

Scheme of Work 2020 - 2021

Subject: Engineering

Year Group: 11

Specification: Pearson Tech Level L1/2 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
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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 First Half

1	<p>Component 3 Aim A</p> <p>Design and manufacture</p>	<p>What can you design on an aeroplane?</p>	<p>Teacher introduction to component aims and expectations.</p> <p>Focussed practical task – Create a simple paper airplane and test it.</p> <p>Thinking task: Design a production plan on how to create a paper airplane.</p> <p>Peer review: What else could have been considered when giving manufacturing instructions?</p>	<p>Students will compare the results of how far their aeroplane flew with the results of their peers.</p> <p>Peer assessment of production plans against teacher-given criteria.</p>	<p>This will be a flipped learning lesson.</p>	<p>Lit – Subject specific vocabulary</p> <p>Lit – Opportunities for extended writing</p> <p>Num – References to dimensions and measurements</p>
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2	<p>Component 3 Aim A</p> <p>Following a plan procedure.</p>	Can you follow a planned procedure created by a student?	You have previously written a production plan for an engineering activity. Exchanger put plan with a partner and then carry out the following activities.	Assessment for this will be via the teacher giving verbal feedback at the end of lesson.	This is a flipped learning lesson because the students are teaching the students and teacher.	<p>Lit – Subject specific vocabulary</p> <p>Lit – Opportunities for extended writing</p> <p>Num – References to dimensions and measurements</p>
3	<p>Component 3 Aim A</p> <p>Prototypes and models</p>	Can you design A prototype?	Prototypes were made for many products that are developed by engineers. Find an example of a photo type of product that you are interested in and make notes on it.	This will be produced on a Word document and submitted for feedback by the teacher at the end of lesson.	Resource is needed for this would be a computer and access to the Internet.	<p>Lit – Subject specific vocabulary</p> <p>Lit – Opportunities for extended writing</p> <p>Num – References to dimensions and measurements</p>
4	<p>Component 3 Aim A</p> <p>Understanding how a product is assembled</p>	Can you use basic tools to dismantle an engineered product?	Practice dismantling on a product has at least 6 components.	This will be a visual assessment to see if the student has been able to properly disassemble the engineered product into at least six components.	To complete this task students will actually need a set of tools and an engineered product to dissemble.	<p>Lit – Subject specific vocabulary</p> <p>Lit – Opportunities for extended writing</p>

						Num – References to dimensions and measurements
5	<p>Component 3 Aim A</p> <p>Handling and using materials, equipment and machinery.</p>	Can you safely handle all materials with your hands unprotected?	Engineers work with many different types of materials, each with different handling requirements. Research method of handling a range of metallic and polymer materials.	This will be submitted in the form of a report on paper which will be graded and fed back to the students the next day.	Resource is with this will be access to the Internet and paper this can be printed if the student wishes.	<p>Lit – Subject specific vocabulary</p> <p>Lit – Opportunities for extended writing</p> <p>Num – References to dimensions and measurements</p>
6	<p>Component 3 Aim A</p> <p>Recording the process</p>	Can you record the components found?	Working with a partner collect a random selection of either mechanical fixings or other components. Separate the components into groups or categories and carry out investigations into Them.	This will be done in pairs so peerto peer assessment will be the best option.	To complete this students will need the actual components that they have disassembled and some method to record them.	<p>Lit – Subject specific vocabulary</p> <p>Lit – Opportunities for extended writing</p> <p>Num – References to dimensions and measurements</p>
7	<p>Component 3 Aim A</p> <p>Display data using charts or graphs</p>	Can you gather and display visually different information?	Using different types of collectors are that you teacher has provided, produce an example of each different type of chat. It is important that we present	Assessment for this will be a visual inspection of the graphs produced feedback will be given on the spot.	Students will need some form of information to gather and display on a graph.	Lit – Subject specific vocabulary

