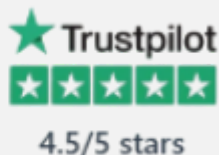


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At Connect2Learn, we believe brilliance isn't born – it's built. Our global learning platform is designed to empower every student with personalized, one-on-one education that nurtures skills, confidence, and curiosity. From core academics to creative and future-ready subjects, we connect passionate educators with young minds across the UK, Australia, and the US. With 5,000+ learners and a mission to reach 10,000 more, Connect2Learn is shaping a generation that's not just prepared for the future – but ready to lead it.



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MODULE -1 WHY DO MATERIALS HAVE DIFFERENT PROPERTIES?

PARTICLE EXPLANATIONS OF DENSITY AND PRESSURE

- Calculating density and measuring volume
- Measuring density
- Pressure in a fluid
- Upthrust calculations
- Explaining convection
- Explaining changes of pressure



ENERGY OF MOVING PARTICLES

- Thermal conduction and insulation
- Effective insulation
- Heating different substances
- Calculating specific heat capacity ($\Delta E = m c \Delta \theta$)
- Measuring specific heat capacity
- A heating curve for water
- Specific latent heat ($E = m L$)



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MODULE -2 HOW DO FORCES MAKE THINGS HAPPEN?

MEASURING AND CALCULATING MOTION

- Work done calculations ($W = F \times s$)
- Power calculations ($P = W/t$)
- Calculating efficiency (in terms of energy and power)
- Calculating the energy of moving objects ($E_k = 1/2 mv^2$)
- The energy of objects in a gravitational field ($E_p = mgh$)
- Calculating energy changes - with complex examples (E_k and E_p)
- Stretching a spring practical
- Stretching a spring analysis and calculations ($F = ke$)
- Calculating the energy of springs ($E_e = 1/2 ke^2$)



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ENERGY OF MOVING OBJECTS

- Work done calculations ($W = F \times s$)
- Power calculations ($P = W/t$)
- Calculating efficiency (in terms of energy and power)
- Calculating the energy of moving objects ($E_k = 1/2 mv^2$)
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MODULE -3 UNDERSTANDING MOTION, SPEED, AND SOUND"

MEASURING WAVES

- Transverse waves
- Representing transverse waves
- Representing longitudinal waves
- Oscilloscope
- Measuring the speed of water waves from distance and time
- The wave equation
- Using the wave speed equations
- Measuring waves in a ripple tank
- Measuring waves on a string
- Measuring the speed of sound in air and solids
- Human hearing
- Probing planet Earth



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MODULE -4 HOW DO ELECTRICITY AND MAGNETISM WORK?

CIRCUIT COMPONENTS

- Measuring the resistance of a filament lamp
- Resistance of a hot metal
- Measuring the resistance of a diode
- Interpreting I–V graphs
- Potential divider circuits
- LDRs and thermistors



ELECTRIC FIELDS AND CIRCUIT CALCULATIONS

- Electric fields
- Moving electric charge
- Linking current, potential difference and resistance
- Resistance of a wire at a constant temperature
- Analysing series circuits: including complex calculations
- Adding components to a parallel circuit
- Analysing parallel circuits: including complex calculations



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POTENTIAL DIFFERENCE, ENERGY AND POWER

- Concepts of electrical potential difference and power within a circuit
- Explain that the energy available to electric charges moving in an electrical circuit is measured using electrical potential difference
- Explain in qualitative terms why electric charge separation produces an electrical potential difference.
- Solve problems involving electrical potential difference using: $V = \frac{W}{q}$
- Vectors and Resultants





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