Walthamstow Academy – Design and Technology Curriculum Journey

Half Term	D&T Curriculum Content	Assessment(s) *(assessment title, duration and approx date)*	Extra-Curricular Options *(Places to visit; wider reading; clubs to join)*

Year 7 Curriculum Overview:

In Year 7, students embark on a foundational journey through design and technology that introduces them to essential workshop practices, material knowledge, and the design process. They begin by learning how to work safely in a workshop environment, using hand tools confidently to shape and manipulate acrylic. Through practical tasks, students explore the properties and categorisation of materials, with a particular focus on plastics. They then apply their learning by designing and making a small, ergonomic tool that is both functional and user-centred. Sustainability is embedded through an investigation into the origins of plastics and their environmental impact, prompting students to make informed material choices. Later in the year, students address real-world challenges by designing reading aids for younger users, incorporating CAD and CAM to bring their ideas to life. The curriculum culminates in STEAM-based projects that encourage creativity, problem-solving, and technical development across disciplines.

Design and Technology intent:

- Develop students' curiosity, creativity, and confidence in designing and making.
- Equip students with essential practical skills, including safe use of tools and workshop practices.
- Introduce key technical vocabulary and foundational knowledge of materials, particularly plastics.
- Promote responsible design thinking with a focus on sustainability and informed material choices.
- Provide opportunities for students to solve real-world problems through user-centred design projects.
- Build digital literacy through the integration of CAD (Computer-Aided Design) and CAM (Computer-Aided Manufacturing).
- Foster innovation and critical thinking through collaborative and STEAM-based learning.
- Lay the groundwork for future learning by embedding design principles, environmental awareness, and cross-curricular links**.**

IMPLEMENTATION

Year 7 HT1	**Week 1: Workshop Safety Introduction (AO1)** Students learn how to work safely in the D&T workshop, including expectations and hazard awareness. **Week 2: Tools & Materials (AO1)** Students are introduced to hand tools and practise using them to shape acrylic safely and accurately. **Week 3: Thermoplastics vs Thermosets (AO1**) Students learn key vocabulary and compare material properties of thermoplastics and thermosets. **Week 4: Categorising Materials (AO1)** – Students explore material properties (strength, flexibility, durability) and practise categorising common D&T materials.	**Homework quizzes**	Further reading: • **"Plastic: Past, Present, and Future"** by Eun-ju Kim *A fun, illustrated book exploring how plastic is made, used, and what we can do to reduce its harm.* • **BBC Bitesize: KS3 Design & Technology**: **Materials and Their Properties** *Great revision-style material for classroom support.* • **"What a Waste" by Jess French** *A brilliant and visually engaging introduction to plastic waste and sustainability for KS3.*
Year 7 HT2	**Week 5: Introduction to Design Brief (AO1)** Students respond to a brief to design a small, useful ergonomic tool for a specific user. **Week 6: Design Development (AO2)** Students sketch and refine their tool design, considering ergonomics and material properties. **Week 7: Making a Prototype (AO2)** Students begin making their tool using hand tools and workshop equipment.	**Homework quizzes**	

