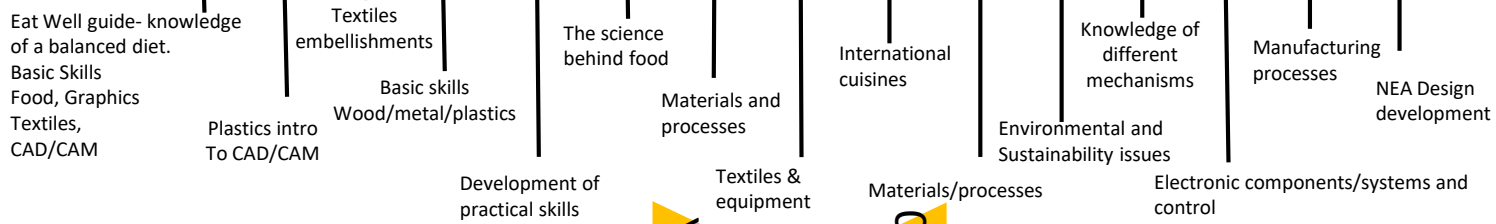# Design and Technology Knowledge Map

Our curriculum has a strong emphasis on the cumulative acquisition and contextualisation of knowledge in the specialisms of design, technology, food and textiles.

Light Hall School
The best from everyone, all of the time.

The Big Knowledge Picture

Year 7 → Year 11

- Eat Well guide- knowledge of a balanced diet. Basic Skills Food, Graphics Textiles, CAD/CAM
- Plastics intro To CAD/CAM
- Textiles embellishments
- Basic skills Wood/metal/plastics
- Development of practical skills
- The science behind food
- Materials and processes
- Textiles & equipment
- International cuisines
- Materials/processes
- Environmental and Sustainability issues
- Knowledge of different mechanisms
- Electronic components/systems and control
- Manufacturing processes
- NEA Design development

The KS3 Big Questions

Year 7 → Year 9

- Where do materials originate from?
- How are the materials and products made?
- How do you cook healthy and balanced meals?
- How can you prepare a variety of ingredients?

The KS4 Big Questions

Year 10 → Year 11

- Why are environmental and ecological issues and sustainable design important?
- What is the life cycle analysis of a product ?
- What significance do designer and design movements have on the future of design?
- What is the design process?

Paper and Card – Modelling, testing materials and finishes

- What are the categorisation and properties of paper, cards, boards and composite materials.
- What does the target group think of the design proposals?
- Can the design be modelled in 3D to check it will function?

Onshape

YEAR 11

- Students use a variety of materials, tools and equipment to manufacture a working prototype
- Test and evaluate how the product functions and suggest improvements
- Understand the topics for the core knowledge requirements for section A
- Decide on the material area to learn for the more in depth knowledge the topics for the e requirements for section B

Final design Prototyping and manufacture
- How will the final design be made?
- How will parts of the design be joined together?

Evaluation and Testing
- What do the target group think of the design?
- How can the design be improved?

Recap on theory and examination preparation
- What are the areas of the specification that require revisiting?
- What revision strategies need developing to support revision ?

GCSE Exam and Post 16 Destination

- Students independently illustrate their design proposals using a variety of graphic media
- Personalised project design tasks
- Students investigate the context of their choice to identify a problem, customer, design brief and write their specification.
- How heat treatments can alter metal properties
- Describe methods of joining metal
- How electronic systems provide functionality to products
- How the use of programmable components to embed functionality into products in order to enhance and customise their operation
- Understand how to calculate velocity ratios and mechanical advantage
- Describe the functions of mechanical devices, to produce different sorts of movement
- Analyse the function of mechanical products

NEA – Design development
- How will the design function?
- How can the solution be developed?

NEA - Introduction
- What is the problem?
- What is the solution?

Metal – Candle Holder
- What are the different heat processes?
- How are metals joined together?

Electronics and System & Control
- How are circuits made and programmed?
- What are the electronic components purpose?
- What types of mechanisms can be used?

Mechanisms
- How do the studied mechanisms work?

