Design and Technology Policy

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Rights Respecting Schools linked article:

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Grand Avenue Rationale

In line with the National Curriculum for Design and Technology (D&T), we believe that D&T is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils should design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They should acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art. Pupils should learn how to take risks and become resourceful, innovative, enterprising and capable citizens. Through the evaluation of past and present D&T, they will develop a critical understanding of its impact on daily life and the wider world. High-quality D&T education makes an essential contribution to the creativity, culture, wealth and well-being of the nation.

Aims

Following the National Curriculum for Design and Technology Grand Avenue Primary and Nursery School aims to ensure that all pupils:

- Develop the creative, technical and practical expertise needed to perform everyday tasks confidently and to participate successfully in an increasingly technological world
- Build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- Critique, evaluate and test own ideas and products and the work of others
- Understand and apply the principles of nutrition and learn how to cook.

Teaching and Learning Experiences

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

Foundation stage

Children are encouraged to build with a wide range of objects, selecting appropriate resources and adapting their work where necessary. D&T forms part of the 'Knowledge and Understanding' section of the Early Years Foundation Stage curriculum.

In Key stage 1, pupils will be taught to:

- Design
    - Design purposeful, functional, appealing products for themselves and other users based on design criteria
    - Generate, develop, model and communicate own 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 own ideas and products against design criteria
- Use and Apply 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.

In Key stage 2, pupils will 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 ideas and products against 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
- Use and Apply Technical knowledge
    - Apply 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 understanding of computing to program, monitor and control their products.

Time allocation and organisation

In Nursery there is always at least one construction or 'making' activity available for the children during each session, in line with the early learning goals for designing and making skills.

In Reception there are several opportunities each week for children to explore a variety of construction materials. Each term the children undertake a design and make task.

In Key Stages 1 and 2 children complete one unit of work per term from the 'Projects on a Page' scheme from the D&T Association. In Key Stage 1 and Key Stage 2, each project is linked where appropriate with other curriculum areas such as science, mathematics, ICT, English or history.

Planning

Planning for Continuity and Progression

The school follows the 'Projects on a Page' (POAP) scheme. The long-term plan ensures the pupils develop their knowledge, skills and understanding by building on their previous experiences through a range of investigative activities, focused on practical tasks and design and make assignments (see Appendix 1). The design of POAP allows teachers to adapt their 'final pieces' and 'key practitioners' to align with the wider curriculum being taught in each year group while still covering the core D&T curriculum.

Planning and lesson resources will reference the D&T Key Concepts (see Appendix 2) to support pupils in making connections in their learning across the school.

Medium Term Planning

Planning ideas from the relevant POAP unit is used and adapted by each year group in collaboration with the coordinator. Plans are completed on the school proforma provided.

Short Term Planning

All class teachers are responsible for weekly planning based on the agreed medium term plans. They ensure that all essential activities (as identified in each unit) and assignment stages are covered. Planning includes differentiation, key vocabulary, and opportunities to recap previous learning.

Monitoring and Evaluation

The monitoring and evaluation of D&T meets the requirements of the school monitoring policy. Monitoring and evaluation activities include:

- Referring to teachers' plans
- Sampling children's work
- Observing lessons
- Interviewing staff and children
- Analysing assessment and record keeping
- Photographing displays of designs, making processes, and final pieces.

Learning outcomes in each unit identify how children can demonstrate their knowledge, understanding and design and make skills. These are reflected in the children's recording of focused practical tasks and assignments, and in teachers' comments on children's work.

Marking and Assessment

Teachers of D&T will use the school Marking Policy and Assessment Policy. They will…

- Allow for different learning styles and ensure that pupils are given the chance and encouragement to demonstrate their competence and attainment through appropriate means
- Make sure our approach to marking and assessment is familiar to the pupils and the children have been adequately prepared for our assessment methods
- Use materials which are free from discrimination and stereotyping in any form
- Provide clear and unambiguous feedback to pupils to aid further learning.

At the end of each year, KS1 and KS2 class teachers will make a record of each child's achievement against the KPIs (see Appendix 3). Children are recorded as 'working towards ARE' or 'exceeding ARE'.