Year 7 HT3	**Week 8: (PPE1) Finishing & Evaluation (AO3/AO4)** Students complete and evaluate their small tool, reflecting on function and user experience. **Week 9: Sustainability & Plastics (AO1)** Students investigate the environmental impact of plastic use and explore ways to reduce waste.	**PPE1** **Students are assessed on their project: A small useful tool** **AO3 and Ao4**	Places to visit: • **Science Museum (South Kensington)** Relevant Galleries: ○ ***Materials Gallery*** – Learn about the properties of plastics and other materials. ○ ***Tomorrow's World*** – Explore innovations in sustainable design and recycling. *Hands-on exhibits that show how science solves real-world problems, including plastic waste and material engineering.*
Year 7 HT4	**Week 10: Introduction to <u>Reading Aid Project</u> (AO1) –** Students identify barriers to reading and explore how design can support younger or vulnerable readers. **Week 11: User-Centred Design (AO1)** Students develop initial concepts for a reading aid that supports sensory engagement or focus. **Week 12: Sketching & Development (AO2)** Students sketch ideas in 3D and annotate features that address user needs. **Week 13: CAD Design Skills (AO2)** Students use basic CAD software to refine their reading aid design digitally.	**Homework quizzes**	
Year 7 HT5	**Week 14: CAM & Prototyping (AO2)** Students use CAM tools such as the laser cutter to produce a functional prototype of their design. **Week 15: Assembly & Finishing (AO2)** Students assemble and finish their prototype using workshop tools and equipment. **Week 16: Testing & Peer Feedback (AO3)** Students test their prototypes, gather peer feedback, and consider improvements. **Week 17: Final Evaluation & Reflection (AO4)** Students evaluate the success of their product against the brief and reflect on the design process.	**Homework quizzes** **Videos, literacy and multiple choice questions**	
Year 7 HT6	**STEAM Mini Project 1: Plastic or Problem? Microplastics Investigation** **Focus:** Science + Design + Sustainability **Links to SOW:** Week 3–4 (Material categorisation, plastic use) **Overview:** Students investigate how microplastics enter the environment and their impact on marine life. **STEAM Mini Project 2: Ergonomics Challenge – The Paperclip Test** **Focus**: Maths + Design + Human Factors **Links to SOW**: Week 5–6 (Ergonomic tool design) **Overview**: Students explore ergonomics through rapid prototyping by redesigning a basic object for comfort and efficiency. **STEAM Mini Project 3: Digital vs Hand Tools: The Laser Cutter Debate** **Focus**: Technology + Design + Critical Thinking **Links to SOW**: Week 13–14 (CAD/CAM and prototyping)	**PPE2** **Students previous project is assessed: AO2, final prototype and a grade is given**	

	Overview: Students explore the differences between hand tools and digital fabrication in terms of time, precision, and sustainability.		

Term	Curriculum Content	Assessment(s) *(assessment title, duration and approx date)*	Extra-Curricular Options *(Places to visit; wider reading; clubs to join)*

Year 8 Curriculum Overview:
Students explore the world of textiles through the design and construction of a personalised, sustainable tote bag. They will learn key practical skills including hand stitching, use of the sewing machine, and fabric manipulation. Students investigate the properties of textile materials such as flexibility, strength, and water resistance and compare them to those used in other areas of Design and Technology like plastics and wood. Through experimentation and analysis, students apply this knowledge to make informed design decisions.

As part of a broader conversation around sustainability, students consider the environmental impact of single-use plastic bags and the benefits of reusing materials. They will explore surface decoration techniques such as repeat pattern and personalisation, with opportunities to reuse old clothes and textile scraps. The project concludes with an enterprise unit, where students learn about batch production, costing, and marketing strategies for a small product business, culminating in a presentation of their product pitch to a panel. This project not only develops practical and creative skills but also encourages students to think critically about material choices, sustainability, and the wider role of design in everyday life.

D&T intent

- Introduce students to textiles as a material area within Design and Technology.
- Develop knowledge of textile material properties (e.g. strength, flexibility, water resistance) and compare them to other materials such as wood and plastic.
- Teach essential practical skills including hand stitching, using a sewing machine, and safe use of textile tools.
- Encourage creativity through pattern design, personalisation, and surface decoration techniques.
- Promote sustainable thinking by exploring textile reuse, upcycling old clothes, and reducing single-use plastic.
- Strengthen students' ability to investigate, experiment, record ideas, and evaluate outcomes.
- Build awareness of how design can solve real-world problems, such as environmental impact and consumer behaviour.
- Introduce basic enterprise skills by exploring how to batch produce and sell a product, including cost calculation and product pitching.
- Support cross-curricular links with Maths (measuring, costing, scaling) and Art (repeat pattern and colour theory).
- Develop students' confidence, independence, and pride in creating a functional and purposeful product.

Implementation

Year 8 HT1	**Focus: Sustainability, material properties, decorative techniques, and practical textile construction** **Final Outcome: A personalised textile tote bag** **Week 1: Introduction & Purpose (AO1)** Students explore the environmental impact of plastic bags and how textile alternatives support sustainability.	**Homework Quizzes**	Further reading: ***Textiles Technology: Student Book* (KS3) – Alex McArthur & Tristram Shepard** Aligned with D&T learning objectives, it includes textile properties,

