

PCHS Curriculum Information

Course Title:	Exam Board:	Specification Code:
OCR Level 1/2 Cambridge National in Engineering Design	Cambridge National L1/2	J822

How will students be assessed? Examination – Externally assessed exam paper Unit name: Principles in engineering design R038 Students will sit a one-hour 15-minute examination at the end of Year 11. This is worth 40% of the overall marks for the qualification. There will be no opportunity to resit the exam None-examined unit (NEA) – All units are assessed internally, then moderated by the exam board Unit R039: Communicating Designs Unit R040: Design evaluation and modelling Each unit is worth 30% of the overall marks for the qualification.

KEY CONTENT
Half Term 1 & 2 R040 Design, evaluation and modelling Product Disassembly Students are taught to • Consider the variety and function of components that are housed within the ‘set product’, e.g., device holder. • Establish the most suitable material, production, assembly and manufacturing method. • Use appropriate tools and instruments to undertake the disassembly. • Produce a disassembly outcome that should be presented within a report, which will be used to inform further design of the ‘set product’..

CAD

Students must

- Use CAD software to produce an accurate virtual 3D model of the **device holder**.
- Use CAD software to produce individual components.
- Use the mate tools to create a CAD assembly using the individual components.
- Use CAD software to demonstrate the model from different viewpoints of the 'set product'.

Half Term 3 and 4

Physical Model Planning

Students must

- Create a detailed plan for manufacturing the prototype, set tasks, and identify the most important production considerations, including risk assessment.
- Demonstrate knowledge of the safe use of tools and equipment that will be required during the manufacture of the prototype **device holder**.

Physical model production

Students must

- Use your production plan to manufacture the 'set product'.
- Select and use appropriate tools and materials to produce the 'set product'.
- Record all the key stages of making the prototype.

Evaluation

Students must

- Compare the final prototype against the design specification.
- Consider ways that the prototype could be improved.

Unit R040 is internally assessed by the teachers, so that the assessment can be checked by the exam board

Half Term 5

Unit R038

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
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Half Term 6

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 Tasks 3 and 4: Production of Engineering drawings and CAD models.