The Role of the Coordinator

The coordinator will be responsible for…

- creating an annual action plan
- using assessment data to inform the action plan
- advising and evaluating the needs of staff and assisting colleagues in planning
- undertaking an annual review of resources
- monitoring and evaluating the teaching and learning of D&T in the school
- undertaking regular pupil voice and feeding back to SLT
- attending CPD and signposting other staff to relevant CPD
- leading staff meetings
- liaising with outside advisory teams and other agencies
- ensuring staff are aware of health and safety issues
- reporting to the head teacher, staff, parents and governors.

The Role of the Governors

The governors will be responsible for…

- becoming familiar with issues surrounding this policy
- agreeing the policy, revisions and amendments
- evaluating the success of the policy through visits to the school
- raising the topic on a regular basis at Governing Body meetings
- supporting the implementation of the policy
- ensuring funding to support this policy is considered during the budget setting process
- meeting with the Design and Technology coordinator on a regular basis
- having a clear view of the strengths and areas for development
- attending relevant training

Staff Development

The staff needs are initially met by the coordinator through leading staff meetings and INSET. Needs are identified through monitoring arrangements and discussions with staff members. Courses organised by the Borough are available for teachers to attend.

Resources

Resources are ordered at the beginning of the year. Year group specific resources are kept in the relevant year group. Whole school resources are kept in the STEM room.

Resourcing needs are regularly monitored, and new/replacement resources are obtained within the curriculum budget set by governors as identified by the coordinator and staff.

Equal Opportunities/Entitlement

All children have equal access to the D&T curriculum, irrespective of race, gender, class or ability. The school ensures that:

- All children cover the content made statutory by the Programmes of Study within the National Curriculum
- Children access the curriculum at the appropriate level, thus ensuring progression and differentiation

- Suitable resources and learning environments will be available to enable children access to the learning required.

Special Educational Needs

Provision will be made and agreed with the SENCO for any child who has learning differences. This may include differentiated activities or access to appropriate construction materials.

More Able Children

More able children's needs will be addressed with differentiated activities. This may involve working on a 'design and make' assignment with more than one feature, undertaking independent research or trailing designs.

Cross Curricular Opportunities

As well as making distinctive contributions to the school curriculum, D&T contributes to the wider aims of primary education and makes significant contributions to the following cross curricular areas:

- RHE and Citizenship;
- The Development of Key Skills;
- The Development of Thinking Skills;
- Education for sustainable development;
- The Development of Enterprise and Entrepreneurial skills.

D&T continues to make an important contribution to English, mathematics, science, art and ICT as identified in each 'Projects on a Page' unit.