			results in the investigation with accuracy.			<p>Lit – Opportunities for extended writing</p> <p>Num – References to dimensions and measurements</p>
8	<p>Component 3 Aim A</p> <p>Displaying data using lines of best fit</p>	What is the best graph to use?	Carry out an investigation to see how much the spin extends underneath the floating. You will need to measure the attention of the spring for each 5 loads.	Students will compare results of displaying different data against that of their peers.	Students will need the equipment to draw whatever graph they feel necessary to display the data.	<p>Lit – Subject specific vocabulary</p> <p>Lit – Opportunities for extended writing</p> <p>Num – References to dimensions and measurements</p>
9	<p>Component 3 Aim A</p> <p>Interpret data</p>	Can you read data from a graph?	Find a table from the internet. Make sure there are 10 rows on the table. Draw a line of best fit for this table.	Students will be assessed on the data that they have received from the graph this will be by the teacher at the end of lesson and feedback will be given.	Equipment needs will be graph paper rulers pencils colouring pencils and access to the Internet.	<p>Lit – Subject specific vocabulary</p> <p>Lit – Opportunities for extended writing</p> <p>Num – References to dimensions and measurements</p>

10	<p>Component 3 Aim A</p> <p>Evaluating processors, drawing conclusions and making recommendations.</p>	Using the information you have discovered can you produce a conclusion?	Working with a partner, check the accuracy of a sample of parts.	This lesson will be assessed via peer to peer assessment.	Students will have to have access to their work to complete this lesson.	<p>Lit – Subject specific vocabulary</p> <p>Lit – Opportunities for extended writing</p> <p>Num – References to dimensions and measurements</p>
11	<p>Component 3 Aim A</p> <p>Reading brief and studying demonstration</p>	What is the product you have been given? What is its purpose?	You will be given information about how to prepare your investigation. A scenario will be given to you along with a list of equipment that you will need. Your teacher will demonstrate how to carry out their investigation, and then you will complete the set task on your own.	Students will be assessed at the end once all of this scenario has been fully submitted.	Equipment and brief.	<p>Lit – Subject specific vocabulary</p> <p>Lit – Opportunities for extended writing</p> <p>Num – References to dimensions and measurements</p>
12	<p>Component 3 Aim A</p> <p>Completing the experiment.</p>	Can you complete the experiment and record your findings?	Once the students have seen the demonstration they can complete the experiment themselves and record all of their findings.	Once the exam is finished students will be submitted for feedback the next lesson.	Equipment and brief will need to be supplied.	<p>Lit – Subject specific vocabulary</p> <p>Lit – Opportunities for extended writing</p>

						Num – References to dimensions and measurements
13	Component 3 Aim A Review work completed	Now that you have received feedback where have you gone wrong in your mock exam?	Take a look at the results of the test they have just taken and give feed. Find areas where you can improve	Students will review their feedback and suggest areas of improvement which will be assessed by the teacher.	Students will need their mock papers.	Lit – Subject specific vocabulary Lit – Opportunities for extended writing Num – References to dimensions and measurements
14	Component 3 Aim A Putting feedback into place.	What changes will you need to make to your mock paper to improve it?	Take a look at the results of the test they have just taken and give feedback.	Once the mock papers have been improved they will be resubmitted for a second round of marking.	Copies of the students work will be needed.	Lit – Subject specific vocabulary Lit – Opportunities for extended writing Num – References to dimensions and measurements

Term One
Second Half

1	<p>Aim B</p> <p>Interpretation of a given brief for engineer product</p>	What is the brief asking you to do?	Research an engineered product, either by looking on the internet or by examining a physical product.	Students will be assessed via a rapid fire questioning at the end of the lesson to see if they understand what the brief is asking them about their product.	Access to the Internet and the actual product will be needed in this lesson.	<p>Lit – Subject specific vocabulary</p> <p>Lit – Opportunities for extended writing</p> <p>Num – References to dimensions and measurements</p>
2	<p>Component 3 Aim B</p> <p>Features of engineered products.</p>	What components have been fabricated?	Working with your partner, research an example of a fabricated component.	Students will work together and it will be pure to peer assessment	Students will need the product and a piece of paper to write results on and tools for dismantling.	<p>Lit – Subject specific vocabulary</p> <p>Lit – Opportunities for extended writing</p> <p>Num – References to dimensions and measurements</p>
3	<p>Component 3 Aim B</p> <p>Selecting engineering materials.</p>	Can you list the materials and their properties that have been used in the product?	Find an example of an engineered product and examine the product to identify the material used to make it.	Students will assess each other as to their knowledge of the materials .	The product and access to the Internet will be needed.	<p>Lit – Subject specific vocabulary</p> <p>Lit – Opportunities for extended writing</p>

