

## Scheme of Work 2020 - 2021

### Subject: Engineering

**Year Group:10**

**Specification: Pearson L2 Tech Award Engineering**

Lesson No	Topic & Objectives	Big Question – What will students learn?	Key Activities & Specialist Terminology (Do Now Task / Starter/Tasks/Plenary	Planned Assessment	Homework or flipped learning resources  DODDLE resources	Lit Num SMSC Codes
-----------	--------------------	--	---	--------------------	--	--------------------

**ADP Codes:**

Sp2 – Students have access to outstanding learning opportunities – The department is resourced to ensure all students have access to outstanding learning experiences.

C5 – Students reach full potential as barriers have been removed – All learning objectives and tasks – allow scope for differentiation – ensuring all learners are given a chance to learn and progress.

Sp5 – Students take responsibility for their own learning journeys – This is encouraged and facilitated with all internal assessment tasks.

Sp9 – Creating enjoyment and fascination in learning – Practical component of Engineering allows students to gain first-hand experience of curriculum content – creating a more enjoyable and fascinating learning experience.

C3 – Foster a passion for learning – Specialist teachers with a passion and enthusiasm for their subjects bring first-hand experience into the classroom – fostering a passion for learning.

M1 – All stakeholders’ model resilience, positive relationships attitudes and behaviours – all social opportunities in lessons and behaviour expectations made clear by teachers. Attitude to lifelong learning modelled by teaching staff.

### Term One

1	<p><b>Component 2 Aim A</b></p>	<p>Introduction to key dates and expectations of this component.</p> <p>What are the basic components that make up an engineered product?</p> <p><b>Understand the difference between standard and specialist components.</b></p>	<p>Looking at existing products. Spotting the different components they have in common. What are these parts?</p> <p>Why use the same components in different products?</p> <p>Understand the advantages of using off-the shelf components for initial manufacture, cost and maintenance.</p> <p>Students to explore the DIY.com website to find nuts, bolts, screws and washers.</p> <p>Students to look at wholesale prices and answer key question – why does the unit cost decrease with the more units purchased?</p>	<p>Verbal, open questioning.</p> <p>Assessment activities in Aim A booklet.</p> <p>Crossword task.</p> <p>Peer assessment of descriptions of standard / product specific.</p>	N/A	<p>Sp5 – Students take responsibility for their own learning journeys.</p> <p>Num – Cost calculations of wholesale units.</p>
---	---------------------------------	---	--	---	-----	---

2	<b>Component 2 Aim A</b>	<p>What are the basic components that make up an engineered product?</p> <p><b>Understand the roles of the different standard components in a bike brake assembly.</b></p>	<p>Looking at existing products. Spotting the different components they have in common. What are these parts?</p> <p>Literacy task – Comprehension with questions. Why use specialist components in products with unique functions?</p> <p>Students to find examples of specialist equipment online (medical equipment, construction equipment etc) and list the product specific components.</p>	<p>Teams quiz.</p> <p>Assessment activities in Aim A booklet.</p> <p>Wheel of fortune Q&amp;A plenary task.</p> <p>Peer assessment of descriptions product specific components.</p>	<p>Complete descriptions of standard / product specific components in MS Teams.</p>	<p>So8 – Opportunities for extended reading.</p> <p>Lit – Extended reading task and comprehension questions.</p>
3	<b>Component 2 Aim A</b>	<p>What components are on a simple bike brake callipers?</p> <p><b>Understand the roles of the different specialist components in a bike brake assembly.</b></p>	<p>Discussion on what brake callipers are and how they work. Teacher demonstration using a bicycle.</p> <p>Watch a YouTube video on how brake callipers work.</p> <p>Students can investigate and report in groups.</p> <p>Refer to the transfer of force between a brake lever and a calliper arm.</p>	<p>Short group report – how to brake callipers work?</p> <p>Vocabulary crossword.</p>	<p>N/A</p>	<p>SP1 – Students have a voice that is heard.</p>
4	<b>Component 2 Aim A</b>	<p>Dismantle and catalogue all parts on a bicycle braking system.</p> <p><b>Identifying different metals and polymers used in the manufacture of the components.</b></p>	<p>In groups of 2 / 3, students will dismantle and catalogue a bicycle braking system.</p> <p>Students will attempt to name each component and place on flip chart paper.</p> <p>Students will attempt to identify the materials used for each component using the material description flashcards.</p>	<p>Check ledger of all parts.</p> <p>Assessment activities in Aim A booklet.</p> <p>Kahoot Quiz – Materials (BZP, Stainless steel, mild steel, Polypropylene and Nylon)</p>	<p>Complete descriptions of standard / product specific components in MS Teams.</p>	<p>C3 – Foster a passion for learning – practical learning and DIY activities – Bicycle Maintenance.</p>
5	<b>Component 2 Aim A</b>	<p>Dismantle and catalogue all parts on a bicycle braking system.</p> <p>Learn how to use tools to dismantle products to learn about</p>	<p>Weigh and measure all of the parts using vernier calliper and digital scales.</p> <p>Understand how to tare the scales and how to work around components that weigh less than 1g.</p>	<p>Record findings in MS teams.</p> <p>Q&amp;A session on how the uses and functions</p>	<p>N/A</p>	<p>Num – Decimal places and division.</p>

