

# Practical Maths for Electrical Installation Students & Apprentices

## Unit 3: Decimals for Electrical Calculations

### Lesson Plan

**Duration: 3 Hours**

**Level: Level 2 / Level 3**

**Delivery Format: Classroom / Workshop Theory Session**

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### 1. Learning Objectives

By the end of this lesson, learners will be able to:

- Understand place value in decimal numbers
  - Perform calculations with decimals (add, subtract, multiply, divide)
  - Convert between **decimals, fractions, and percentages**
  - Apply decimal calculations to **electrical scenarios**
  - Identify and correct common mistakes when working with decimals
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### 2. Prior Knowledge / Entry Requirements

Learners should:

- Be confident with basic number skills (Unit 1)
  - Have an understanding of fractions (Unit 2)
  - Be able to use a calculator
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### 3. Resources Required

- PowerPoint slides – Unit 3
  - Student worksheets – Unit 3
  - Course handbook
  - Answer sheets
  - Calculators
  - Whiteboard / flipchart
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### 4. Lesson Structure (3 Hours Total)

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#### Starter Activity (15–20 minutes)

**Purpose:** Reinforce fractions and introduce decimals

**Activity:**

Write on the board:

1. Convert  $\frac{1}{2}$  to a decimal
  2. Convert  $\frac{3}{4}$  to a decimal
  3. Convert 0.25 to a percentage
  4. What is 0.5 of 60?
  5. Order: 0.3, 0.03, 0.33 (smallest to largest)
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**Delivery:**

- Learners attempt individually
- Review answers as a group
- Link fractions → decimals

**Key Focus:**

Understanding **place value** and decimal size

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#### Teaching Input – Core Concepts (65–75 minutes)

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### Topic 1: Decimal Place Value

- Tenths, hundredths, thousandths
- Reading and writing decimals

#### Example:

- 0.5 = five tenths
  - 0.05 = five hundredths
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### Topic 2: Decimal Calculations

- Addition and subtraction (align decimal points)
  - Multiplication
  - Division
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### Topic 3: Conversions

- Decimal → Fraction
  - Decimal → Percentage
  - Percentage → Decimal
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### Worked Example (Electrical Context)

A cable length is 12.5 metres.

Another section is 7.25 metres.

What is the total length?

#### Solution:

$$12.5 + 7.25 = 19.75 \text{ metres}$$

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### Common Mistakes to Highlight

- Misaligned decimal points
- Misreading place value (0.5 vs 0.05)
- Incorrect calculator use
- Rounding errors

## Break (10–15 minutes)

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## Guided Practice (50–60 minutes)

**Purpose:** Supported application

**Activity:**

Learners begin worksheet:

- Section A: Decimal place value
  - Section B: Calculations
  - Section C: Conversions
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**Tutor Role:**

- Circulate and support
  - Reinforce correct layout
  - Address misconceptions early
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**Focus Areas:**

- ✓ Align decimal points correctly
  - ✓ Show working clearly
  - ✓ Use correct units
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## Independent Practice (40–45 minutes)

**Purpose:** Build confidence and independence

**Activity:**

Learners complete remaining questions

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**Include Applied Questions:**

- A cable run is 15.75 m plus 8.5 m — find total length
  - A current reading is 0.25 A — convert to percentage of 1 A
  - Material cost: £12.50 + £7.75 + £3.20 — find total
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**Tutor Role:**

- Minimal input
  - Encourage independent thinking
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**Review & Feedback (25–30 minutes)**

**Purpose:** Consolidate learning

**Activity:**

- Go through key answers
  - Learners explain their methods
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**Focus Questions:**

- “Why must decimal points line up?”
  - “What happens if you don’t align them?”
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**Common Errors to Address:**

- Place value mistakes
  - Incorrect addition/subtraction
  - Calculator misuse
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**Plenary (10 minutes)****Quick Recap Questions:**

- What is 0.75 as a percentage?
  - Which is larger: 0.5 or 0.05?
  - Add:  $2.5 + 0.75$
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**Reflection:**

- What did you find challenging?
  - What do you feel confident with?
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**Link to Next Unit:**

“Next, we will apply decimals and percentages to more practical calculations.”

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**5. Assessment of Learning**

- Starter activity responses
  - Ongoing questioning
  - Worksheet completion
  - Learner explanations
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**6. Differentiation****Support:**

- Use place value grids
- Start with simple decimals
- Provide step-by-step guidance

**Stretch:**

- Multi-step calculations
  - Real-world electrical problems
  - Ask learners to explain concepts
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**7. English & Maths Integration**

- Use of correct terminology (tenths, hundredths)
  - Interpreting questions
  - Clear written working
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## 8. Behaviour & Engagement Strategy

- Regular questioning
  - Practical examples
  - Active participation
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## 9. Homework / Extension

- Complete worksheet
  - Additional decimal problems
  - Practice conversions
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## 10. Tutor Notes

### Common Learner Difficulties:

- Weak understanding of place value
  - Misalignment of decimals
  - Over-reliance on calculators
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### Key Teaching Emphasis:

- Place value is critical
  - Always align decimals
  - Encourage mental estimation
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### Pacing Advice:

- Spend longer on addition/subtraction if needed
- Use real-world examples for engagement