

Year 9: Physical World- Electricity

	Check	Date
ASSUMED KNOWLEDGE STAGE 4 OUTCOMES SC4-10PW describes the action of unbalanced forces in everyday situations SC4-11PW discusses how scientific understanding and technological developments have contributed to finding solutions to problems involving energy transfers and transformations	<input type="checkbox"/>	
Literacy: A.L.A.R.M; Remember I.D.E.A and stop at the verb provided		
Identify: Name and Define Describe: Differentiate and distinguish by providing characteristics, features and properties Explain: Cause and effect = LINK purpose or function of EACH feature or characteristic listed above (Use linking words such as: As a result., This leads to .., This provides .., As a consequence., Therefore., Thus ..)		
Analyse/Evaluate: Positive and negative arguments and finish with clear personal point of view		
PW3 Scientific understanding of current electricity has resulted in technological developments designed to improve the efficiency in generation and use of electricity.		
ELECTRICITY ENERGY AND EFFICIENCY		
5PW3a. describe voltage, current and resistance in terms of energy applied, carried and dissipated		
Recall the Law of conservation of energy	<input type="checkbox"/>	
Define voltage, current and resistance (Oxford pg253)	<input type="checkbox"/>	
Identify the symbols for voltage, current and resistance	<input type="checkbox"/>	
Describe voltage, current and resistance in terms of energy applied, carried and dissipated (Oxford pg253)	<input type="checkbox"/>	
The analogy used is: Water pump and electrical circuits Resistance can be compared to a water wheel, Pressure to voltage and flow rate of water to Current.	<input type="checkbox"/>	
Identify the three components of a simple electrical circuit	<input type="checkbox"/>	
Identify the correct devices for measuring current and voltage	<input type="checkbox"/>	
Identify basic circuit components and symbols	<input type="checkbox"/>	
CODE: 9PW1 First-Hand investigation: Simple circuits- Morse code Students construct a circuit containing a globe and switch and communicate a message to their peers via the circuit	<input type="checkbox"/>	
5PW3b. describe qualitatively the relationship between voltage, resistance and current		
Describe the relationship between voltage, resistance and current (Ohm's Law).	<input type="checkbox"/>	
CODE: 9PW2 First-Hand investigation: Investigating Ohms law (Oxford pg256). Extension- Discuss the theorised and actual result for resistance.	<input type="checkbox"/>	
Numeracy: Solve a range of problems requiring Ohm's Law $V = IR$	<input type="checkbox"/>	
Numeracy: Understanding resistor colour codes (Oxford pg254)	<input type="checkbox"/>	

Extension- 5PWadd8: Explain the relationship between resistance, voltage and current, using Ohm's Law	<input type="checkbox"/>	
<i>5PW3c. compare the characteristics and applications of series and parallel electrical circuits</i>		
Distinguish between series and parallel electrical circuits	<input type="checkbox"/>	
Draw a range of simple series and parallel electrical circuits	<input type="checkbox"/>	
CODE: 9PW3 First-Hand investigation: Series v's Parallel electrical circuits Construct a range of series and parallel circuits. Explore the effect of voltage on current and resistance in each.	<input type="checkbox"/>	
Compare applications of series and parallel circuits. <ul style="list-style-type: none"> Series – Batteries in a torch, Some Christmas lights Parallel – Christmas lights and Electrical circuits at home 	<input type="checkbox"/>	
<i>5PW3d. outline recent examples where scientific or technological developments have involved specialist teams from different branches of science, engineering and technology, eg low-emissions electricity generation and reduction in atmospheric pollution</i>		
Research task: Describe current Australian initiatives to lower greenhouse emissions and reduce dependence on non-renewable energy sources: (Oxford pg259) <ul style="list-style-type: none"> replace incandescent light bulbs with compact fluorescent lamps treating coal and coal emissions turning coal into gas (Syngas) carbon capture and storage low-emissions cars and reduction in atmospheric pollution Outline the specialist teams from different branches of science, engineering and technology that were involved in these scientific or technological developments 	<input type="checkbox"/>	
Literacy activity: COSMOS. Rethinking the World's Energy by Wilson da Silva: Issue 44 pg56 OR Research and find an article related to the topic. Students then write a series of questions that MUST include 5 multiple choice, 2 identify, 2 describe, 1 explain and either 1 assess or evaluate.	<input type="checkbox"/>	
<i>PW4 Energy conservation in a system can be explained by describing energy transfers and transformations. (ACSSU190)</i>		
<i>5PW4a. apply the law of conservation of energy to account for the total energy involved in energy transfers and transformations</i>		
<i>5PW4b. describe how, in energy transfers and transformations, a variety of processes can occur so that usable energy is reduced and the system is not 100% efficient</i>		
Define energy efficiency	<input type="checkbox"/>	
Recall the Law of conservation of energy	<input type="checkbox"/>	
Describe how, in energy transfers and transformations, a variety of processes can occur so that usable energy is reduced and the system is not 100% efficient. <ul style="list-style-type: none"> Lost energy in electric circuit (hot light globe) Energy transformation involved with driving a car Heating of body when exercising Energy pyramid in ecosystems Rollercoaster, Skateboarder 	<input type="checkbox"/>	

PhET- Interactive simulations: Skateboarder http://phet.colorado.edu/	<input type="checkbox"/>	
Extension- 5PWadd9 Research task: Investigate the energy efficiency of appliances and relate this to a household energy account (Oxford pg259)	<input type="checkbox"/>	
5PW4c. discuss, using examples, how the values and needs of contemporary society can influence the focus of scientific research in the area of increasing efficiency of the use of electricity by individuals and society (ACSHE228, ACSHE230)		
5PW4d. discuss viewpoints and choices that need to be considered in making decisions about the use of non-renewable energy resources		
Relate global warming, the risk of running out of fossil fuels to the development of technologies and infrastructure that are energy efficient.	<input type="checkbox"/>	
Research task: Research new developments in local area that are energy efficient e.g. <ul style="list-style-type: none"> • UTS sustainable building (http://www.uts.edu.au/partners-and-community/initiatives/uts-green/campus-operations/sustainable-buildings) • Rouse Hill shopping centre (http://www.rhtc.com.au/connecting-communities) • Blacktown library (http://www.blacktown.nsw.gov.au/Environment/Plans_Policies_Reports/Environmental_Sustainability_Framework) 	<input type="checkbox"/>	
Class discussion/debate: Coal power versus Wind or solar energy Students play the roles of environmentalists, businessmen, politicians and every day citizens. They argue their point of view and try to come to a compromise regarding the issue. (Use Oxford pg261-262 to inform debate)	<input type="checkbox"/>	
Extension- 5PWadd10 Research task: Research how engineers and architects employ scientific concepts and principles in designing energy-efficient devices and buildings	<input type="checkbox"/>	
Assessment: Energy and Electricity checkpoint test	<input type="checkbox"/>	
Assessment: Oxford online test- Energy and Electricity Students to achieve 100% in Support and Consolidate OR Consolidate and Extend	<input type="checkbox"/>	
Comments and Suggested improvements		
<p>Name: _____ Signature: _____ Date: _____</p>		