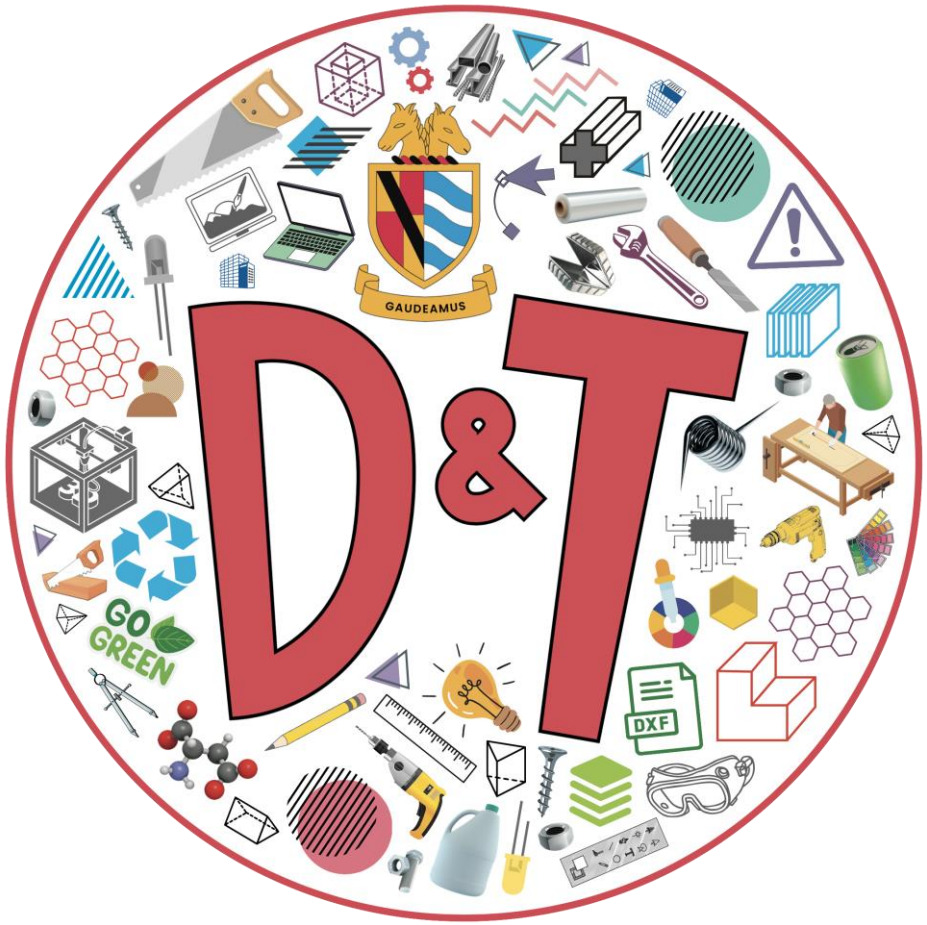

Y9

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Year 9

Topics

	Element	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6
Term 1	**Theory**	H&S	Materials- Metals	Tools	Tools	Materials- polymers	Knowledge assessment
	Practical	Garden Trowel	Garden Trowel	Garden Trowel	Garden Trowel	Garden Trowel	Garden Trowel
	Home learning (booklet provided)	Key terms	Properties			Revision	
Term 2	**Theory**	Materials- composite materials	Materials- paper and board	Isomtetric/orphographic drawing	Rendering	Workshop focus	Evaluation of product
	Practical	Garden Trowel	Garden Trowel	Garden Trowel	Garden Trowel	Garden Trowel	Garden Trowel
	Home learning	Composites	Paper and board				
Term 3	**Theory**	Advantages/Disadvangtages of CAD	Advantages of modelling	Wood joints	Wood joints	Knowledge assessment- EOY exam	Wood joints
	Practical	CAD project	CAD project	CAD project	Wood joints	Wood joints	Wood joints
	Home learning	Designers			Wood joints		

Year 9 D&T

What are you going to learn and do this year?

