Aims of the Policy

At St. George's Catholic Academy, we are committed to high quality teaching and learning in Design and Technology to raise standards of achievement for all children. All staff and governors have been consulted in developing this policy, which summarises expectations and common working practices. It reflects what has been agreed in terms of approach and consistency and makes explicit the best practice in Design and Technology to which the school aspires. It also reflects the aims and objectives of the school and supports its vision.

Learning is the purpose of the whole school and is a shared commitment. At St. George's Catholic Academy, we recognise that education involves children, parents, staff, governors, the community, diocese and the local authority, and that for optimum benefit all should work closely together to support the process of learning. Working in partnership, we aim to:

- provide a Christ-centered, supportive, positive, healthy, caring and safe environment, which has high expectations and values all members of the school community;
- recognise the needs and aspirations of all individuals and provide opportunities for all pupils to make the best possible progress and attain the highest personal achievements; to enable them to 'grow in faith and have faith in growing'.
- ensure children can develop as competent individuals, within a broad, balanced, exciting and challenging Design and Technology curriculum;
- provide rich and varied contexts and experiences for pupils to acquire, develop and apply a broad range of knowledge, skills and understanding;
- provide a Design and Technology curriculum which promotes the spiritual, moral, social, cultural, physical, mental and emotional development of the pupils;
- develop individuals with lively, enquiring minds, good thinking skills, self-respect, self-discipline and positive attitudes;
- encourage all children to be enthusiastic and committed learners, promoting their self -esteem, self-worth and emotional well-being;
- develop children's confidence and capacity to learn and work independently and collaboratively.

Design and Technology Curriculum Statement of intent

The intent of the Design and Technology curriculum at St George's is for our children to learn, apply and strengthen essential skills that are required to design, make and evaluate products for a given purpose. It is also the intent to ensure that children are well-equipped with useful technical knowledge to support them in the making of their product. In addition, we aim to develop our children's use and understanding of technical vocabulary associated with this subject so that we can create a language rich curriculum.

Curriculum Intent model

1. We aim for children to have acquired the essential characteristics of designers/engineers:
2. Significant levels of originality and the willingness to take creative risks to produce innovative ideas and prototypes.
3. An excellent attitude to learning and independent working.
4. The ability to use time efficiently and work constructively and productively with others.
5. The ability to carry out thorough research, show initiative and ask questions to develop an exceptionally detailed knowledge of users' needs.
6. The ability to act as responsible designers and makers, working ethically, using finite materials carefully and working safely.
7. A thorough knowledge of which tools, equipment and materials to use to make their products.
8. The ability to apply mathematical knowledge.
9. The ability to manage risks exceptionally well to manufacture products safely and hygienically.
10. A passion for the subject and knowledge of, up-to-date technological innovations in materials, products and systems.

Implementation

1. Curriculum drivers shape our curriculum breadth in design technology. They are derived from an exploration of the backgrounds of our students, our beliefs about high quality education and our values. They are used to ensure we give our students appropriate and ambitious curriculum opportunities. **Our curriculum drivers are community, spirituality, culture, democracy and possibilities.**

2. Cultural capital gives our students the vital background knowledge required to be informed and thoughtful members of our community who understand and believe in British values.

3. Curriculum breadth is shaped by our curriculum drivers, cultural capital, subject topics and our ambition for students to study the best of what has been thought and said by many generations of academics and scholars.

4. Our curriculum distinguishes between subject topics and 'threshold concepts'. Subject topics are the specific aspects of subjects that are studied.

5. **<u>Threshold concepts</u>** tie together the subject topics into meaningful schema. The same concepts are explored in a wide breadth of topics. Through this 'forwards-and-backwards engineering' of the curriculum, students return to the same concepts over and over and gradually build understanding of them. In Design and Technology, these threshold concepts are; ***Master practical skills*** (Developing the skills needed to make high quality products); **Design, make, evaluate and improve** (thinking and seeing design as a process); **Take inspiration from design throughout history** (Appreciating the design process that has influenced the products we use in everyday life).

6. **<u>Knowledge categories:</u>** These categories help students to relate each topic to previously studied topics and to form strong, meaningful schema. In Design and Technology these knowledge categories include: Technical knowledge, Practical knowledge, Design Inspiration and Design Process

7. Cognitive science tell us that working memory is limited and that cognitive load is too high if students are rushed through content. This limits the acquisition of long-term memory. Cognitive science also tells us that in order for students to become creative thinkers, or have a greater depth of understanding they must first master the basics, which taken time.

