DT Knowledge and Skills Progression Map 2021-2022

Early Year Foundation Stage

Ages and Stages – Reception: Expressive Arts and Design

- 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.
- Join different materials and explore different textures.

ELG Creating with Materials

Children at the expected level of development will:

-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;

-Make use of props and materials when role playing characters in narratives and stories.

National Curriculum KS1

Pupils should be taught about:

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 e.g. 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 e.g. levers, sliders, wheels and axles, in their products.

Cooking and Nutrition:

- Use the basic principles of a healthy and varied diet to prepare dishes.
- Understand where food comes from.

National Curriculum KS2

Pupils should be taught about:

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 e.g. 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 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, monitor and control their products.

Cooking and 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.

Intent

At Brindle Gregson lane Primary, our design & technology curriculum is constructed to inspire children to think innovatively, inquisitively and to become risk takers. We provide varied learning opportunities which aim to develop not only children's technical skill in design & technology; but also to develop their wider knowledge of product design and their ability to apply vocabulary accurately. We encourage 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. At Brindle Gregson Lane we encourage children to learn to think and intervene creatively to solve problems both as individuals and as members of a team which can improve analysis, problem solving, and practical capability and evaluation skills.

Implementation

DT is taught on a termly basis. In DT, we teach the National Curriculum, supported by a clear skills and knowledge progression. This ensures that skills and knowledge are built on year by year and sequenced appropriately to maximise learning for all children. All teaching of DT follows the design, make and evaluate cycle with each stage rooted in technical knowledge. The design process is rooted in real life, relevant contexts to give meaning to learning. While making, children are given choices and a range of tools to choose freely from. Children then evaluate their own products against a design criteria. Teachers make use of PlanBee Design and Technology scheme to support in the delivery of DT lessons The key skills we teach children include, sewing and textiles, cooking and nutrition, electrical and mechanical components and using materials.

Impact

Through implementation of the DT curriculum at BGL, children will:

- understand and apply subject specific vocabulary
- achieve age related expectations at the end of each academic year
- retain and build on knowledge, understanding and skills in DT
- Develop the ability to act as responsible designers and makers, working ethically, using finite materials carefully and working safely
- develop the ability to manage risks exceptionally well to manufacture products safely and hygienically
- participate in wider DT-based activities, applying the skills taught across different curriculum areas.
- develop a love for DT and an appreciation of the design process.

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DT Strands	Y1	Y2	Y3	Y4	Y5	Y6
Design	• Use pictures and words to convey what they want to design/make. • Propose more than one idea for their product. • Use kits/reclaimed materials to develop more than one idea. • Model ideas / make mock-ups with kits, reclaimed materials. • Select appropriate technique explaining: First… Next… Last…. • Explore ideas by rearranging materials/ingredients. • Select pictures to help develop ideas. • Use drawings to record ideas as they are developed. • Add notes to drawings to help explanations. • Use ICT to communicate their ideas. • Describe their models and drawings of ideas and intentions.	• Use pictures and words to convey what they want to design/make. • Propose more than one idea for their product. • Use kits/reclaimed materials to develop more than one idea. • Model ideas / make mock-ups with kits, reclaimed materials. • Select appropriate technique explaining: First… Next… Last…. • Explore ideas by rearranging materials/ingredients. • Select pictures to help develop ideas. • Use drawings to record ideas as they are developed. • Add notes to drawings to help explanations. • Use ICT to communicate their ideas. • Describe their models and drawings of ideas and intentions.	• Develop more than one design or adaptation of an initial design. • Plan a sequence of actions to make a product. • Record the plan by drawing using annotated sketches. • Begin to use cross-sectional and exploded diagrams. • Use prototypes to develop and share ideas. • Think ahead about the order of their work and decide upon tools and materials/ingredients. • Propose realistic suggestions as to how they can achieve their design ideas. • Consider aesthetic qualities of materials/ingredients chosen.	• Develop more than one design or adaptation of an initial design. • Plan a sequence of actions to make a product. • Record the plan by drawing using annotated sketches. • Begin to use cross-sectional and exploded diagrams. • Use prototypes to develop and share ideas. • Think ahead about the order of their work and decide upon tools and materials/ingredients. • Propose realistic suggestions as to how they can achieve their design ideas. • Consider aesthetic qualities of materials/ingredients chosen.	• List tools needed before starting the activity. • Plan the sequence of work e.g. using a storyboard. • Record ideas using annotated diagrams. • Use models, kits and drawings to help formulate design ideas. • Combine modelling and drawing to refine ideas. • Devise step by step plans which can be read / followed by someone else. • Use exploded diagrams and cross-sectional diagrams to communicate ideas. • Sketch and model alternative ideas. • Decide which design idea to develop.	• List tools needed before starting the activity. • Plan the sequence of work e.g. using a storyboard. • Record ideas using annotated diagrams. • Use models, kits and drawings to help formulate design ideas. • Combine modelling and drawing to refine ideas. • Devise step by step plans which can be read / followed by someone else. • Use exploded diagrams and cross-sectional diagrams to communicate ideas. • Sketch and model alternative ideas. • Decide which design idea to develop.
Make	• Discuss their work as it progresses. • Select materials/ingredients from a limited range that will meet the design criteria. • Select and name the tools needed to work the materials/ingredients. • Explain what they are making. • Explain which materials/ingredients they are using and why. • Name the tools they are using.	• Discuss their work as it progresses. • Select materials/ingredients from a limited range that will meet the design criteria. • Select and name the tools needed to work the materials/ingredients. • Explain what they are making. • Explain which materials/ingredients they are using and why. • Name the tools they are using.	• Prepare pattern pieces as templates for their design. • Cut slots. • Cut internal shapes. • Select from a range of tools for cutting shaping joining and finishing. • Use tools with accuracy. • Select from techniques for different parts of the process. • Select from materials according to their functional properties. • Plan the stages of the making process.	• Prepare pattern pieces as templates for their design. • Cut slots. • Cut internal shapes. • Select from a range of tools for cutting shaping joining and finishing. • Use tools with accuracy. • Select from techniques for different parts of the process. • Select from materials according to their functional properties. • Plan the stages of the making process.	• Make prototypes. • Develop one idea in depth. • Use researched information to inform decisions. • Produce detailed lists of ingredients / components / materials and tools. • Use a computer to model ideas. • Select from and use a wide range of tools. • Cut accurately and safely to a marked line. • Select from and use a wide range of materials.	• Make prototypes. • Develop one idea in depth. • Use researched information to inform decisions. • Produce detailed lists of ingredients / components / materials and tools. • Use a computer to model ideas. • Select from and use a wide range of tools. • Cut accurately and safely to a marked line. • Select from and use a wide range of materials.

