**Curriculum Intent**

At LPSB, Design and Technology students are truly environmentally aware problem solvers. They understand form, function and aesthetics, making them conscious citizens who can contribute effectively to their community. They know what technologies we can use to make certain designs and by KS5 they have a circular economy understanding of the products they design and construct. Students have the confidence to be able to look around themselves in daily life and think of design solutions to a problem, extending their knowledge and understanding of Design and Technology. They understand how design can improve stakeholders’ lives, and they can independently design products that are useful, functional and aesthetically pleasing, showing thought about concepts like inclusivity and usability. Our curriculum is logically sequenced from Year 7 to Year 13 developing their independence and enquiry skills through analytical research and evaluative thinking skills. We have assessment throughout the key stages that informs students of their progress.

We offer two A-Level pathways from which students can select: Product Innovation and Engineering.

**Curriculum Implementation KS5**

|  |  |  |  |
| --- | --- | --- | --- |
|   | **Autumn** | **Spring** | **Summer** |
| HT1 | HT2 | HT3 | HT4 | HT5 | HT6 |
| **Year 12** | **BROAD** | Core content, knowledge and skills Component One (Theory) | FisHWhale Badge Copyright outlineproject: Understanding manufacturing processes usingPolymers, Metals and Timber. Including Heat treatments and Casting | Material selection and propertiesPapers and boardsPolymersTimberLooking at materials and their properties | Design History & Design Movements:Arts and Crafts. Art Deco. Bauhaus. Memphis. Streamlining. Postmodernism | Materials and properties continued | Anthropometrics and ergonomicsAdhesivesMechanical fastenings | Health and SafetyDrawing conceptsWaste minimisation |
| Core content, knowledge and skills Component Two (coursework)**PRODUCT INOVATION**  | Skills project: BirDHouseBadge Copyright outlineFPT using core workshop machines, including laser cutting, CNC routing and SolidWorks | Skills project completionSolidWorks introduction and AI based on design movements in card/CAD modelling | LightUP Badge Copyright outline projectDesign movements. Iterative designingInvestigating the work of others | LightUPBadge Copyright outline project continued design and development using iterative skills | LightUPBadge Copyright outline project continued. Manufacturing the product and evaluation | Start of final NEA. Students choose their client and explore a series of design opportunities through research and interviews |
| Core content, knowledge and skills Component Two (coursework)**ENGINEERING** | Chair project: StructuresBadge Copyright outline | Completion of Whistle Badge Copyright outlineproject | Completion of AmplifierBadge Copyright outline project | LightUPBadge Copyright outline project | LightUPBadge Copyright outlineproject | Start of final NEA |
| WhistleBadge Copyright outline project using Engineering machines | AmplifierBadge Copyright outline project using electronics and lamination processes | LightUP Badge Copyright outlineproject usingArchitectural concepts Le Corbusier, Art deco and the London Skyline |
| Extra-curricular opportunities | We have an open house policy in DT where sixth formers can use the workshops in their non-contact time if there is a teacher available to supervise. Students are also respected to be able to use the department ICT facilities independently.  |
| Ways the KS5 curriculum goes beyond the examination requirements | The innovation course is structured so that all students gain experience using the wide range of machines and equipment that we have available in the department. This course is specifically designed for these students and any student who would like to grow more confident with the core machines, compliant/modelling materials and CAD/CAM skills. All students on the engineering course are taught extended skills on how to use Engineering machines and processes such as the Lathe and the milling machine to further their existing core practical knowledge. Students are expected to consider designs that make use of mathematical and structural concepts in component.We take students on trips to Red House in Bexleyheath, the Mini factory in Oxford and London museums and exhibitions. Component one is taught using case studies and practical processes where some learning is flipped. This requires Students to complete their own research into some of the processes in their non-contact time to meet the demands and pace of the theory lessons in Component 1.  |
| **COHERENT** | Prior knowledge required to access this unit | This term is about skills, materials and processes used in manufacturing products. This enables students across both courses to increase their knowledge and skills on manipulating and joining different types of materials, some of which is examined in the component one examination or used to manufacture products in component two | Students study Design history and key designers and concepts in component one and incorporate this knowledge into their lightUP Badge Copyright outlineproject when designing and developing. Alongside further developing their knowledge of materials and their properties. | Students revisit knowledge on skills and processes and develop further joining and fastening techniques considering health and safety in the processes used in the workshop and industry. Students use this knowledge to complete their lightUPBadge Copyright outline project intime for the Summer exhibition where they will display their component two outcomes. Students start to understand how to become responsible designers and choose their final NEA focus area. |