And **Year 8 HT2**	**Week 2: Investigating Textiles (AO1)** Students investigate the properties of textile materials including strength, flexibility, durability, and water resistance. **Week 3: Material Testing (AO1)** Students conduct simple tests on textile samples and record findings to inform fabric choice. **Week 4: Sustainability & Reuse (AO1)** Students explore how old clothes or scrap fabric can be reused to reduce waste and create unique products. **Week 6: Introduction to Decorative Techniques (AO2)** Students explore decorative options including block printing, applique, and embroidery. **Week 7: Designing a Repeated Pattern (AO2)** Students design a repeated motif for decoration and test printing or stitching techniques. **Week 8: Sewing Skills Introduction (AO2)** Students learn and practise key hand stitches such as running stitch, backstitch, and overcast stitch		sustainability, and manufacturing processes. ***Young Designers: Fashion & Textiles* – Harriet Brundle** Aimed at KS3–4 students, this introduces textile design, trends, and the fashion industry in a student-friendly way. ***Make Your Own Clothes* – DK Publishing** Clear step-by-step guides on sewing, understanding patterns, and using fabric—great for practical inspiration.
Year 8 HT3 &4	**Week 9: Machine Sewing Skills (AO2)** Students learn to use a sewing machine safely and practise sewing straight seams and corners. **Week 10: Pattern Drafting & Planning (AO2)** Students measure and draw their bag templates, planning assembly and decoration placement. **Week 11: Cutting and Preparing Materials (AO2)** Students cut fabric pieces and begin preparing decorative features. **Week 12: Constructing the Tote Bag (AO2)** Students begin constructing their tote bag using sewing machines and apply chosen decoration.	**PPE1** **Students are assessed on their project:** **AO2- sewing machine skills**	Online articles: **BBC Bitesize – Textiles** **Easy to read and KS3-appropriate—** covers textiles materials, techniques, and sustainability in fashion. **<u>Fashion Revolution – Who Made My Clothes?</u>** A movement encouraging ethical textile production. Great for introducing the idea of responsible manufacturing.
Year 8 HT5&6	**Week 13: Finishing & Personalisation (AO2)** Students complete the construction and add personal decorative touches such as initials or motifs. **Week 14: Testing & User Feedback (AO3)** Students test the function of their bag and gather feedback from peers to evaluate success. **Week 15: Final Evaluation & Presentation (AO4)** Students evaluate their final product, reflecting on material choices, skills used, and improvements for the future. **Week 16: Batch Production & Costings (AO1 / AO2)** Students explore the concept of batch production, calculate material costs and profit margins, and plan how their tote bag could be produced and sold as part of a small business. **Week 17: Pitch & Presentation (AO4)** Students create and deliver a pitch presentation to a panel (e.g. teacher, technician, peers) outlining their tote bag product, target audience, pricing strategy, and marketing ideas.	**PPE2** **Students are assessed on their project work:** **AO4- Final Evaluation and Presentation**	<u>Places to visit:</u> **V&A Museum (Victoria & Albert Museum – South Kensington)** The V&A houses one of the largest textile and fashion collections in the world, showcasing historical and contemporary garments, textile techniques, and decorative patterns. **Curriculum links**: Pattern, hand-stitching, textile design, sustainability in fashion. **Fashion and Textile Museum (Bermondsey)**

			Why go: A contemporary space with changing exhibitions focused solely on fashion and textile design, often with a focus on cultural influence, printing, and sustainability.

Term	Curriculum Content	Assessment(s) *(assessment title, duration and approx date)*	Extra-Curricular Options *(Places to visit; wider reading; clubs to join)*

Year 9 Curriculum Overview:

In this year long project, students will explore the global impact of climate change, focusing on rising sea levels and coastal flooding. In collaborative groups, they will investigate the concept of floating towns and cities as a sustainable response. The project culminates in a 3D model of a floating town, designed to meet real-world challenges, incorporating knowledge of materials, buoyancy, and design principles.

D&T intent

- Deepen students' understanding of the global impact of climate change, particularly rising sea levels and coastal flooding.
- Encourage empathy and awareness of how climate-related challenges affect communities worldwide.
- Introduce the concept of floating architecture as a sustainable solution for future living.
- Develop students' understanding of material science, including buoyancy, density, and material properties.
- Build confidence in visual communication through 3D sketching techniques.
- Promote collaborative working, project planning, and team-based problem solving.
- Encourage critical thinking and iterative design through prototyping, testing, and evaluation.
- Provide hands-on opportunities to design and construct scaled 3D models of floating towns.
- Integrate STEAM principles by combining science, engineering, and design within a real-world context.
- Support students in presenting and reflecting on their work, building communication and evaluative skills.