Current

HEAD - *Knowledge*

ear 9 Design and Technology Curriculum

Get ready to push your design boundaries and delve deeper into the world of materials and processes in Year 9 Design and Technology! Here's what you can expect:

1. Showcase Your Skills:

- **Main Projects:** You'll tackle two major projects this year:
  - **Metal Garden Trowel:** Forge a functional and stylish metal trowel for gardening enthusiasts. You'll explore advanced metalworking techniques and develop your understanding of metal properties.
  - **Wood Joints Mastery:** Become a woodworking expert! Learn about a variety of complex wood joints and apply them to create a sturdy and aesthetically pleasing project.

2. Safety Always Comes First:

- **Health and Safety:** As you work with more sophisticated tools and materials, safety becomes even more crucial. You'll refine your safe working practices and learn how to handle potential hazards in the workshop.

3. Exploring the World of Metals:

- **Materials - Metals:** Expand your knowledge of metals! This in-depth exploration covers different metal types, their unique properties, and advanced techniques for shaping, joining, and finishing them.

4. Mastering Your Toolbox:

- **Tools:** Learn how to utilize a wider range of advanced tools effectively and safely. You'll gain confidence operating new equipment and understand their appropriate applications.

5. A World Beyond Wood:

- **Materials - Polymers:** Delve into the world of polymers! Discover the properties and uses of various plastic materials and explore techniques for working with them safely and effectively in your designs.
- **Materials - Composite Materials:** Explore the fascinating world of composite materials like fiberglass and carbon fiber. Learn how different materials are combined to create unique properties for specific design applications.
- **Materials - Paper and Board:** Rediscover the potential of paper and board! Explore advanced techniques to transform these everyday materials into innovative and functional designs.

6. Visualizing Your Creations:

- **Isometric/Orthographic Drawing:** Master the art of technical drawing! Learn to create precise isometric and orthographic drawings that accurately represent your designs for clear communication and manufacturing purposes.
- **Rendering:** Bring your designs to life! Explore rendering techniques that add depth, texture, and realism to your drawings, allowing you to effectively communicate your design intent.

7. Technology in Design:

- **Advantages/Disadvantages of CAD:** Explore the power and limitations of Computer Aided Design (CAD) software. Learn how CAD can enhance your design process while understanding its potential drawbacks.

8. The Power of Modelling:

- **Advantages of Modelling:** Discover the benefits of creating physical models. Learn how models can help you visualize, test, and refine your designs before committing to final production.

9. The Art of Joining Wood:

- **Wood Joints:** Deepen your understanding of complex wood joints. Learn advanced techniques for creating strong and aesthetically pleasing joints that elevate your woodworking projects.

This year promises to be a challenging and rewarding experience! You'll refine your practical skills, master new materials and processes, and develop a deeper understanding of design communication and technology's role in the design world.

HEART - *Personal Development*

This D&T curriculum fosters personal development in several ways:

Confidence and Self-Belief: Successfully completing projects and mastering new skills builds confidence and a sense of accomplishment.

Resilience and Problem-Solving: Overcoming challenges during the design process and troubleshooting technical issues develops resilience and problem-solving skills.

Year 9 D&T

What are you going to learn and do this year?

Current

HEART - *Personal Development (continued)*

Independence and Initiative: Students learn to take ownership of their projects, manage their time effectively, and work independently.
Teamwork and Collaboration: Working with others on projects encourages teamwork, communication, and the ability to collaborate effectively.
Critical Thinking and Creativity: The design process fosters critical thinking as students analyze problems, develop solutions, and evaluate their work.
By nurturing these skills, D&T helps students build a strong foundation for personal growth and success not just in school, but also in their future endeavors.