| Assessment component one (Innovation and Engineering) | Bridging Unit: case study | Autumn term written assessment. | Case study: Design history | Spring term written assessment | Long answer question ergonomics  | Summer term written assessment |
| Assessment component two (Innovation) | BirDHouse project | LightUPBadge Copyright outline Research assessment | LightUPBadge Copyright outline Development assessment | LightUPBadge Copyright outline manufacturing assessment | Investigating a client assessment |
| Assessment component two (Engineering) | Whistle project |
| Points when this knowledge/these skills will be revisited | This term is about skills, materials and processes used in manufacturing products. This enables students across both courses to increase their knowledge and skills on manipulating and joining different types of materials, some of which is examined in the component one examination or used to manufacture products in component two. | Students study Design history and key designers and concepts in component one and incorporate this knowledge into their LightUP Badge Copyright outlineproject when designing and developing. Alongside further developing their knowledge of materials and their properties. | Students revisit knowledge on skills and processes and develop further joining and fastening techniques, considering health and safety in the processes used in the workshop and industry. Students use this knowledge to complete their LightUPBadge Copyright outline project in time for the Summer exhibition where they will display their component two outcomes. Students start to understand how to become responsible designers and choose their final NEA focus area. |
| **EMPOWERING** | Key vocabulary | Lathe, Faceoff, Chamfer, Chuck, Technical Drawings, Metals, Ferrous, Non-Ferrous Casting, Annealing, Hardening, Tapping, Mechanical Fixings, Heat Treatments, CNC, CAD. | Properties, Sustainability, Manufacture, Design Movements, Ethos, Printed Circuit Boards – PCBs, Components, Design Iterations Client Profile, Target Market. | Life Cycle Analysis, Sustainability, HSE, Knock Down Fittings, Arts And Crafts. Art Deco. Bauhaus. Memphis. Streamlining. Postmodernism. | Ergonomics, Anthropometrics, User Centred Design, Iterative Design Approach, Unique Selling Points, Client, Reviews, Evaluation, Testing. | Isometric, Perspective, 3d, Investigation, Mind Mapping, Client. |
| Opportunities to engage with different cultures/ perspectives/ voices | Students are taught inclusive design where they engage with designs from other cultures, social and economic backgrounds. Students also are expected to engage in user centred design, where perspectives of others are constantly sought and evaluated.  |
| Relevance to real-world and careers |  Design and Technology is a highly sought after qualification because of its development of problem solving, project management, planning and reflective and evaluative skills. Specialist careers include: all types of Engineering (such as mechanical engineering, structural engineering), Architecture, product design, CAD engineer, software designer, Games designer, industrial designer and other design careers. |
| **CHALLENGING** | Homework | Set on Teams, weekly by both components.Flipped learning is used in component one with an assessment in the second half of the term. |  Set on Teams, weekly by both components. A mixture of design tasks, reading and examination questions to answer. | Set on Teams, weekly by both components.  |
| Super curricular recommendations | [Think Like an Engineer by Guru Madhavan | Goodreads](https://www.goodreads.com/book/show/26132781-think-like-an-engineer)*Dubai’s Burj Khalifa – the world’s tallest building – looks nothing like Microsoft’s Office Suite, and digital surround sound doesn’t work like a citywide telecommunication grid. Yet these engineering feats have much in common: they are the result of a unique thinking process combining abstract and structured thinking, common sense and great imagination. They are born of the engineering mindset.* |
|  | [Sketch A Day - YouTube](https://www.youtube.com/user/sketchadaydotcom) *Improve your drawing skills with this you tube channel* |
| [Icons of Design: The 20th Century by Albus, Volker (amazon.com)](https://www.amazon.com/Icons-Design-20th-Century-Prestels/dp/3791323067) *The stunning objects in this fully illustrated volume include furniture and household appliances, cars and toys as well as many other design items which transcended their everyday utility to achieve iconic status during the twentieth century.* |
| [Zaha Hadid: The Complete Buildings and Projects: Amazon.co.uk: Hadid, Zaha, Betsky, Aaron: 9780847821334: Books](https://www.amazon.co.uk/Zaha-Hadid-Complete-Work/dp/0847821331) *With her most recent commission, Cincinnati's Contemporary Arts Center, architect Zaha Hadid becomes the first woman ever to design an American museum.* |
| <https://youtu.be/LrtMUzZ_0TQ> Architect Thomas Heatherwick shows five recent projects featuring ingenious bio-inspired designs. Some are remakes of the ordinary: a bus, a bridge, a power station ... And one is an extraordinary pavilion, the Seed Cathedral, a celebration of growth and light. |
| [Podcasts By Women In STEM - The Stemettes Zine](https://stemettes.org/zine/articles/podcasts-by-women-in-stem-you-need-to-listen-to/) [eSTEAMd Women (formerly Scilence & Innervation) | Podcast on Spotify](https://open.spotify.com/show/56wluOPtYm8SLb6K6L3mc4?go=1&sp_cid=8145eb7a6d6c5097dd9df7f4035804bb&utm_source=embed_player_p&utm_medium=desktop&nd=1&dlsi=d9271302b2e54fdf) Podcasts about women navigating a male dominated career area |
| [LEGO House documentary - Home Of The Brick (UK) - YouTube](https://www.youtube.com/watch?v=JKC9CEk-aUI)  |