IMPLEMENTATION

Year 9 HT1	**How will climate change affect homes and towns in the future?** • Students are introduced to climate change and its impacts on coastal regions. • Students research climate-related flooding and global responses. They explore real examples of floating architecture (e.g., Netherlands, Maldives). • Students explore buoyancy principles, water resistant materials and test out their ideas • Students investigate town planning: transport, housing, community spaces.	**Homework quizzes**	Books: • **"How Big is Big? How Far is Far?" by Julia Stilitz** *Great for understanding scale and engineering concepts.* • **"Architecture for Teens: A Beginner's Book for Aspiring Architects" by Danielle Willkens** *Accessible insights into architecture and sustainable design.* <u>Places to visit:</u> **The Science Museum (South Kensington)** • *Galleries to Visit*:
Year 9 HT2	**How can sketched ideas be communicated in 3D?** • Students learn how to sketch in isometric and 2-point perspective • Students draw key buildings and structures in 3D • Students collaborate to plan a layout for a town	**Homework quizzes**	
Year 9 HT3 **And**	**How do structures float?** • PPE1 • Students create small scale structures / models of buildings • Students evaluate their design ideas and are introduced to scale • Students draw their final plan for their buildings	**Written Assessment**	

Year 9 HT4	• Students are taught modelling techniques		○ **"Our Future Planet"** Tackles climate change and carbon capture solutions. ○ **"Engineer Your Future"** Explores engineering innovation and design challenges. ○ **"Materials Gallery"** Hands-on exhibits on materials and properties. *A great way to link material science, climate solutions, and innovation.*
Year 9 HT5 and HT6	**How to build a prototype of a building.** • Students work in their groups to build 3D models of their floating towns, an emphasis on teamwork construction techniques and model finish • Students bring all model elements together and make their towns • Students work in groups to create a presentation that documents their project and explains their ideas to their peers • PPE2	**Documentation of project**	
Term	**Curriculum Content**	**Assessment(s)** ***(assessment title, duration and approx date)***	**Extra-Curricular Options** ***(Places to visit; wider reading; clubs to join)***
Implementation			
Year 10 HT1	**GCSE: AQA Art & Design – 3D Design** **<u>Focus: Collaborative set and prop design for Winter/Christmas Production</u>** **Week 1: Project Launch (AO1)** Students are introduced to the brief, explore the script and key themes, and begin noting initial ideas in their sketchbooks. **Week 2: Contextual Research (AO1)** Students investigate the time period, setting, and style of the production, and research professional set designers to inform their own ideas. **Week 3: Mood boards & Visual Inspiration (AO1 & AO3)** Students create annotated mood boards and sketches to visually explore key elements like colour, lighting, and textures. **Week 4: Site Study & Scale (AO3)** Students create a scaled floorplan or 3D sketch using correct dimensions of the performance space after observing and measuring the stage. **Week 5: Group Design Charrette (AO1 & AO3)** Students collaborate in design teams to develop shared ideas and assign roles for set, props, and backdrop elements. **Week 6: Maquette Making (AO2)**	**Assessment on all objectives from AQA: portfolios marked in their entirety.** **Students will get a mid-way mark after HT1 based on work completed until that point.**	**TBC with the theme of the production** • **"Model Making for the Stage" by Keith Orton** *Focuses on making detailed scale models for theatre productions, great for developing maquette skills.* • **"SketchUp for Set Design" by Robert Klingelhoefer** *A useful tool-based guide for students exploring CAD in set and spatial design.*