		their construction , assembly and function.	Write a description of each component on MS teams assessment sheet.	of types of screws, nuts and bolts.		
6	<b>Component 2 Aim A</b>	<p><b>Ongoing:</b> Dismantle and catalogue all parts on a bicycle breaking system.</p> <p>Learn how to use tools to dismantle products to learn about their construction, assembly and function.</p>	<p>Weigh and measure all of the parts using vernier calliper and digital scales.</p> <p>Understand how to tare the scales and how to work around components that weigh less than 1g.</p> <p>Write a description of each component on MS teams assessment sheet.</p>	<p>Record findings in MS teams.</p> <p>Q&amp;A session on how the uses and functions of types of screws, nuts and bolts.</p>	Complete descriptions in MS Teams	Num – Decimal places and division.
7	<b>Component 2 Aim A</b>	<p><b>Ongoing:</b> Dismantle and catalogue all parts on a bicycle breaking system.</p> <p>Learn how to use tools to dismantle products to learn about their construction, assembly and function.</p>	<p>Weigh and measure all of the parts using vernier calliper and digital scales.</p> <p>Understand how to tare the scales and how to work around components that weigh less than 1g.</p> <p>Write a description of each component on MS teams assessment sheet.</p>	<p>Record findings in MS teams.</p> <p>Q&amp;A session on how the uses and functions of types of screws, nuts and bolts.</p>	N/A	Num – Decimal places and division.
8	<b>Component 2 Aim A</b>	<p><b>Ongoing:</b> Dismantle and catalogue all parts on a bicycle breaking system.</p> <p>Learn how to use tools to dismantle products to learn about their construction, assembly and function.</p>	<p>Weigh and measure all of the parts using vernier calliper and digital scales.</p> <p>Understand how to tare the scales and how to work around components that weigh less than 1g.</p> <p>Write a description of each component on MS teams assessment sheet.</p>	<p>Record findings in MS teams.</p> <p>Peer Assessment _ progress review</p> <p>Use of colour coded PLC for students to check progress against assessment dates.</p>	<p>Complete descriptions in MS Teams.</p> <p>Further research.</p>	Num – Decimal places and division.
9	<b>Component 2 Aim A</b>	<p>Research different components found on bicycle brakes.</p> <p>Learn how to conduct secondary research using textbooks and internet sources.</p>	<p>Use textbooks and internet to gather information on the different parts and materials that the braking system is comprised of.</p> <p>Conduct secondary research (textbook and <a href="http://www.technologystudent.com">www.technologystudent.com</a>) of unique properties of each material.</p>	Record findings in Assessment table on MS teams	N/A	

10	<b>Component 2 Aim A</b>	<p><b>Ongoing:</b> Research different components found on bicycle brakes.</p> <p>Learn how to conduct secondary research using textbooks and internet sources.</p>	<p>Use textbooks and internet to gather information on the different parts and materials that the braking system is comprised of.</p> <p>Conduct secondary research (textbook and <a href="http://www.technologystudent.com">www.technologystudent.com</a>) of unique properties of each material.</p> <p>Record thoughts and reflections as to why these materials have been used in a bike brake application.</p>	Record findings in Assessment table on MS teams	Crossword – Components and materials.	Lit – Developing technical vocabulary.
11	<b>Component 2 Aim A</b>	Learn how to produce an extended technical analysis of engineered products.	<p>Students to choose components of their choice from the bike brake and write an extended description of:</p> <ul style="list-style-type: none"> <li>• Functions and purposes</li> <li>• Material selection</li> <li>• Sizes, tolerances and shapes.</li> <li>• Manufacturing techniques used.</li> </ul>	<p>Wheel of fortune – STARTER – Q&amp;A about materials and their suitability in the bike brake assembly.</p> <p>Peer assessment – proof reading and offering feedback.</p>	N/A	
12	<b>Component 2 Aim A</b>	<p>Learn about the stamping manufacturing process – its advantages, disadvantages and common uses.</p> <p>Students will also understand the basic steps involved in carrying out the process.</p>	<p>Teacher to deliver information – using PPT, videos and demonstrations about the stamping process.</p> <p>Students to create a comic book style strip on flipchart paper (in groups) explaining how the stamping process works for washers.</p> <p>2 chosen groups will present their comic strips to the class.</p> <p>Students are to record their new knowledge in MS Teams – In their coursework booklets and relate each process to a component from the bike brake.</p>	<p>Kahoot Quiz</p> <p>Colour coded plc.</p>	MS Teams – Continue with coursework targets.	Sp1 – Students have a voice that is heard.
13	<b>Component 2 Aim A</b>	<p>Learn about the injection moulding manufacturing process – its advantages, disadvantages and common uses.</p> <p>Students will also understand the basic steps involved in carrying out the process.</p>	<p>Teacher to deliver information – using PPT, videos and demonstrations about the IM process.</p> <p>Students will injection mould their own toy car wheel (groups of 2) using the injection moulding machine.</p>	<p>Colour coded plc.</p> <p>Injection moulding crossword (Plenary)</p>	MS Teams – Continue with coursework targets.	Sp9 – Creating enjoyment and fascination in learning.