YEAR 10 KEY STAGE 4

- Describe the LCA of a metal product
- Understand the different tools, processes and techniques needed
- Understand the different finishing processes
- Describe the LCA of a plastic product ng processes
- Describe the categorisation and physical properties polymers
- Explain the use and purpose of technical polymers used
- Describe the LCA of a wood product , inc, paper and board
- What are the Categorisation and properties of manufactured timbers

Metals categories – Bottle Opener CAD/CAM, Sustainability
- How is metal manufactured?
- What are the processes used in manufacture of metals?
- What are the environmental issues when using metal ?

Plastics – Categories – Practical skills and environmental issues
- How are plastic products made?
- What are the environmental issues when using plastic ?
- What are the environmental issues when using plastic?

Woods/Timber Sustainability – Practical skills
- What wood tools and equipment are used to manufacture a wooden product
- What wood joints can be used to join wood permanently ?

- How can CAD be used to develop the mould design in order to develop a 3 part mould ?
- Development if CAD/CAM skills to design a mould
- Describe the epoxy resin casting process
- Understand benefits of Alloys, Pewter Casting process.
- Produce samples of knitted Textiles.
- Producing a printed Textile design.
- Identify the use of man made fibres, combining fibres and their purpose.
- How a time plan is constructed and how health and safety points are essential for safe cooking.
- Study of famous cuisines from the U.K and internationally.
- Study of how an excess/ deficiency of nutrients cans cause diseases such as Rickets and Type 2 Diabetes.

D&T Product Design- Metal : Pewter Casting Epoxy Resin, CAD/CAM
- What tools, materials and equipment is required to cast pewter and epoxy resin?
- What tools, materials and equipment is required to cast pewter and epoxy resin?

Textiles
- How is knitted fabric constructed?
- How can I design and create a repeat print?
- Why do we need man made fibres? Where do textile fibres come from? How do we group these?

Food Technology
- How can an effective time plan ensure safety in practical lessons?
- How and why are cuisines different all over the world?
- How does an unbalanced diet lead to different diseases?

YEAR 9

- Study of macro and micro-nutrients and how they are essential in the body.
- Food science investigation into gelatinisation and gluten formation.
- Study of life stages and energy requirements of different groups.
- Evaluate Textile design movements.
- How can fabric be embellished?
- Finishing processes used for different materials .
- How can fabric be embellished?
- Understand the types of tools and equipment needed to cut and shape materials ?
- How to illustrate their design in 3D

Food Technology

Textiles

D&T Product Design- Phone Holder: Wood, Metal, Plastic
- What tools can be used to cut and shape wood, metal and plastic?
- How can CAD be used to personalise the design?

YEAR 8

- How to draw in 3D accurately?
- How is paper and card manufactured?
- What is Isometric drawing?

D&T Paper & Card
- Understanding the isometric design process
- How paper and card is made
- How to construct a NET into 3D
- What are the functions of essential nutrients that our body needs?
- What is the food science behind sauce and bread making?
- How do nutritional needs change for different groups?
- How is fabric constructed?
- How do I use Textile equipment?
- How have design styles altered in different movements?
- What are the main categories of wood, metal and plastic?

D&T Graphic Design
- How can you add colour, tone and texture to improve presentations?
- Branding Basic skills Rendering,, Perspective, Crating
- Use different embroidery stitches.
- Create embellished Textile samples.
- Evaluate design ideas and the work of others.
- Development of CAD skills
- Understanding how plastic products are made
- Understanding the laser cutting process
- Practical lessons using knife skills, kettle safety and hob skills.
- How the Eat-well Guide helps to inform healthy choices.
- Allergies, intolerances, safe food storage and hazards in the food room.

Textiles

D&T Product Design- Novelty Ruler CAD/CAM - Plastics

Food Technology

YEAR 7 KEY STAGE 3

- How can you illustrate your design in 3D accurately?
- Why is branding important?
- How can fabric be embellished?
- What inspires different Textile designers?
- How can we develop examples of embroidery?
- How to design to scale
- Where does plastic come from?
- What is CAD/CAM What are the benefits and limitations?
- What basic skills are needed to cook dishes such as stir fry?
- How can individuals follow a healthy balanced diet?
- How can we stay safe whilst cooking?

COLOR WHEEL
DEPTH

Excellence • High expectations and aspirations • Love of Learning • Active participation • Sound moral compass