	Students begin constructing a scaled model (maquette) of their set using card and mixed media to experiment with form and layout. **Week 7: Prop and Visual Development (AO2)** Students refine their prop designs and explore materials and textures while coordinating with the art department on backdrops. **Week 8: Midpoint Critique & Feedback (AO2 & AO3)** Students present their progress to peers and staff, record feedback, and reflect on ways to improve their designs. **Week 9: Refine Final Set Design (AO2 & AO3)** Students adapt their designs in response to critique and finalise their prop and set plans with annotated drawings and updates to their maquettes. **Week 10: Construction Begins (AO4)** Students begin full-scale construction of their set and props, documenting the making process with photographs and notes. **Week 11: Construction & Collaboration (AO4)** Students continue building in teams, solving problems as they arise and checking in with Drama and Art staff for alignment with the production. **Week 12: Backdrops, Paintwork & Finishing (AO4)** Students complete visual finishing such as painting and backdrop work, ensuring quality and cohesion across all elements. **Week 13: Dress Rehearsal & Install (AO4)** Students install their completed work and assess the functionality and aesthetic impact of their designs during a live rehearsal**.** **Week 14: Project Evaluation (AO4)** Students evaluate the final outcomes of their work, reflecting on strengths, challenges, and areas for future improvement. **Week 15: Portfolio Completion & Presentation (AO1–AO4)** Students finalise their sketchbooks or digital portfolios, ensuring all assessment objectives are met and presented clearly for submission.		
Year 10 HT3&4	**Y10 3D Design Project – Sensory Toy Design (11 Weeks)** <u>Project Focus: Designing a safe, engaging sensory toy for children with autism</u> Materials & Equipment: Laser cutter, acrylic, wood, basic workshop tools **Week 1: Project Launch & Empathy Research (AO1)** Students are introduced to the brief, explore how autistic children may experience the world differently, and begin research into sensory needs and design considerations. **Week 2&3: User Needs & Designer Research (AO1 & AO3)**	**Assessment on all objectives from AQA: portfolios marked in their entirety.** **Students will get a mid-way mark after HT3 based on work completed until that point**	**Further reading:** **"The Reason I Jump" by Naoki Higashida** *A firsthand account written by a 13-year-old non-verbal autistic boy that helps students empathise with sensory overload and communication barriers.*

	Students research existing sensory toys, inclusive play, and relevant designers, while recording observations and creating annotated moodboards in their sketchbooks. **Week 4: Initial Ideas & User Scenarios (AO3)** Students sketch a range of initial concepts based on specific sensory needs (e.g. sound, texture, movement) and develop simple user scenarios to test appropriateness. **Week 5&6: Materials Exploration & Testing (AO2)** Students experiment with wood, acrylic, and soft materials to test textures, laser cutting, bending acrylic, and safe joinery for toy-making. **Week 7&8: Mechanisms & Interactivity (AO2)** Students investigate simple mechanical features (e.g. spinning, sliding, flipping) and explore how interactivity can support sensory engagement. **Week 8: Feedback & Iteration (AO1 & AO2)** Students share designs for peer and/or teacher feedback and refine their idea through sketches and updated prototypes, documenting changes in their sketchbook. **Week 9&10: Portfolio Completion (AO1–AO4)** Students complete and refine their portfolios/sketchbooks, ensuring all assessment objectives are evidenced clearly with written and visual documentation.		**"Can You See Me?" by Libby Scott & Rebecca Westcott *(fiction, KS3/4)*** *A novel co-written by a young autistic girl, exploring what it feels like to navigate school and friendships while being neurodivergent.* **National Autistic Society: 'What is Autism?' https://www.autism.org.uk/advice-and-guidance** *Clear definitions and case studies to help students understand autism and sensory differences.* **The Young V&A (Bethnal Green) The Play Gallery** • *Features toys and games from across cultures and eras, allowing students to analyse how design has evolved for different users and needs.* • *Look for sensory or multi-sensory elements: textures, movement, sound, interaction.*
Year 10 HT5	**GCSE: AQA Art & Design – 3D Design (13 weeks)** **Project Focus: Spatial design around real-world briefs – students choose one:** **1. Temporary shelter for a refugee** **2. Affordable home (e.g. tiny house)** **3. Pavilion/play structure for a primary school** **Final Outcome: Series of models and a design portfolio** **Week 1: Project Launch & Choice (AO1)** Students are introduced to the 3 brief options, consider ethical, social, and environmental factors, and choose their project direction. **Week 2: Contextual & User Research (AO1)** Students research user needs and real-world conditions (e.g. displacement, housing crises, child development) to build empathy and define a problem. **Week 3&4: Designer & Architect Research (AO1 & AO3)** Students study and record information on 4 relevant designers/architects (e.g. Shigeru Ban, Alejandro Aravena, Thomas Heatherwick, Assemble Studio) to influence their thinking. **Week 5: Initial Ideas & Sketching (AO3)**	**Assessment on all objectives from AQA: portfolios marked in their entirety.** **Students will get a mid-way mark after HT5 based on work completed until that point**	**Further reading:** **"Architecture for Humanity: Design Like You Give a Damn" – Architecture for Humanity** *A brilliant collection of real-world design solutions for global crises, from shelters to schools.* **"Shelter: How We Live" – Lloyd Kahn** *Inspiring visual book of self-built shelters, tiny homes, and adaptable spaces from around the world.* **UNHCR Shelter Design Manual (student-friendly summary online)**