			Students are to record their new knowledge in MS Teams – In their coursework booklets and relate each process to a component from the bike brake.			
14	<b>Component 2 Aim A</b>	Learn about the bending and coiling process – its advantages, disadvantages and common uses.  Students will also understand the basic steps involved in carrying out the process.	Teacher to deliver information – using PPT, videos and demonstrations about the bending and coiling processes.  Students will bend an aluminium rod using a jig.  Students are to record their new knowledge in MS Teams – In their coursework booklets and relate each process to a component from the bike brake.	Wheel of Fortune – Q&A on Injection moulding.  Colour coded plc.	N/A	

**Term One  
Second Half**

1	<b>Component 2 Aim A</b>	Learn about the casting process (die, aluminium, sand) used to manufacture 3d metallic components - its advantages, disadvantages and common uses.  Students will also understand the basic steps involved in carrying out the process.	Teacher to deliver information – using PPT, videos and demonstrations about the casting process for metals.  Students (in groups of 3) to Pewter cast a basic shape of their choice using the brazing hearth and a simple mould.  Students are to record their new knowledge in MS Teams – In their coursework booklets and relate each process to a component from the bike brake.	Peer Assesemnt of Pweter Casting outcomes.  H&S Crossword – Pewter casting.	Worksheet – label the tools and equipment used during pewter casting process.	Sp7 – Risk Managment
2	<b>Component 2 Aim A</b>	Learn about scales of production (one-off, batch and mass) and learn to evaluate process suitability for different scales of demand and production.	Take a close look at all of the most common manufacturing processes (PPT and teacher delivery with Q&A throughout)  Refer to: <ul style="list-style-type: none"> <li>• Quantity required</li> <li>• Set up costs</li> <li>• Waste material</li> <li>• Speed of production</li> <li>• Consistency of outcome</li> <li>• Level of human intervention / automation</li> </ul>	Q&A starter session – random name generator (classtools.net)  Colour coded plc.	N/A	

			Extended writing task using MS teams – Justification of manufacturing processes used for the bike brake.			
3	Component 2 Aim A	List the manufacturing processes used in making the brakes.	List the different processes used in the production of the brakes parts. This can have step by step stages of production.	Teams assignment.	Complete teams assignment (P2)	
4	Component 2 Aim A	Justification of each process.	Each process will have to be justified for each specific part.	Teams assignment.	N/A	
5	Component 2 Aim A	Justification of each process.	Each process will have to be justified for each specific part.	Teams assignment.	Complete teams assignment (M1)	
	Component 2 Aim A	Evaluate materials, proprietary components and processes.	List a number of different materials, proprietary components and processes. Justify why you would use these over others.	Teams assignment.	N/A	
6	Component 2 Aim A	Evaluate materials, proprietary components and processes.	List a number of different materials, proprietary components and processes. Justify why you would use these over others.	Teams assignment.	Complete teams assignment (D1)	
7	<b>Component 2 Aim A</b>	Review work completed this half term	Review work completed this term independently.	Make alterations to teams work.	Teams	
8	Component 2 Aim A	Justification of each process.	Each process will have to be justified for each specific part.	Teams assignment.	N/A	
9	Component 2 Aim A	Justification of each process.	Each process will have to be justified for each specific part.	Teams assignment.	Complete teams assignment (M1)	

10	Component 2 Aim A	Evaluate materials, proprietary components and processes.	List a number of different materials, proprietary components and processes. Justify why you would use these over others.	Teams assignment.	N/A	
11	Component 2 Aim A	Evaluate materials, proprietary components and processes.	List a number of different materials, proprietary components and processes. Justify why you would use these over others.	Teams assignment.	Complete teams assignment (D1)	
12	<b>Component 2 Aim A</b>	Review work completed this half term	Review work completed this term independently.	Make alterations to teams work.	Teams	