

**PCHS Curriculum Information**

<b>Course Title:</b> OCR Level 1/2 Cambridge National in Engineering Design	<b>Exam Board:</b> Cambridge National L1/2	<b>Specification Code:</b> J822
<p><b>How will students be assessed?</b></p> <p><b>Examination – Externally assessed exam paper</b></p> <p>Unit name :Principles in engineering design R038</p> <p>Students will sit a one-hour 15 minute examination at the end of Year 11. This is worth 40% of overall marks for the qualification.</p> <p>There will be no opportunity to resit the exam</p> <p><b>None examined unit (NEA) – All units are assessed internally then moderated by the exam board</b></p> <p>Unit R039: Communicating Designs</p> <p>Unit R040: Design evaluation and modelling</p> <p>Each unit is worth 30% of overall marks for the qualification.</p>		

**KEY CONTENT****Half Term 1 & 2****Unit R039: Communicating Designs**

Students will begin this unit of work in this term. It will then be assessed and sent off for external moderation in May of this same academic year.

Learners will be taught:

- 2D/3D sketches
- Thick/thin lines
- Texture
- Tone
- Shading
- Annotation and labelling techniques:
- Isometric projection
- Centre line
- Parts list to include up to 4 parts

- Parts number referencing
- Assembly instructions
- CAD sketch tool features
- CAD reference geometry:
- CAD rendering

**Task 1&2** – Students will undertake topic area 1: Freehand sketches, annotation and design development.

They will then be introduced to Task 3 and 4: Production of Engineering drawings and CAD models.

### **Half term 3 & 4**

**Task 3&4 continued**– Students will complete the CAD work and prepare their assignment for assessment.

### **Half Term 5&6**

Completion of assignments, to be submitted May of same academic year

#### **Unit name :Principles in engineering design R038**

##### 2.1 Types of criteria included in an engineering design specification

- Needs and wants
- Quantitative and qualitative criteria
- Reasons for the product criteria included in the design specification (ACCESS FM)

##### 2.2 How manufacturing considerations affect design

- Scale of manufacture:
- Material availability and form
- Types of manufacturing processes
- Production costs

##### 2.3 Influences on engineering product design

- Market pull and technology push
- British and International Standards
- Legislation
- Planned obsolescence
- Sustainable design (6Rs)
- Design for the circular economy

Then revisit work done in year 10

## Topic Area 1

### 1.1 The stages involved in design strategies

- Linear design
- Iterative design
- Inclusive design
- User-centred design
- Sustainable design
- Ergonomic design

### 1.2 Stages of the iterative design process, and the activities carried out within each stage of this cyclic approach

- Analysis of the design brief
- Methods of researching the product requirements
- ACCESS FM (Aesthetics, Cost, Customer, Environment, Size, Safety, Function, Materials and Manufacturing)
- Product disassembly
- Production of an engineering design specification
- Generation of design ideas by sketching and modelling

#### 1.2.2 Make and evaluate:

- The reasons for the use of modelling
- Physical modelling of the design idea
- Manufacture or modification of the prototype
- Analysis of the design brief
- Methods of researching the product requirements
- ACCESS FM (Aesthetics, Cost, Customer, Environment, Size, Safety, Function, Materials and Manufacturing)
- Product disassembly
- Production of an engineering design specification
- Generation of design ideas by sketching and modelling

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