HAND - *Skills*

Year 9 Design and Technology will equip you with a vast array of skills to become a more confident and well-rounded designer and maker. Here's a breakdown of the key skills you'll develop:
Practical Skills:
Metalworking: Through the metal trowel project, you'll refine your metalworking skills, learning advanced shaping, joining, and finishing techniques.
Woodworking: The wood joints project will hone your woodworking skills, as you master complex joint creation for strong and aesthetically pleasing results.
Safe Working Practices: You'll further develop safe working practices in the workshop, learning to handle advanced tools and materials responsibly.
Tool Mastery: You'll gain confidence and expertise in using a wider range of advanced tools, understanding their capabilities and safe operation.
Design Skills:
Technical Drawing: You'll master technical drawing by creating precise isometric and orthographic drawings to communicate your designs effectively.
Rendering: Develop your rendering skills to bring your designs to life, allowing you to visually communicate your ideas with depth and realism.
Material Selection: By exploring various materials like polymers, composites, paper, and board, you'll gain a strong understanding of material properties and how to select the right material for diverse design applications.
Technological Skills:
CAD Awareness: You'll learn about the advantages and limitations of CAD software, understanding its potential to enhance your design process.
Critical Thinking Skills:
Problem-Solving: Both projects will challenge you to solve problems creatively. You'll need to consider material properties, functionality, and user needs to find effective design solutions.
Decision-Making: Throughout the year, you'll be faced with material selection, design choices, and construction techniques. You'll learn to analyze factors and make informed decisions that contribute to successful project outcomes.
Communication Skills:
Technical Communication: Mastering technical drawing and rendering will equip you to clearly communicate your design ideas through drawings and visuals.
By the end of Year 9, you'll be a more skilled designer and maker, confident in your ability to work with a wider range of materials and tools. You'll possess a deeper understanding of design communication and be well-equipped to tackle even more challenging design projects in the future!

H&S

Y9/T1/W1

At Malbank we will develop Technologists who are creative, skilful and confident practically, socially and intellectually giving students the opportunity to impress leaders of industry so that they can make a smooth transition from education into the workplace.

Prior Knowledge

Pupils should have:

- A good understanding of H&S in a school workshop
- Experience of demonstrating H&S practices

Current

HEAD - *Knowledge*

- General Health & Safety in workshop
- Tidy workshop
- Damage to and broken tools
- PPE
- Safety Signage and their meanings
- Risk Assessments for:
- Strip Heater
- Cutting Knives (including Safety Rules and Cutting Mats)

HEART - *Personal Development*

H&S

Skill: Safety Awareness and Responsibility: You will develop a strong understanding of safety procedures and learn to take responsibility for your own and others' well-being in a workshop environment.

HAND - *Skills*

- Completing Risk Assessment on different machinery
- Identifying Safety Symbols and explain what they mean

Future

Pupils should go on to:

- Demonstrate H&S in year 9 when manufacturing the harden trowel

Materials- metals

Y9/T1/W2

At Malbank we will develop Technologists who are creative, skilful and confident practically, socially and intellectually giving students the opportunity to impress leaders of industry so that they can make a smooth transition from education into the workplace.

Prior Knowledge

Pupils should have:

- An understanding of the classifications of metals and some of their main properties

Current

HEAD - *Knowledge*

- Metals (including composition, properties, Melting Points and Applications):
- Ferrous; Mild Steel; Stainless Steel and Cast Iron
- Non-ferrous; Aluminium, Copper
- Alloys; Brass
- Properties; Hardness, Malleability, Ductility

HEART - *Personal Development*

Materials- Metals

Skill: Problem-Solving and Critical Thinking: You will learn to analyze different metals, their properties, and applications, developing critical thinking skills to select the appropriate metal for specific tasks.

HAND - *Skills*

- I can explain the difference between ferrous and non ferrous metals
- I can give some examples of each material classification and list a few uses of each
- I can explain what an alloy is
- I can explain why certain metals are used for certain products

Future

Pupils should go on to:

- I can use and handle a collection of metals including ferrous non-ferrous and alloys, giving examples and properties of each

•I can conduct magnetic testing for identification and weight testing for density.

Garden Trowel Project

Y9/T1

At Malbank we will develop Technologists who are creative, skilful and confident practically, socially and intellectually giving students the opportunity to impress leaders of industry so that they can make a smooth transition from education into the workplace.

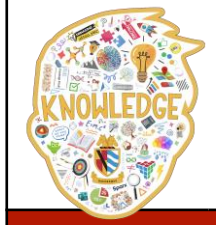
Prior Knowledge

Pupils should have:

- Some practical skills using specialist tools and machinery

Current

HEAD - *Knowledge*



- Health & Safety
- Use of templates for batch production
- Joining techniques
- Finishing techniques
- Specific tools for specific tasks
- Drilling (inc. parts of machine)
- Direction of wood grain

HEART - *Personal Development*

Tools

Skill: Manual Dexterity and Precision: Through hands-on experience with various tools, you will develop fine motor skills and learn to use tools accurately and safely.