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	• Describe what they need to do next	• Describe what they need to do next	• Use appropriate finishing techniques.	• Use appropriate finishing techniques.	• Use appropriate finishing techniques for the project. • Refine their product – review and rework/improve.	• Use appropriate finishing techniques for the project. • Refine their product – review and rework/improve.
Evaluate	• Explore existing products and investigate how they have been made. • Decide how existing products do/do not achieve their purpose. • Talk about their design as they develop and identify good and bad points. • Note changes made during the making process as annotation to plans/drawings. • Say what they like and do not like about items they have made and attempt to say why. • Discuss how closely their finished product meets their design criteria and how well it meets the needs of the user.	• Explore existing products and investigate how they have been made. • Decide how existing products do/do not achieve their purpose. • Talk about their design as they develop and identify good and bad points. • Note changes made during the making process as annotation to plans/drawings. • Say what they like and do not like about items they have made and attempt to say why. • Discuss how closely their finished product meets their design criteria and how well it meets the needs of the user.	• Investigate similar products to the one to be made to give starting points for a design. • Draw/sketch products to help analyse and understand how products are made. • Research needs of user. • Identify the strengths and weaknesses of their design ideas in relation to purpose/user. • Decide which design idea to develop. • Consider and explain how the finished product could be improved. • Discuss how well the finished product meets the design criteria of the user. • Investigate key events and individuals in Design and Technology.	• Investigate similar products to the one to be made to give starting points for a design. • Draw/sketch products to help analyse and understand how products are made. • Research needs of user. • Identify the strengths and weaknesses of their design ideas in relation to purpose/user. • Decide which design idea to develop. • Consider and explain how the finished product could be improved. • Discuss how well the finished product meets the design criteria of the user. • Investigate key events and individuals in Design and Technology.	• Research and evaluate existing products. • Consider user and purpose. • Identify the strengths and weaknesses of their design ideas. • Give a report using correct technical vocabulary. • Consider and explain how the finished product could be improved related to design criteria. • Discuss how well the finished product meets the design criteria of the user. Test on the user! • Understand how key people have influenced design.	• Research and evaluate existing products. • Consider user and purpose. • Identify the strengths and weaknesses of their design ideas. • Give a report using correct technical vocabulary. • Consider and explain how the finished product could be improved related to design criteria. • Discuss how well the finished product meets the design criteria of the user. Test on the user! • Understand how key people have influenced design.
Technical Knowledge **Food**	• Develop a food vocabulary using taste, smell, texture and feel. • Group familiar food products e.g. fruit and vegetables. • Explain where food comes from. • Cut, peel, grate and chop a range of fruit and vegetables. • Work safely and hygienically. • Understand the need for a variety of foods in a diet. • Measure and weigh food items, non-statutory	• Develop a food vocabulary using taste, smell, texture and feel. • Group familiar food products e.g. fruit and vegetables. • Explain where food comes from. • Cut, peel, grate and chop a range of ingredients. • Work safely and hygienically. • Understand the need for a variety of foods in a diet. • Measure and weigh food items, non-statutory measures e.g. spoons, cups.		• Develop sensory vocabulary/knowledge using, smell, taste, texture and feel. • Analyse the taste, texture, smell and appearance of a range of foods. • Follow instructions/recipes. • Make healthy eating choices – use the Eatwell plate. • Join and combine a range of ingredients. • Prepare and cook using a range of cooking techniques. • Explore seasonality of vegetables and fruit. • Find out which fruit and vegetables are grown in		• Prepare mostly savoury dishes using their own selection of ingredients, taking into account their nutritional properties and sensory characteristics. • Weigh and measure using scales. • Select and prepare foods for a particular purpose. • Work safely and hygienically. • Develop understanding of a healthy diet and apply in their ingredient choices. • Use a range of cooking techniques.