	Students generate a wide range of ideas using 2D and 3D drawing techniques, considering space, function, and user experience. **Week 6: First Model – Materials & Form (AO2)** Students make their first exploratory model focusing on structure, space, or materiality, using card and foam **Week 7: Second Model - User Function (AO2)** Students make a second model focusing on how the user interacts with the space (e.g. scale, openings, zoning, light). **Week 8: Third Model - Site & Surrounding (AO2)** Students model their design in relation to its site or location, considering topography, weather, access, or landscape. **Week 9: Fourth Model – Aesthetic Finish (AO2)** Students create a refined model showcasing finish, textures, and a well-resolved design identity, drawing from designer inspiration. **Week 10: Presentation Sheets (AO3 & AO4)** Students ensure their work is presented and the assessment objectives evidenced on digital slides: concept development, designer links, models, annotated sketches. **Week 11: Evaluation & Reflection (AO4)** Students evaluate their project against the brief, assess which ideas worked best, and reflect on how their design serves the user. **Week 12: Portfolio Completion (AO1–AO4)** Students ensure all assessment objectives are met in their sketchbooks or digital portfolio, reviewing teacher feedback and self-assessing progress. **(2 weeks are left free for PPE2 and DIRT)**		**https://www.unhcr.org –** *Useful for understanding the constraints and conditions of refugee shelters.* **"The Playground Project" – *Gabriela Burkhalter*** *A visual archive of playground structures from around the world – colourful, creative, and often user-built.* **"Design for Children" – *Kimberlie Birks*** *Explores how designers have responded to the needs of children – from toys to architecture.* **Visit:** **Design Museum (Kensington)** • *Exhibitions on architecture, social design, and sustainable building.* • *Visit: https://designmuseum.org* **RIBA Architecture Gallery (Portland Place)** • *Free exhibitions, models, and archive drawings from UK architects – often focused on housing or social spaces.*
Term	**Curriculum Content**	**Assessment(s)** ***(assessment title, duration and approx date)***	**Extra-Curricular Options** ***(Places to visit; wider reading; clubs to join)***
Year 11 HT1&2	**Year 11 (Autumn Term): Component 1 – Non-Exam Assessment (NEA)** In the first half of Year 11, students continue working on Component 1, which contributes 60% of their final GCSE grade. Building on their project work from Year 10, students select one of the three design briefs (Set Design, Sensory Toy, or Places & Spaces) to develop further into a final working prototype. Using feedback from earlier assessment points, students refine and improve their sketchbooks and portfolios to strengthen evidence across all four assessment objectives. This stage culminates in the creation of a **final prototype**, demonstrating students' ability to develop a sustained and personal design response.	**Portfolio is assessed and the marks are recorded as PPE1- students are given an opportunity to improve their grades by PPE2**	
HT3&4	**Year 11 (Spring–Summer Term): Externally Set Assignment – Component 2**	**Portfolio is assessed and the marks are recorded for PPE2**	

	In the second half of Year 11, students undertake Component 2: the Externally Set Assignment, which forms 40% of their final GCSE grade. AQA releases a selection of seven broad themes from which students choose one to develop into a personal design brief. During the preparatory period, students follow a creative process similar to that used in Component 1, applying skills in research, idea development, material experimentation, and critical reflection. They produce a body of work that evidences their journey through the four assessment objectives: • AO1: Developing ideas through investigations • AO2: Refining work through experimenting with materials and techniques • AO3: Recording ideas and observations • AO4: Presenting a personal and meaningful final outcome This work culminates in a final outcome, produced under 10 hours of supervised exam conditions, typically split across two school days. During this time, students realise their design intentions by making a final 3D prototype that resolves their project concept.		