The three types of knowledge

At Sonning CE Primary School, we focus on three different types of knowledge. Each subject will have a different ratio of distribution for these three types of knowledge, and the three types of knowledge can intersect at times.

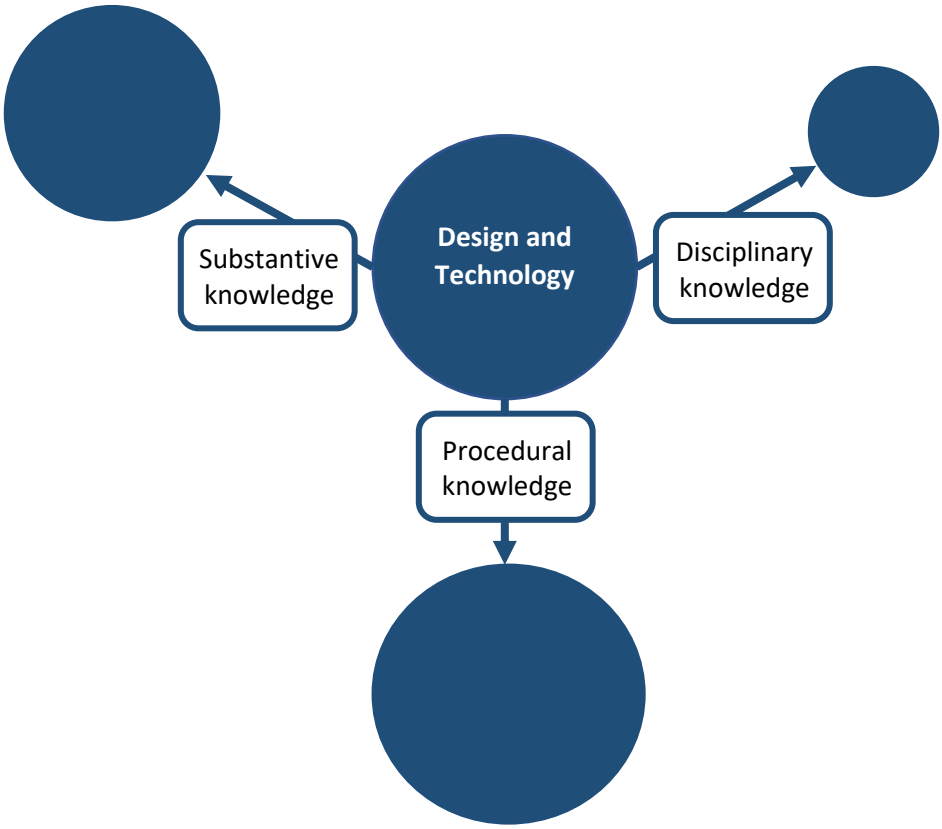
Substantive knowledge refers to the body of facts, principles, laws, descriptions, concepts etc. of a subject. In other words, this could be referred to as the facts and main knowledge that pupils might learn (e.g. how a pulley works or how an electrical circuit can light up a bulb).

Disciplinary knowledge refers to the methods that establish substantive knowledge (i.e. how engineers or designers test out, refine and develop successful and functional products, including debugging faults or issues). An understanding of the disciplines (methods of establishing facts) that shape a subject can help provide a lens or rationale for the way the subject is delivered. A pupil's capacity to learn and use disciplinary knowledge is highly dependent on the depth and security of their substantive knowledge, so there is often a focus on substantive knowledge first. As well as considering how a fact was established, disciplinary knowledge also includes considering its degree of certainty and how it continues to be revised.

Procedural knowledge refers to the skills or techniques needed to complete a procedure or task. It is the 'know how' of the processes required in a subject (e.g. the actual skill of being able to thread a needle and sew using a cross-stitch). Procedural knowledge is often incremental and requires regular practise.

Knowledge distribution

We recognise that different subjects have different weightings of substantive, disciplinary and procedural knowledge. The infographic below highlights what we consider to be the ratio for each form of knowledge within this subject:



Our vision

Design and Technology at Sonning Church of England Primary School provides pupils with the opportunity to participate in a range of different activities where they develop a variety of practical skills. Our vision for Design and Technology is for pupils to develop the theory and practical skills necessary to build strong foundations for success in the future as critical thinkers, developers, designers and makers. By learning core skills in researching others' work, designing their own products, learning the skills to create these products and evaluating the success of their work, pupils will embed core skills that will help them not just in Design and Technology, but across their academic and working lives and will enable them to contribute positively and effectively to society. At all stages, there is an emphasis on linking Design and Technology with other subjects, where possible and appropriate. Design and Technology is taught as a discrete subject.

Early Years Foundation Stage (Acorn class)

In Early Years Foundation Stage (EYFS), our Reception pupils learn about how to formulate an idea to create something, and are supported (whilst still promoting independence) to plan out and execute their idea. Using powerful questioning, pupils are developed through refining and evaluating their creation. Pupils are given the opportunity to develop their core skills with a range of Design and Technology tools, including scissors and cutlery. Pupils will be provided opportunities to build structures, test out their ideas and consider their effectiveness.