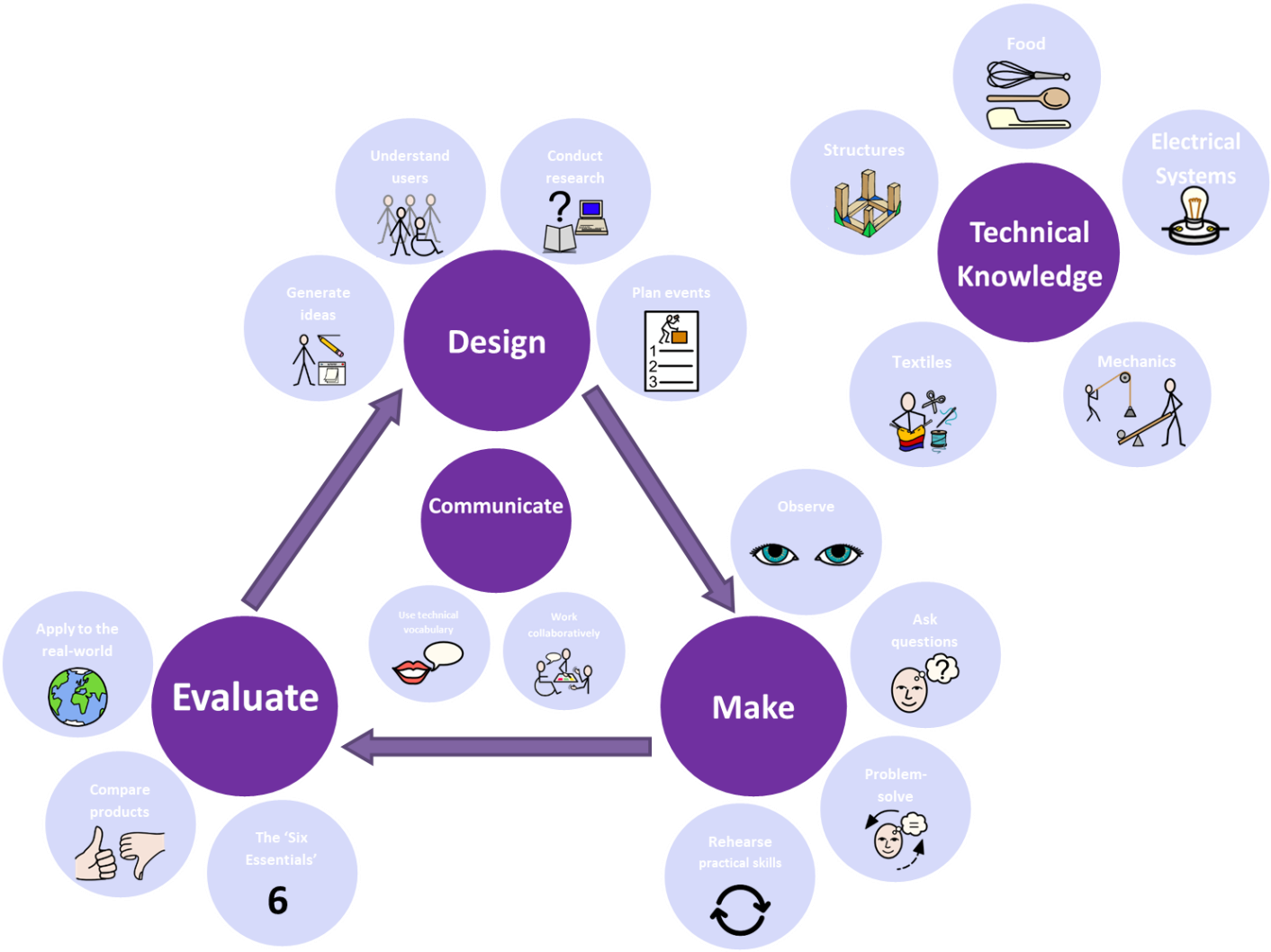
Health and Safety

The Health and Safety guidelines will be displayed in each classroom (see Appendix 4).

Appendix 1: Planning Overview for Grand Avenue.

	Autumn	Spring	Summer
Nursery	*D&T activities throughout the year – see EYFS D&T framework for details.*		
Reception	*D&T activities throughout the year – see EYFS D&T framework for details.*		
Year 1	**Mechanics**: sliders and levers	**Food**: preparing fruit and vegetables	**Structures**: freestanding structures
Year 2	**Mechanics**: wheels and axles	**Textiles**: templates and joining techniques	**Food**: preparing fruit and vegetables continued
Year 3	**Textiles**: 2D to 3D products	**Structures**: shell structures and CAD	**Food**: healthy and varied diets
Year 4	**Food**: healthy and varied diet continued	**Mechanics**: levers and linkages	**Electrical systems**: simple circuits and switches
Year 5	**Mechanics**: pulleys or gears	**Structures**: frame structures	**Food**: celebrating culture and seasonality
Year 6	**Textiles**: combining different fabric shapes	**Food**: celebrating culture and seasonality continued	**Electrical systems**: complex switches and circuits

Appendix 2: Design and Technology Key Concepts.



Appendix 3: Key Progress Indicators for each year group in line with the Programme of Study.

