



Practical Maths for Electrical Installation Students & Apprentices

Course Delivery Guide (Units 1–10)

How to Use This Guide

This handbook provides structured, ready-to-deliver lesson plans for each unit in the course.

Each unit is designed for a **3-hour teaching session**, suitable for FE colleges delivering Level 2 and Level 3 Electrical Installation programmes.

Each lesson follows a consistent structure to support:

- Strong engagement
- Clear explanation of concepts
- Practical application to electrical contexts
- Independent learner development

Standard 3-Hour Lesson Structure

Total Duration: 180 minutes

- **Starter & Recap – 20 mins**
- **Concept Delivery – 50 mins**
- **Guided Practice – 40 mins**
- **Independent Application – 50 mins**

- **Review & Assessment – 20 mins**
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Unit 1 – Basic Mathematical Operations

Lesson Duration

3 Hours

Learning Objective

Develop confidence and accuracy in addition, subtraction, multiplication, and division.

Lesson Breakdown

Starter (20 mins)

- Diagnostic questions covering basic operations
- Identify gaps in numeracy skills

Concept Delivery (50 mins)

- Order of operations (BODMAS)
- Mental maths strategies
- Written methods for accuracy

Guided Practice (40 mins)

- Tutor-led worked examples
- Scaffolded worksheet tasks

Independent Application (50 mins)

- Mixed calculation problems
- Electrical context: load calculations, totals

Review & Assessment (20 mins)

- Quick-fire questions
- Final check: $(10 + 5) \times 2$

- Address common mistakes
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Unit 2 – Fractions

Learning Objective

Understand, manipulate, and apply fractions in practical scenarios.

Lesson Breakdown

Starter (20 mins)

- Recap division and ratios

Concept Delivery (50 mins)

- Equivalent fractions
- Adding/subtracting fractions
- Multiplying/dividing fractions

Guided Practice (40 mins)

- Step-by-step examples
- Common denominator work

Independent Application (50 mins)

- Real-world tasks (e.g. splitting loads, cable lengths)

Review (20 mins)

- Final check: $\frac{1}{2} + \frac{1}{2}$
 - Common mistakes: denominator errors
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Unit 3 – Decimals

Learning Objective

Perform accurate decimal calculations and conversions.

Lesson Breakdown

- Starter: fraction \leftrightarrow decimal recap
 - Teaching: place value, rounding, operations
 - Guided: structured calculations
 - Independent: measurement-based tasks
 - Review: $0.6 + 0.35$
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Unit 4 – Percentages

Learning Objective

Apply percentages to practical calculations.

Lesson Breakdown

- Starter: decimal recap
 - Teaching: % of values, increases/decreases
 - Guided: step-by-step percentage problems
 - Independent: electrical scenarios (efficiency, losses)
 - Review: 25% of 80
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Unit 5 – Ratios

Learning Objective

Understand and apply ratios and proportion.

Lesson Breakdown

- Starter: fractions recap

- Teaching: simplifying ratios, dividing quantities
 - Guided: worked examples
 - Independent: material mixes, scaling problems
 - Review: *Divide 20 in ratio 1:3*
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Unit 6 – Powers (Indices)

Learning Objective

Understand and apply powers and indices.

Lesson Breakdown

- Starter: multiplication recap
 - Teaching: index laws
 - Guided: structured examples
 - Independent: calculation practice
 - Review: 2^3
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Unit 7 – SI Units

Learning Objective

Use standard units and prefixes correctly.

Lesson Breakdown

- Starter: unit awareness check
 - Teaching: base units, prefixes (kilo, milli, etc.)
 - Guided: conversions
 - Independent: electrical calculations (kW, A, V)
 - Review: *Convert 1 kW to W*
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Unit 8 – Algebra

Learning Objective

Solve basic algebraic expressions and equations.

Lesson Breakdown

- Starter: number operations recap
 - Teaching: forming and solving equations
 - Guided: step-by-step solving
 - Independent: electrical formula problems
 - Review: $x + 5 = 10$
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Unit 9 – Transposition of Formulae

Learning Objective

Rearrange formulas to make different variables the subject.

Lesson Breakdown

- Starter: algebra recap
 - Teaching: balancing equations
 - Guided: structured rearrangement
 - Independent: electrical formulas (Ohm's Law etc.)
 - Review: $y \div 2 = 4$
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Unit 10 – Trigonometry & Pythagoras

Learning Objective

Apply trigonometry and Pythagoras in practical scenarios.

Lesson Breakdown

- Starter: basic geometry recap

- Teaching: SOHCAHTOA, right-angled triangles
 - Guided: worked examples
 - Independent: installation scenarios (angles, distances)
 - Review: trig application question
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Delivery Notes for Lecturers

- Prioritise **application over theory**
- Continuously link maths to **real electrical tasks**
- Use **mini whiteboards / questioning** for engagement
- Reinforce through **repetition and variation**
- Address **common mistakes explicitly**