Meaningful Learning Experiences

Strategic Commitment	✓	**Part of a regional, ESF-funded 'Careers Local' programme**
Curriculum Provision	✓	**One of a series focusing on 'dry' Science topics**
Employer Partnerships	✓	**Developing a relationship with an existing school contact**
Reflective Young People		
Informed Career Choices	✓	**Raising awareness about roles in Engineering**

Eriks explains the value to Engineering of measurement skills learned in the Science lab

Tupton Hall School in Chesterfield asked the Science faculty to identify five curriculum topics that would provide a basis for staff development, showing how employers can bring 'dry' topics to life in the classroom. One of these involved a Physics practical in which year 9 students, '*Use circuit diagrams to set up an appropriate circuit to investigate a factor/the factors that affect the resistance of an electrical component. This should include (a). the length of a wire at constant temperature and (b). combinations of resistors in series and parallel*'.

International electrical engineering firm Eriks has a site in Chesterfield that services industrial electrical motors and power generators. A video message and set of PowerPoint slides featuring the Quality Manager explained how the company reconditions equipment using large copper wires and coils that require great precision in their assembly and measurement of performance. A sample was provided to the school for students to handle in the Physics laboratory.

A selection of the students' work was sent across to the quality manager who replied in a short video message with encouraging comments about the quality of their work and the value of careful measurement in Engineering, also referring to the firm's corporate success principles: Passion, Specialism and Innovation.

Benefits for the Students

- *'I have learned a lot more than I knew already in a fun way'*
- *'I am proud there were clear results that correlated with other groups'*
- *'I learnt about physics and school whilst also learning about working life and future options available to me'*
- *'I understand how motors are constructed and how they check the quality'*
- *'I learned about working as a group with other people so we could get the work done quicker'*

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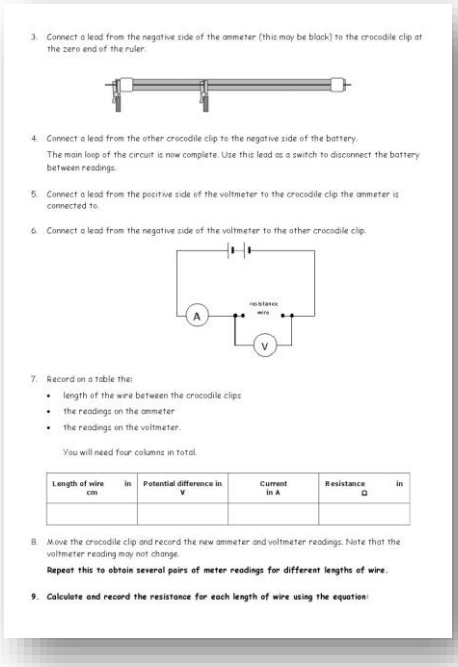
Benefits for the School

- All five Science projects involved topics that had been described as ‘dry’. The projects are exemplars for all teaching staff to see how classroom learning can be brought ‘to life’
- The Science team was having to cope with a period of staff absences, so this project avoided the need for special arrangements to manage out-of-school trips or guest visits
- The project involved timetabled lessons and subject learning, which complements the school’s other work with Eriks, including work experience for individual students

Benefits for the Employer

- Eriks has a strong commitment to Corporate Social Responsibility. The Quality Manager’s involvement contributed to this, without even leaving the workplace
- The Quality Manager was working as a STEM Ambassador, running STEM clubs for local primary school children. This allowed him to have an impact in a local secondary school
- Engineering is experiencing a skills shortage and is keen to promote the sector as an attractive career option. The project helped to support this objective



3. Connect a lead from the negative side of the ammeter (this may be black) to the crocodile clip at the zero end of the ruler.

4. Connect a lead from the other crocodile clip to the negative side of the battery.
The main loop of the circuit is now complete. Use this lead as a switch to disconnect the battery between readings.

5. Connect a lead from the positive side of the voltmeter to the crocodile clip the ammeter is connected to.

6. Connect a lead from the negative side of the voltmeter to the other crocodile clip.

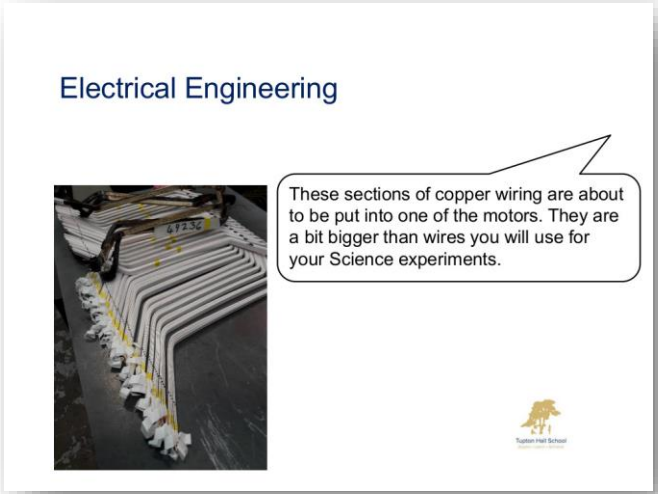
7. Record on a table the:
- length of the wire between the crocodile clips
- the readings on the ammeter
- the readings on the voltmeter.

You will need four columns in total.

Length of wire in cm	Potential difference in V	Current in A	Resistance in Ω

8. Move the crocodile clip and record the new ammeter and voltmeter readings. Note that the voltmeter reading may not change.
Repeat this to obtain several pairs of meter readings for different lengths of wire.

9. **Calculate and record the resistance for each length of wire using the equation:**



Year 9 students are required to complete a lab experiment to test resistivity of different lengths and thicknesses of copper wire. The Quality Manager at local electrical engineering firm Eriks illustrated how ‘wire’ is used in large motors and generators they maintain and why great care is needed when taking measurements.

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