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		measures e.g. spoons, cups.			countries/continents studied in Geography. • Develop understanding of how meat/fish are reared/caught.		• Join and combine a widening range of ingredients. • Know where and how ingredients are grown and processed.
	Textiles		• Start to use the appropriate vocabulary to refer to fabrics and tools. • Cut out shapes which have been created by drawing round a template onto the fabric. • Join fabrics by using e.g. running stitch, glue, staples, over sewing, tape. • Decorate fabrics with attached items e.g. buttons, beads, sequins, braids, ribbons. • Colour fabrics using a range of techniques e.g. fabric paints, printing, painting.	• Develop vocabulary for tools materials and their properties. • Understand seam allowance. • Join fabrics using running stitch, over sewing, blanket stitch. • Use prototype to make pattern. • Explore strengthening and stiffening of fabrics. • Explore fastenings and recreate some. • Sew on buttons and make loops. • Use appropriate decoration techniques.	• Develop vocabulary for tools materials and their properties. • Understand seam allowance. • Join fabrics using running stitch, over sewing, blanket stitch. • Use prototype to make pattern. • Explore strengthening and stiffening of fabrics. • Explore fastenings (inventors?) and recreate some. • Sew on buttons and make loops. • Use appropriate decoration techniques.	• Use the correct vocabulary appropriate to the project. • Create 3D products using patterns pieces and seam allowance. • 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 (closer supervision). • Combine fabrics to create more useful properties. • Make quality products.	
	Structures	• Refer to materials tools and techniques using appropriate vocabulary. • Explore how to make structures stronger. • Investigate different techniques for stiffening a variety of materials. • Test different methods of enabling structures to remain stable. • Join appropriately for different materials and situations e.g. glue, tape. • Mark out materials to be cut using a template. • Use a glue gun with close supervision.		• Develop vocabulary related to the project. • Create shell or frame structures. • Strengthen frames with diagonal struts. • Make structures more stable by giving them a wide base. • Measure and mark square section, strip and dowel accurately to 1cm.	• Develop vocabulary related to the project. • Explain how the shape of a structure affects its stability. • Know that the weight of the structure needs to be evenly spread on the base to make it secure. Investigate wyas of making a structure more stable. • Select and use appropriate tools and materials.	• Use the correct terminology for tools materials and processes. • Select appropriate materials and tools to create an instrument. • Join materials using appropriate methods. • Build frameworks to support mechanisms. • Investigate and analyse a range of African instruments. • Use different methods to strengthen or reinforce their designs. • Predict and test the strength of different beam shapes using paper and card. • Explain what a truss is and how they make bridges stronger. • Can make an arch frame	

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						• Explain how suspension bridges use tension forces to work.	
	Mechanical and Electrical	• Make a sliding mechanism out of card. • Understand and use a pivot and lever mechanism using card and a split pin. • Make a wheel mechanism using card and a split pin. • Match a mechanism to the type of movement it makes.	• Use technical vocabulary when describing mechanisms, tools and materials they use. • Join appropriately for different materials and situations e.g. glue, tape. • Try out different axle fixings and their strengths and weaknesses. • Make vehicles with construction kits which contain free running wheels. • Use a range of materials to create models with wheels and axles e.g. tubes, dowel, cotton reels. • Cut dowel using hacksaw and bench hook. • Attach wheels to a chassis using an axle. • Use a hole punch and Insert paper fasteners for card.	• Develop vocabulary related to the project. • Explain how simple pneumatic systems work using appropriate vocabulary. • Recognise familiar objects that use air to make them work. • Describe how objects use air to make them work. • Create simple effective pneumatic systems. • Investigate ways of using pneumatic systems with other materials to control movement. • Recognise the uses to which alarm systems can be put. • Understand that switches work in different ways. • Understand the dangers of main electricity. • Explain how a simple circuit works. • Investigate different ways of creating switches and circuits.			• Develop a technical vocabulary appropriate to the project. • Explore how different transmissions create different movements. Use a crank to change the motion on a transmission from circular to linear. • Explain how computers and computer programs are used in different products. • Explain how modern memory chips work to store information. • Know what a computer engineer is and what they do.