before making Measure accurately to centimetres and grams Sew using a range of different stitches, weave and knit Measure, tape or pin, cut and join fabric with some accuracy Use simple graphical communication techniques Use finishing techniques, showing an awareness of audience (e.g. sanding, varnishing, glazing) | <ul style="list-style-type: none"> Select appropriate materials, tools and techniques to ensure that the final product will appeal to the audience Measure and mark out accurately in mm and cm Use skills in using different tools and equipment safely and accurately Weigh and measure accurately (time, dry ingredients, liquids) Cut and join with accuracy to ensure a good-quality finish to the product Make stable and strong joins to stand the test of time Can they use a range of tools and equipment with good accuracy and effectiveness, within established safety parameters Can use a range of joining techniques Demonstrate that their product is strong and fit for purpose Consider the audience when choosing textiles Devise a template or pattern for their product | <ul style="list-style-type: none"> Select appropriate tools, materials, components and techniques Assemble components make working models Measure and cut out in precise detail, and make sure that finished products are carefully finished Use different kinds of circuits in their product to improve it Incorporate a switch into their product Incorporate hydraulics and pneumatics Make separate elements of a model, with improvements where necessary, before combining into the finished article Produce a simple instruction manual or handbook for their product Use a range of joining techniques Choose appropriate tools and materials to ensure that the final product will appeal to the audience Use a range of tools and equipment with good accuracy and effectiveness, within established safety parameters Consider the audience when choosing textiles Construct products using permanent joining techniques Make modifications as they go along Pin, sew and stitch materials together create a product Achieve a quality product |
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| <p style="writing-mode: vertical-rl; transform: rotate(180deg);">COOKING & NUTRITION</p> | <ul style="list-style-type: none"> Start to prepare simple dishes. Use food preparation techniques e.g. cutting and peeling. Begin to recognise that everyone should eat at least five portions of fruit and vegetables every day | <ul style="list-style-type: none"> Describe what they want to make using pictures and words Make lists of materials they will need Explain what they are making Use techniques such as cutting, peeling, grating Use basic food handling, hygienic practices and personal hygiene when preparing simple dishes Understand the principles of a healthy diet | <ul style="list-style-type: none"> Understand and use the terms ingredient and component Use simple scales or balances Know how to prepare simple dishes safely and hygienically, without using a heat source. Select and use appropriate fruit and vegetables, processes e.g. cutting, peeling, grating and tools Recognise that a healthy diet is made up of a variety and balance of different foods and drinks, as depicted on 'The Eatwell Plate.' | <ul style="list-style-type: none"> Understand and apply the principles of a healthy and varied diet Begin to select their own ingredients when cooking or baking Know how to prepare and cook a variety of predominantly savoury dishes safely and hygienically, including the use of a heat source. Know how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking. Present food in an appealing way Understand safe food storage Weigh in grams Demonstrate hygienic food preparation and storage Know that to be active and healthy, food is needed to provide energy for the body. | <ul style="list-style-type: none"> Know that food is farmed, reared, grown elsewhere (e.g. home, allotments), exported, imported or caught. This can be on a local, regional and international scale. Prepare and cook a variety of sweet and savoury dishes safely and hygienically, including the use of a heat source Use a wide range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking. Select their own suitable ingredients when cooking or baking Present food in an appealing way Understands and explain safe food storage Can evaluate food by taste, texture, flavour etc | <ul style="list-style-type: none"> Understand seasonality and know where and how a variety of ingredients are grown, reared, caught and processed Begin to know how food is processed into ingredients that can be eaten or used in cooking Know how to prepare and cook a variety of savoury and some sweet dishes safely and hygienically, including the use of a heat source. Apply the rules for basic food hygiene and other safe practices e.g. hazards relating to the use of ovens Use proportions when cooking, by doubling and halving recipes Can modify a recipe and explain why they have changed it Can meet an identified need – e.g. a meal for an older person – by selecting suitable ingredients Work in a safe and hygienic way | <ul style="list-style-type: none"> Consider culture and society in their food choices Can keep cost constraints in mind when selecting ingredients Can calculate the amount of ingredients needed use this to estimate cost Can use proportions when cooking extending beyond doubling and halving recipes Can begin to write their own recipes based on recipes they have previously tried Know that recipes can be adapted to change the taste, texture, aroma and appearance. Can make choices/changes to recipes and justify their decision Know that different foods contain substances that are needed for health e.g. water, fibre, vitamins, minerals and nutrients. Understand that healthy diets must incorporate the correct amounts of food types and substances. |
| <p style="writing-mode: vertical-rl; transform: rotate(180deg);">EVALUATING</p> | <ul style="list-style-type: none"> Begin to talk about their design ideas and what they are making. Think about how to make their products better. Begin to explore what products are, who they are for, how they are used, where they are from. | <ul style="list-style-type: none"> Use simple terms to talk about their own and others' work Can describe how their product works Can identify success, how to improve their products and next steps | <ul style="list-style-type: none"> Can talk about their design ideas and what they are making Can assess how well their product works Can use like and dislike when evaluating or describing their product Recognises what they have done well and can talk about what could be improved Can seek out the views and judgements of others Can predict how changes might improve the finished product Can use digital photography to present design or finished work | <ul style="list-style-type: none"> Thinks about their ideas as they make progress and are willing to make changes if this helps them to improve their work Can assess how well their product works in relation to the purpose Can explain how they could change their design to make it better Can alter and adapt original plans following discussion and evaluation Recognises what has gone well, but suggests further improvements for the finished article | <ul style="list-style-type: none"> Can talk about what they like and dislike about their own and existing products, giving reasons Develops their designs through their own reflection and the evaluation of others Can carry out tests before making improvements Thinks about their ideas as they progress and make changes to improve their work Can assess how well their product works in relation to the design criteria and the intended purpose Explains how they could improve their design and how their improvement would affect the original outcome | <ul style="list-style-type: none"> Checks that their design is effective and fit for purpose Can assess how well their product works in relation to the design criteria and the intended purpose and suggest improvements Evaluates appearance and function against the original design criteria Can identify what is working well and what might be improved – and make choices from several alternatives Refine the quality of the finished product, including making annotations on the design Can increasingly use testing to improve models and finished products Makes improvements from design suggestions Consider cost and sustainability | <ul style="list-style-type: none"> Confidently tests and evaluates their final product Can assess and explain whether it is fit for purpose Describes and explains what would improve it and why Can discuss whether different resources have improved their product Explain if they need more or different information to make it even better Test and evaluate commercial products, understanding how this information supports their own designs Can evaluate a range of different sources of information such as advertising and handbooks Is able to demonstrate that their product is strong and fit for purpose Recognise several inventors, designers, chefs, manufacturers and engineers, who have been influential in the design and technology industries. |

Greater Depth Standard

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| | <ul style="list-style-type: none"> Confidently explores what products are, who they are for, how they are used, where they are from Understands the simple working characteristics of materials and components and can talk about how a product works with confidence. Shows exceptional skill in developing and communicating ideas by talking and drawing. Confidently uses a range of materials, components, construction kits, textiles, food ingredients and mechanical products. | <ul style="list-style-type: none"> Shows confidence and independence when exploring what products are, what they are made from, who they are for, how they are used, where they are from Pupils show a more advanced understanding of the working characteristics of materials and components Shows exceptional skill in using knowledge of existing products to help come up with ideas, confidently communicating plans by talking and drawing. Confidently and with greater independence uses a range of materials, components, construction kits, textiles, food ingredients and mechanical products. | <ul style="list-style-type: none"> Can justify and give reasons for their products as part of their evaluation. Confidently uses and applied learning from science and mathematics to help design and make products that work. Shows exceptional skill in using annotated sketches to develop and communicate ideas. Confidently and with greater independence uses a range of materials, components, construction kits, textiles, food ingredients and mechanical products. | <ul style="list-style-type: none"> Refers to their design criteria continuously as they design and make their product and use their design criteria to evaluate their completed products. Pupils confidently use and apply learning from science, mathematics and other subjects to help design and make products that work. Shows exceptional skill in using annotated sketches and discussion to develop and communicate ideas. Confidently and independently uses a range of materials, components, construction kits, textiles, food ingredients and mechanical products. | <ul style="list-style-type: none"> Investigates and analyses more deeply: who designed the products; where products were designed and made; when products were designed and made; whether products can be recycled or reused. Explores more complex mechanical systems or electrical components. Shows exceptional skill in using annotated sketches and cross-sectional drawings to develop and communicate ideas. Confidently and independently uses a range of materials, components, construction kits, textiles, food ingredients and mechanical products. | <ul style="list-style-type: none"> Confidently consider the impact and innovative qualities of their products. Explores more complex mechanical systems, pneumatics or electrical components. Shows exceptional skill in using annotated sketches, cross-sectional drawings and computer-aided design packages, to develop and communicate ideas. Confidently, accurately and independently uses a range of materials, components, construction kits, textiles, food ingredients and mechanical products. | <ul style="list-style-type: none"> Investigate and analyse: how much products cost to make; how innovative products are; how sustainable the materials in products are; what impact products have beyond their intended purpose. Confidently and independently combines and mixes materials to create products which are finished to a high specification Incorporates more complex mechanical systems, pneumatics or electrical components into their products. Shows exceptional skill in using annotated sketches, cross-sectional drawings, exploded diagrams and computer-aided design packages, to develop and communicate ideas. Confidently, accurately and independently uses a range of materials, components, construction kits, textiles, food ingredients and mechanical products. |
| <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Examples of Deeper Thinking Questions</p> | <ul style="list-style-type: none"> | <ul style="list-style-type: none"> What would you change about your design and why? How could you make your design faster/stronger etc. What do you like about someone else's design? What would happen if you changed....? | <ul style="list-style-type: none"> What could you do to make your design better and what difference would this change make? Find one thing that is better about someone else's design. How would you help someone who wanted to make their own...? What is the best/worst thing about your design? | <ul style="list-style-type: none"> What could you change to improve your design and what impact would this change have? What made creating your design difficult? What questions would you ask if...? | <ul style="list-style-type: none"> Explain what you could change and how it would improve your design? How would you change your design for the 'real world'? How effective at.... Is your...? | <ul style="list-style-type: none"> How could you make your design more suited to mass production? What developments would need to be made for your design to....? What tests would you need to do to...? | <ul style="list-style-type: none"> What would you need to change to be able to sell your design? How could you adapt... to make...? What do you predict would happen if...? Judge whether.... would cause/change/affect.... |