	Design	Make	Evaluate
1	State what products they are designing and making. Say whether their products are for themselves or other users. Generate ideas by drawing on their own experiences. Develop and communicate ideas by talking and drawing. Work confidently within a range of contexts (imaginary, story-based, home, school, gardens, playgrounds). Describe what their products are for. Use knowledge of existing products to help come up with ideas.	Plan by suggesting what to do next. Select from a range of tools and equipment, explaining their choices. Follow procedures for safety and hygiene. Measure, mark out, cut and shape materials and components. Assemble, join and combine materials and components.	Talk about their design ideas and what they are making. Make simple judgements about their products and ideas against design criteria. Suggest how their product could be improved.
2	Say how products will work. Model ideas by exploring materials, components or construction kits, or by making templates and mock-ups. Say how products will be made suitable for intended users. Use simple design criteria to develop ideas. Use information and communication technology where appropriate to develop and communicate their ideas.	Use a range of materials and components, including construction materials/kits and mechanical components. Select from a range of materials and components according to their characteristics. Use a range of materials and components, including textiles. Use finishing techniques, including those from art and design. Select from a range of materials and components according to their characteristics. Use a range of materials and components, including food ingredients.	Discuss what and who products are for, how they work and how/where they are used. Discuss what materials products are made from. Discuss what they like/dislike about the products.
3	Work confidently within a range of contexts (home, school, leisure, culture, enterprise, industry or the wider environment). Develop their own design criteria and use these to inform their idea. Describe the purpose of their products. Generate realistic ideas focusing on the needs of the user.	Measure, mark out, cut and shape materials and components with some accuracy. Apply a range of finishing techniques, including those from art and design. Use a wider range of materials and components than in KS1 (including construction materials or kits, textiles, or mechanical components). Order the main stages of making. Select tools and equipment suitable for the task.	Refer to their design criteria as they design and make. Identify the strengths and areas for development in their ideas and products. Consider who designed and made the (example) products and where/when products were designed and made.
4	Gather information about the needs and wants of particular individuals and groups. Make design decisions that take account of the availability of resources. Share and clarify ideas through discussion. Model their ideas using prototypes.	Explain their choice of tools and equipment in relation to the skills and techniques they will be using. Assemble, join and combine materials and components with some accuracy. Use a wider range of materials and components than KS1 (including electrical components).	Use their design criteria to evaluate their completed products. Think about chefs who have developed ground-breaking products. Consider whether products can be recycled or reused. Think about inventors, designers, engineers, or manufacturers who have developed ground-breaking products. Consider how well products have been designed, and made, what methods of construction were used and why materials have been chosen.
5	Identify the needs, wants, preferences and values or particular individuals and groups. Develop a simple design specification to guide their thinking. Indicate the design features of their products that will appeal to intended users. Explain how particular parts of their products work. Make design decisions, taking account of constraints such as time, resources and cost. Use annotated sketches and cross-sectional drawings to develop and communicate ideas.	Select materials and components suitable for the task. Accurately measure, mark out, cut and shape materials and components. Explain their choice of materials and components according to functional properties and aesthetic qualities. Produce appropriate lists of tools, equipment and materials that they need. Formulate step-by-step plans as a guide to making.	Evaluate their ideas and products against their original design specification. Consider how much products cost to make and how sustainable the materials in products are. Consider the views of others, including intended users, to improve their work.
6	Use computer aided design to develop and communicate their ideas. Carry out research using surveys, interviews, questionnaires and web-based research. Generate innovative ideas drawing on research. Use exploded diagrams to develop and communicate ideas.	Accurately apply a range of finishing techniques, including those from art and design. Accurately assemble, join and combine materials and components. Use techniques that involve a number of steps. Demonstrate resourcefulness when tackling practical problems.	Think about inventors, designers, engineers, chefs or manufacturers who have developed ground-breaking products. Critically evaluate the quality of the design, manufacture and fitness for the purpose of their products as they design and make. Consider how innovative products are and what impact products have beyond their intended purpose. Consider how well products work, how well they achieve their intended purpose and how well they meet user needs and wants.

Appendix 4: Health and Safety Posters to display for staff in classrooms where D&T lessons take place (including the STEM room).

Health & Safety

Whilst Health and Safety considerations & risk assessment remain the primary responsibility of the teacher in charge, the children should be taught to…

1. reduce risks through responsible behaviour and use good practice to avoid hazardous situations developing.
2. abide by simple safety rules when using tools or equipment.
3. consider and recognise hazards in their proposed ways of working and take action to minimise them.
4. assess the risk of hurt or damage posed by evaluating their own and other designer's products and suggest remedial action.
5. store tools and materials with due regard and organise their working environment/practices in a safe way.

Areas for special concern include…

- ✓ the use of hot-melt glue guns and saws and to be aware of what to do in the event of a minor injury.
- ✓ food technology lessons require that hygiene is given the utmost priority. Activities involving the use of cookers/ovens/microwaves require a high level of supervision with appropriate safety/protective clothing being available.
- ✓ fabric work that involves scissors, sharp cutting tools, pins and needles requires careful resource management. Children should be taught simple storage strategies for dealing with sharp objects that are 'not in use'.
- ✓ construction kits may pose some small risk (particularly at KS1) and children should be warned of the dangers of placing pieces in their mouths etc.
- ✓ safe practices for handling soft mouldable materials should also be taught to minimise small pieces being inappropriately used!
- ✓ contact with foodstuffs and other materials likely to cause allergic reactions should be avoided.