HAND - *Skills*

- develop design specifications that include a wider range of requirements such as environmental, aesthetic, cost, maintenance, quality and safety
- use a wider, more complex range of materials, components and ingredients, taking into account their properties
- use a broad range of manufacturing techniques including handcraft skills and machinery to manufacture products precisely
- Marking out metals, Cutting and shaping metals, Drilling, Metal forming, Metals joining techniques – riveting, Metals finishing techniques – plastic coating, Joining dissimilar materials, Marking out wood, Wood shaping, Wood finishing

Future

Pupils should go on to:

- Use specialist tools to machine metal

Materials- Polymers

Y9/T1/W5

At Malbank we will develop Technologists who are creative, skilful and confident practically, socially and intellectually giving students the opportunity to impress leaders of industry so that they can make a smooth transition from education into the workplace.

Prior Knowledge

Pupils should have:

- Understanding of the classifications of polymers and some properties

Current

HEAD - *Knowledge*

- Polymer (including Forms, Properties, Advantages and Disadvantages and applications):
- Thermoplastics; Acrylic, HIPs, BioPol
- Thermosetting; Polystyrene Resin (including GRP), Urea Formaldehyde
- Properties; Insulator of Heat and Electricity, Toughness

HEART - *Personal Development*

Materials- Polymers
Skill: Innovation and Creativity: You will explore the versatility of polymers and learn to think creatively about their potential applications, fostering innovation and problem-solving abilities.

HAND - *Skills*

- Justifying choice of materials
- Explain how plastics could bean alternative material for a garden trowel
- Discuss the advantage and disadvantages of this material choice

Future

Pupils should go on to:

- Testing different polymers in a workshop at GCSE

Materials- composite materials

Y9/T2/W1

At Malbank we will develop Technologists who are creative, skilful and confident practically, socially and intellectually giving students the opportunity to impress leaders of industry so that they can make a smooth transition from education into the workplace.

Prior Knowledge	Current	Future
Pupils should have: - Have some knowledge of carbon fibre	**HEAD -** *Knowledge*  - Composite Materials (including Description, Advantages and Disadvantages, Examples); Concrete, Plywood, Fibre/Carbon/Glass, Reinforced Polymers, Robotic Materials **HEART -** *Personal Development*  **Materials- Composite Materials** **Skill: Teamwork and Collaboration:** You will learn to work effectively with others to achieve common goals. **HAND -** *Skills*  - I can list a couple of composite materials and explain where and why they are used. - I can explain the advantages of carbon fibre in sporting equipment	**Pupils should go on to:** - Analyse different composite materials and explain in detail their properties and uses

Materials- paper and board

Y9/T2/W2

At Malbank we will develop Technologists who are creative, skilful and confident practically, socially and intellectually giving students the opportunity to impress leaders of industry so that they can make a smooth transition from education into the workplace.

Prior Knowledge	Current	Future
Pupils should have: - Text	**HEAD -** *Knowledge*  - To understand some different types of paper and boards - To understand the uses of some paper and boards **HEART -** *Personal Development*  **Materials- Paper and Board** **Skill: Sustainability and Environmental Awareness:** You will gain knowledge about the environmental impact of paper and board products and learn to make informed choices about material usage. **HAND -** *Skills*  - Paper & Boards (including Weight, Description, Advantages, Disadvantages and applications): - Papers; Tracing, Copier and Cartridge - Boards; Folding Box Board, Corrugated Board, Solid White Board - Properties – Flexibility, Printability, Biodegradability	**Pupils should go on to:** - Text

Isomtetric/orphographic drawing

Y9/T2/W2, 3

At Malbank we will develop Technologists who are creative, skilful and confident practically, socially and intellectually giving students the opportunity to impress leaders of industry so that they can make a smooth transition from education into the workplace.

Prior Knowledge

Pupils should have:

- Some knowledge of 2 and 3d drawing techniques
- Experience drawing in isometric

Current

HEAD - *Knowledge*

- 3rd Angle Orthographic Drawing
- Use of drawing board and equipment
- Key terms- Orthographic, Front, Plan, End view, Set square, Drawing Board, Slide rule, Scale, Parallel, Construction lines, Gusset plates

HEART - *Personal Development*

Isometric/Orthographic Drawing
Skill: Spatial Reasoning and Visual Literacy: By learning to interpret and create isometric and orthographic drawings, you will develop your spatial reasoning skills and ability to visualize objects in three dimensions.