						Num – References to dimensions and measurements
4	Component 3 Aim B Manufacturing processes	What manufacturing processes were used in the creation of your product?	Examine an engineered product and investigate the manufacturing processes used to make it.	Rapid fire questioning at the end of lesson will be used as assessment as to whether the students understand the processes or not.	Students will need access to the Internet.	Lit – Subject specific vocabulary Lit – Opportunities for extended writing Num – References to dimensions and measurements
5	Component 3 Aim B Redesign	What improvements do you think you could make?	Look at some design sketches for the re design of existing product. Although the ideas might have many features in common, there may also be a lot of variation in approach.	Once completed students will submit their work to be marked by the teacher feedback will be given the next day.	Access to coursework and examples.	Lit – Subject specific vocabulary Lit – Opportunities for extended writing Num – References to dimensions and measurements
6	Component 3 Aim B 3d sketching	Can you communicate your idea graphicly?	Some simple engineering components. Sketch them using each of the 3 techniques <ul style="list-style-type: none"> • Oblique projection • Isometric projection 	Assessment will be given verbally as to the accuracy of their sketches.	Equipment needed maybe pens pencils rulers, paper, and light box.	Lit – Subject specific vocabulary

			<ul style="list-style-type: none"> Perspective drawing 			<p>Lit – Opportunities for extended writing</p> <p>Num – References to dimensions and measurements</p>
7	<p>Component 3</p> <p>Aim B</p> <p>Exploded diagram</p>	Can you draw an exploded diagram of your product?	For an engineered product that you have investigated and dismantled previous city, produce and exploded diagram to show how it is assembled.	Peer to peer assessment	Students will need pencils and paper and ruler.	<p>Lit – Subject specific vocabulary</p> <p>Lit – Opportunities for extended writing</p> <p>Num – References to dimensions and measurements</p>
8	<p>Component 3</p> <p>Aim B</p> <p>Electronic circuit diagrams.</p>	Can you draw a circuit schematic?	Use the internet to research the symbol used for a range of electronic vote for supp create a table includes description, image and schematic.	Teacher will conduct visual inspections of the circuit schematic.	Students will need a computer an access to every circuit software.	<p>Lit – Subject specific vocabulary</p> <p>Lit – Opportunities for extended writing</p> <p>Num – References to dimensions and measurements</p>

9	Component 3 Aim B Design for manufacture	What process might you use to design for a manufactured product?	Find an example of an engineer product that is made from 2 or 3 components that fit together	This will be assessed by their peers in the form of a presentation.	Students will need access to computers Internet and a USB.	Lit – Subject specific vocabulary Lit – Opportunities for extended writing Num – References to dimensions and measurements
10	Component 3 Aim B Variations in form to solve a problem.	How much you change the shape of the product to solve their problem?	You have been asked to design engineer part that you used to support portable hard disk drive what is used in laptop.	This will be reviewed by teacher in lesson..	Computer and powerpoint will be needed to complete this task.	Lit – Subject specific vocabulary Lit – Opportunities for extended writing Num – References to dimensions and measurements
11	Component 3 Aim B Variations in problem solving.	Are there different methods to solve problems in design?	Find a range of engineering product that meet the same general design requirements.	Students can peer review this work at the end of lesson.	Students will need access to the Internet and to powerpoint's drawing software.	Lit – Subject specific vocabulary Lit – Opportunities for extended writing

						Num – References to dimensions and measurements
12	Component 3 Aim B Using different componentry.	Are there different types of components?	For a sampled engineering product, investigate the possible use of alternative components as part of product redesign.	Rapid fire questions at the end of lesson will help assess the work completed.	Students will need access to different components to use as example and computers.	Lit – Subject specific vocabulary Lit – Opportunities for extended writing Num – References to dimensions and measurements