Key Stage 1 (Beech and Chestnut classes)

In Key Stage 1 (KS1), pupils are taught about the successful designers of the past, and can draw on these ideas to create their own products. Pupils will go through the whole plan, do and review process of researching and planning out an idea, learning the skills to use and putting those skills into action in making a product, then reviewing this product at the end (including receiving feedback on their product and giving feedback to others). Pupils have the opportunity to sew in small groups to begin developing these discipline-specific skills. There is also a focus on cooking at nutrition, with yearly cooking units for pupils.

Key Stage 2 (Fir, Holly, Maple and Oak classes)

In Key Stage 2 (KS2), pupils build on the skills they have developed in KS1 to enable them to be more detailed, accurate and competent in every part of the plan, do and review process. Pupils will design increasingly complex and challenging products, including using cams, pulleys and electrical circuits. There will be units on structures and sewing as well. Cooking and nutrition continues to be a focus for all classes, culminating is an independent cookery units in Year 5 and 6.

Building strong foundations through experiences

To complement the curriculum, there are visiting workshops, themed class events and educational visits, which enhance pupils' understanding and provide varied learning experiences.

Our values within the curriculum

Our values, and how they may link with a subject, can be located in each subject's Unit Maps.

Curriculum coverage

To ensure the National Curriculum is covered effectively, there is an edited version of the National Curriculum which has notes to highlight where in our Unit Maps a statement or section is covered. This document can be located here.

Curriculum structure

Design and Technology lessons are taught using blocking, with blocks taught during one half term of a full term. This ensures that three topics are taught in each year group covering a range of knowledge and skills. We will encourage

children to use the evaluation process as a time of reflection considering both the positive and negative elements of their project and using this to improve their future projects. Children will complete a Cooking and Nutrition topic in each year group to build up practical skills which will take them into adulthood.

Our Unit Maps, which can be located here, provide the overview for each subject's unit of lessons for a topic. This includes the following:

Knowledge taught / prior knowledge
Knowing what core substantive knowledge to teach, as well as prior learning which we can build on, is essential to ensuring clear progression and depth of understanding in a subject.

Milestones and assessment opportunities
Our milestone objectives and assessment opportunities ensure that there is clear progression and we know how to assess those types of knowledge and outcomes within a unit. Where possible, completed projects are shown (or photos of the finished product). The pupils will have opportunities to discuss and develop the skills being taught. Photos of work completed will be stuck in DT books to support pupils with the evaluation stage.

Concepts
Each subject has concepts which run through every unit and year group. These concepts allow consistency of focus and progression within each concept from unit to unit and year to year. In Design and Technology, our concepts are as follows:

Appraisal and Knowledge of Others' Work	**Developing Ideas and Planning**
Making and Producing	**Evaluating**

Vocabulary
As part of our focus on oracy, we have developed a list of Tier 2 and Tier 3 vocabulary to cover within a unit. This vocabulary also links into our knowledge organisers, so that the pupils have access to this essential vocabulary.

Cross curricular links
It is important to understand how subjects can work with each other, so there are specific links to other subjects outlined in the Unit Maps.

Links with our values, spirituality and organisations
Our school values are part of everything we do. To ensure that is seen within the curriculum, we make explicit links to our values, as well as British Values, spirituality and OECD and UN objectives.

Impact
We measure the effectiveness of our curriculum in the following ways:
- Pupil data tracking (PITA grids and Target Tracker)
- Book scrutiny (including photographic or video evidence)
- Monitoring of lessons and planning (including from governors and external validation e.g. TKAT or WBC)
- Pupil conferencing.

Supplementary support
We utilise the following support within our Design Technology curriculum:
- Design and Technology Association subscription (https://www.designtechnology.org.uk/)
- TKAT subject network meetings

- Local STEM projects, such as 3M, or local school partners such as Reading Blue Coat School and other local secondary schools.

Overview of the units covered

	Across the academic year		
Reception (Acorn)	Regular opportunities (inside and outside) for construction, as well as evaluating structures made or the effectiveness of materials used. Pupils will get to use, with adult support, tools such as scissors, paintbrushes, cutlery, screwdrivers and hand drills. Real life equipment such as wooden blocks and drainpipes are available for pupils to use for construction. Pupils are encouraged to give each other feedback on what they have made, using our school values and showing respect and aspiration.		
	Autumn Term	**Spring Term**	**Summer Term**
Year 1 (Beech)	**Structures** Making strong structures – creating wooden photo frames	**Cooking and nutrition** Understanding where food comes from (Fruit salad)	**Structures** Design and construction – kites
Year 2 (Chestnut)	*A focus on Art in Term 1, as there are already strong cross curricular links for DT in Term 2 (including English, History and Geography).*	**Cooking and nutrition** Indian Cooking **Structures** Making a Tudor house	**Textiles** Sewing – using a running stitch
Year 3 (Fir)	**Mechanisms** Pneumatics	**Structures** Building bridges that can bear weight	**Cooking and nutrition** Bread
Year 4 (Holly)	**Electrical systems and Structures** Light up Christmas decorations.	**Electrical systems** Apply their understanding of computing to program, monitor and control products.	**Cooking and nutrition** Greek Food
Year 5 (Maple)	**Mechanisms** Pulleys (rotating planets)	**Cooking and nutrition** Creating and making a healthy and balance meal	**Textiles** Sewing a tablet case
Year 6 (Oak)	**Textiles** 'Make Do and Mend' (sustainable clothing)	**Cooking and nutrition** Healthy soup	**Electrical systems** Super Suckers (vacuums)