|  |  |  |  |
| --- | --- | --- | --- |
|   | **Autumn** | **Spring** | **Summer** |
| HT1 | HT2 | HT3 | HT4 | HT5 | HT6 |
| **Year 13** | **BROAD** | Core content, knowledge and skills Component One (Theory) | Built-in obsolescence.RepairBiodegradabilityCircular economyFairtrade | Project management strategiesQuality monitoring systemsCurrent legislationStandardsProperty rights | NEA PART 3: Practical | Manufacturing methods and systemsMaths in DTRevision for final examination | Revision for Component 1: final examination |
| Core content, knowledge and skills Component Two (coursework)*Both Innovation and Engineering* | NEA CourseworkPART 1: investigationPART 2: design and Development | NEA CourseworkPART 2: Design and development |  | Revision for Component 1 (final examination) |  |
| Ways the KS5 curriculum goes beyond the examination requirements | The innovation course is structured so that all students gain experience using the wide range of machines and equipment that we have available in the department. This course is specifically designed for these students and any student who would like to grow more confident with the core machines, compliant/modelling materials and CAD/CAM skills. All students on the engineering course are taught extended skills on how to use Engineering machines and processes such as the Lathe and the milling machine to further their existing core practical knowledge. Students are expected to consider designs that make use of mathematical and structural concepts in component.We take students on trips to Red House in Bexleyheath, the Mini factory in Oxford and London museums and exhibitions. Component one is taught using case studies and practical processes where some learning is flipped. This requires Students to complete their own research into some of the processes in their non-contact time to meet the demands and pace of the theory lessons in Component 1.  |
| **COHERENT** | Prior knowledge required to access this unit |  All prior learning gained to this point. |
| **EMPOWERING** | Key vocabulary |  Built-in obsolescence.BiodegradabilityCircular economyFairtrade | Gantt chart PDM, ERP, TQM, Patent  | User centred designingAesthetics |  FMS, CIM, CADMAT, Lean manufacturing |   |   |
| **CHALLENGING** | Super curricular recommendations | [I Want To Study Engineering (i-want-to-study-engineering.org)](https://i-want-to-study-engineering.org/) Visit this website to find more about studying engineering |
| A Career in Architecture: If you have an interest in Architecture or are considering it as a future career, then read the following.* Bachelard, The Poetics of Space
* Davidson Cragoe, How to Read Buildings
* Pallasmaa, The Eyes of the Skin
* Perec, Species of Spaces and other Pieces
 |
|  | Subscribe to daily and weekly newsletters. [Designboom](https://www.designboom.com/) is the world’s first and most popular digital architecture and design magazine |
|  | Listen to 'Designed for Life' **A series of podcasts from creative industry designers who discuss their work, technology and what they have learned through failure, trial and error. Listen**[**here**](https://podcasts.apple.com/gb/podcast/designed-for-life/id1528885120) |
|  | [10 Essential Freehand Drawing Exercises for Architects | ArchDaily](https://www.archdaily.com/801871/10-essential-freehand-drawing-exercises-for-architects) Complete the following 10 tasks to improve your drawing and design skills.   |
|  | CAD SupportUsing your Solidworks education account, download one of the other software packages to support your CAD journey.Revit – Architecture. Inventor - Product Design. Maya - Animation  |