-

HAND - *Skills*

- I can identify orthographic, 1 and 2 point perspective and isometric drawings
- I can demonstrate the drawing techniques named above to some accuracy using a range of equipment

Future

Pupils should go on to:

- Demonstrate isometric and orthographic drawing techniques when designing products

Rendering

Y9/T2/W4

At Malbank we will develop Technologists who are creative, skilful and confident practically, socially and intellectually giving students the opportunity to impress leaders of industry so that they can make a smooth transition from education into the workplace.

Prior Knowledge

Pupils should have:

- Experience shading shapes and some drawings

Current

HEAD - *Knowledge*

- To understand the term rendering and how it benefits a sketch

HEART - *Personal Development*

Rendering

Skill: Presentation and Communication: Rendering techniques help you to present your designs in a visually appealing way. This skill develops your communication and presentation abilities.

-

HAND - *Skills*

- I can demonstrate rendering, shading and adding texture to a number of products

Future

Pupils should go on to:

- Adding texture to make any drawing look more realistic

Evaluating

Y9/T2/W4

At Malbank we will develop Technologists who are creative, skilful and confident practically, socially and intellectually giving students the opportunity to impress leaders of industry so that they can make a smooth transition from education into the workplace.

Prior Knowledge

Pupils should have:

- evaluate their products against their original specification and identify ways of improving them
- actively involve others in the testing of their products

Current

HEAD - *Knowledge*

- Understand a number of different evaluation techniques to fully evaluate a project

HEART - *Personal Development*

HAND - *Skills*

- - To write a detailed evaluation for a project that they have completed

Future

Pupils should go on to:

- To write a detailed evaluation for a project that they have completed

CAD

Y9/T3/W1

At Malbank we will develop Technologists who are creative, skilful and confident practically, socially and intellectually giving students the opportunity to impress leaders of industry so that they can make a smooth transition from education into the workplace.

Prior Knowledge

Pupils should have:

- understand what CAD stands for and be able to briefly explain why CAD is used

Current

HEAD - *Knowledge*

- The contemporary and potential future use of:
- • automation
- • computer aided design (CAD)

HEART - *Personal Development*

Advantages/Disadvantages of CAD
Skill: Technological Literacy and Critical Evaluation: You will develop an understanding of computer-aided design (CAD) software and its advantages and limitations. This will help you evaluate technology and make informed decisions about its use.

HAND - *Skills*

- use 3D CAD to model, develop and present ideas
- Render their work using CAD

Future

Pupils should go on to:

- create CAD drawings of products that they have designed themselves

Modelling

Y9/T3/W3

At Malbank we will develop Technologists who are creative, skilful and confident practically, socially and intellectually giving students the opportunity to impress leaders of industry so that they can make a smooth transition from education into the workplace.

Prior Knowledge	Current	Future
Pupils should have: - Text	**HEAD -** *Knowledge*  - Understand how you can use different materials to model with and the advantages of this during the design process **HEART -** *Personal Development*  **Advantages of Modeling** **Skill: Problem-Solving and Experimentation:** Modeling allows you to experiment with different designs and materials before committing to a final product. This skill encourages problem-solving and a willingness to take risks. **HAND -** *Skills*  - I can list a number of modelling techniques and explain a few advantages.	**Pupils should go on to:** - Text

Wood Joints

Y9/T3

At Malbank we will develop Technologists who are creative, skilful and confident practically, socially and intellectually giving students the opportunity to impress leaders of industry so that they can make a smooth transition from education into the workplace.

Prior Knowledge

Pupils should have:

- Marking out materials
- Use of Try Square
- Sawing
- Measuring
- Health & Safety

Current

HEAD - *Knowledge*

- Strengthen understanding of wood joints and the reasons as to why some of preferred than others

HEART - *Personal Development*

Wood Joints

Skill: Attention to Detail and Precision: Creating strong and accurate wood joints requires a high level of attention to detail and precision. You will develop these skills through hands-on practice.

HAND - *Skills*

- Marking out wood. Cutting wood joints
- •Revisit—Butt Joints, progress to butt-rub joint, know that butt-rub is stronger and why, then progress to finger joints, mitre joints, dowel joints

Future

Pupils should go on to:

- Use these skills to manufacture a product at GCSE