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| **Lesson Number: 25.4** | | |
| **Lesson Title: Alternating current and power** | | |
| **Specification Reference** | | **3.7.5.5** |
| **Learning Objectives** | | |
| Sinusoidal voltages and currents only; root mean square, peak and peak-to-peak values for sinusoidal waveforms only.    Application to the calculation of mains electricity peak and  peak-to-peak voltage values.  Use of an oscilloscope as a dc and ac voltmeter, to measure time intervals and frequencies, and to display ac waveforms.  No details of the structure of the instrument are required but familiarity with the operation of the controls is expected. | | |
| **Opportunities for Assessment** | | |
| Page 422 questions | | |
| **Starter:** | Slide #1 enables the recap and discussion of AC supply and also sine waves and the key words amplitude, frequency, peak, trough, time period | |
| **Main:** | Slides #1 - #3 go through the general AC supply units and measurements.  Slide #4 shows an oscilloscope  Slides #5 - #7 go through the use of an oscilloscope and test the pupil’s ability to use one to get meaningful data. – Note that if these were not used in the required practical or a student was off then write up this experiment and it can be used as technique (h)  Slides #8 and #9 explain the mathematical use of *root mean squared* calculations and applies them to AC potential difference and current – the calculation of 230V here often answers questions posed earlier about why we say the mains is 230V but it peaks at 325V | |
| **Plenary:** | Slide #10 is a summary | |

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| **Homework:** | Page 422 questions | |
| **Differentiation / Extension / S&C** | | |
| Development and history of the main electrical system; DC vs AC arguments for mains electricity | | |
| **Numeracy / Literacy** | | **SMSC / Fundamental British Values** |
| Root mean squared calculations  Reading from an oscilloscope | | Health and safety of AC electricity |
| **RESOURCES:** | | |
| Group sets of:   * Low voltage power supply (AC) * Connecting leads (for oscilloscope) * Oscilloscope | | |
| **Risk Assessment** e.g. CLEAPSS card reference | | |
| No dangers however use only 2V with oscilloscopes | | |
| **Working Scientifically (HSW)** | | |
| N/A | | |

Pictures courtesy of:

Slide #1 – Wikipedia