8. **<u>Milestones:</u>** For each of the threshold concepts three Milestones, each of which includes the procedural and Knowledge categories in each subject give students a way of expressing their understanding of the threshold concepts. Milestone 1 is to taught across Years 1 and 2, milestone 2 is taught across Year 3 and 4 and milestone 3 is taught across Year 5 and Year 6

9. **<u>Cognitive Domains:</u>** Within each Milestone, students gradually progress in their procedural fluency and semantic strength through three cognitive domains: basic, advancing and deep. The goal for students is to display sustained mastery at the 'advancing' stage of understanding by the end of each milestone and for the most able to have a greater depth of understanding at the 'deep' stage.

10. **<u>Pedagogical Content Knowledge and Strategies:</u>** As part of our progression model we use a different pedagogical style in each of the cognitive domains of basic, advancing and deep. This is based on the research of Sweller, Kirschner and Rosenshine who argue to direct instruction in the early stages of learning and discovery based approaches later. We use direct instruction in the basic domain and problem based discovery in the deep domain. This is called the reversal effect.

11. Our curriculum design is based on evidence from cognitive science; three main principles underpin it:

   - Learning is most effective with spaced repetition.
   - Interleaving helps pupils to discriminate between topics and aids long-term retention.

- Retrieval of previously learned content is frequent and regular, which increases both storage and retrieval strength.
- At St George's we follow the two part retrieval process: 'Know more, Remember more' and 'Do more' to ensure that knowledge retention is secure across the curriculum

12. In addition to the three principles we also understand that learning is invisible in the short-term and that sustained mastery takes time.

13. Our content is subject specific. We make intra-curricular links to strengthen schema.

14. Continuous provision, in the form of daily routines, replaces the teaching of some aspects of the curriculum and, in other cases, provides retrieval practice for previously learned content.

Impact

The intended impact of the DT curriculum is that children:
- Are inspired by the DT curriculum and want to learn more.
- Show their progression in their skills, knowledge and understanding through the work that they produce.
- Can discuss their learning and remember what they have learnt.
- Can identify some key designers and talk about the impact that their work has had on the world.

Design and Technology - Subject Leader

The Subject leader has a variety of roles. These include:

- taking the lead in policy development and quality assuring Design and Technology knowledge organisers, resources and Design and Technology plans throughout the school;
- supporting colleagues in their development and implementation of Design and Technology knowledge organisers, resources and Design and Technology plans and in assessment and record-keeping activities;
- monitoring progress in Design and Technology and advising the Senior Leadership Team on action needed; taking responsibility for the purchase and organisation of central resources for Design and Technology;
- using release time to support colleagues;

- keeping up-to-date through research and continuing professional development.

Organisation

The learning environment in Design and Technology will be managed in such a way as to facilitate different styles of learning.

Opportunities will be made for:

- whole class teaching;
- group work, organised according to appropriate criteria (i.e. ability, mixed ability, friendship, etc);
- one to one teaching;
- conferencing;
- collaborative learning in pairs or groups;
- independent learning.

All areas of the learning environment will be planned for, including, where appropriate, the outside areas, in order to ensure opportunities for a range of practical activities.

The classroom will be organised to facilitate learning and the development of independence. For example:

- Key vocabulary display.
- Inspirational inventors – key information.
- Tools and materials.
- pupils will be involved in the maintenance and care of all equipment and resources.

The Design and Technology classroom will provide a stimulating and purposeful learning environment, including thought provoking and stimulating displays to include knowledge organisers and helpful resources that document the learning journey through Design and Technology in the class. In all classrooms children will have access to materials and resources which will allow them to deepen their understanding of many of the techniques that they have been learning.

Differentiation

So that we always have the highest possible expectations of individual learners and so they can demonstrate what they can do, understand and achieve, teachers will differentiate the curriculum according to individual needs by:

- pace;
- challenge:
- mastery:
- content;
- task;
- relevance;
- resources;
- extension;
- autonomy;
- teacher/adult support.

This organisation allows for all pupils, including those with SEND, to be able to access the Design and Technology curriculum.

Assessment, Recording and Reporting

Termly assessments are made of pupil's work in Design and Technology to establish the level of attainment and progress and to inform future planning. Formative assessment is used to guide the progress of individual pupils. It involves identifying each child's progress in areas of the Design and technology curriculum, determining what each child has learned and what therefore should be the next stage in his/her learning. Pupil voice, learning walks and work monitoring will be carried out regularly.

All results from assessments are analysed and used to inform future planning. (See Assessment, Marking and Feedback Policy)