# Year 9 – Physical Science

# Student Program 2017

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| **Week** | **Program** | **Pearson 9 Activity book**  **Pearson 9 Student book**  **Rossmoyne Booklet** |
| **Wk 9** | **Static Electricity**   * Structure of the atom: protons, neutrons and electrons * Static electricity is due to an object having an unequal number of electrons to protons. * Static electricity is created by friction where there has been a transfer of electrons between two different materials. * The charge law: like charges repel, unlike charges attract * Induced charge: A neutral object can be attracted to a charged object * Applications; Lightning, electrostatic precipitators, feather dusters, | SB p184 *AB Year 7 7.8 Static Electricity p103-104*  RB Elec. Activity 1: Static Electricity p4-5  RB Elec. Activity 2: Charge p6  RB Elec. Activity 3: Charge meets charge p7  RB Elec. Activity 4: Atoms and Electrons p8 |
| **Wk 10** | **Electrical Circuits**   * Simple circuits: consist of a power source (voltage), current (conductors) and resistance (a device to convert the electrical energy into other forms) * AC/DC * Simple circuit diagrams and symbols * Construct simple series and parallel circuits from circuit diagrams and vice versa. * Advantages and disadvantages of series and parallel circuits. * Use a torch as an example of a simple series circuit. | SB p184-185SB 6.1 Unit Review p186 RB Elec. Activity 5: Conductors and Insulators p9-11  RB Elec. Activity 6: How does an electric torch work: p12 AB 6.1 Analogies p67-68 SB p199-201  RB Elec. Activity 7: Electrical Circuits p13  RB Elec. Activity 8: Series Circuits p14  RB Elec. Activity 9: Parallel Connections p15  RB Elec. Activity 10: A review of circuits p16  AB 6.2 Reading Meters p69 |
| **Term 2**  **Wk 1** | **Current Electricity**   * Current is the flow of charge through a conductor Unit = Amperes (A) * Voltage is the potential for the charge to flow (the source of the energy) Units = volts (V) * Resistance is the resistance to the flow of current. Units = Ohms (Ω) * Ohm’s Law V=IR calculations * Ohmic and non-ohmic resistors | SB p190-194SB 6.2 Unit Review p195-196 RB Elec. Activity 16: Voltage, Resistance and Current p26  RB Elec. Activity 17: Measuring voltage p27-28  RB Elec. Activity 18: Resistance and Current p29  RB Elec. Activity 19: Voltage and Current p30  RB Elec. Activity 20: Using Ohm’s Law p31-32 |
| **Wk 1** | **Electrical Circuits Investigation** | AB 6.3 Ohm’s Law p70-72 AB 6.4 Plotting Ohm’s Law p73  AB 6.5 Predicting Current and Voltage p74 |
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| **Wk 2 - 3** | **Making and Using Electricity**  **Electrical Safety**   * Short circuits, fuses and electrical safety. * Applications: circuits in the home, batteries, voltmeters and ammeters   **Electrical Safety Assignment** | RB Elec. Activity 11:Sources of electricity p18  RB Elec. Activity 12: The chemical cell p19  RB Elec. Activity 13: The dry cell p20  RB Elec. Activity 14: Making a Storage battery p21  RB Elec. Activity 15:Making electricity p22-25 PS 191-192 SB p201-203  SB 6.3 Unit Review p204-205  Chapter 6 Review p220 Chapter 6 Thinking Scientifically p221 AB 6.6 Keeping Safe p75-76  AB 6.7 Media Analysis p77-78  RB Elec. Activity 26:Electrical Safety p41  RB Elec. Activity 27: Earth wires p42  RB Elec. Activity 28: Safety with electricity p43  AB 6.9 Literacy Review p81 |
| **Wk 4** | **Sound Waves**   * Waves transfer energy without a transfer of matter. * Parts of a wave: wavelength, amplitude and frequency, period * Types of waves: transverse, longitudinal * Sound is a longitudinal wave that requires a medium of transfer (space is a vacuum through which sound cannot travel) * Sound is created by a vibrating source that creates compressions and rarefactions * Speed of sound is 340 ms-1 in air but varies in different materials. Sound travels fastest in solids and slowest in gases. * Pitch is related to frequency. * Amplitude is related to loudness. * Generators. - EXTRA * DC Motors   **ELECTRICITY TOPIC TEST** | RB Elec. Activity 22: Cup Speaker p36  RB Elec. Activity 23: Make a mobile phone p38  RB Elec. Activity 24: Pitch and Sound p39  RB Elec. Activity 25: Changing the pitch p40  Oxford Science 4.1, 4.2  Pages 70 -73  OPTIONAL  AB 6.8 Comparing methods of  power generation p79-80  SB p208-214  SB 6.4 Unit Review p217 |
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| **Wk 5** | **Energy and Work**   * Energy as the ability to do work. * The unit of measurement for energy is the Joule (J) * Work is the physical effects of energy. * Different forms of energy: kinetic, light, sound, electrical, potential, elastic, chemical, gravitational, nuclear.   **Kinetic Theory of matter** (The Particle theory of matter).   * Assumptions:   1. All matter is made up of particles  2. The particles are constantly moving  3. The particles are attracted to each other when they get close enough  4. The particles have elastic collisions   * Relate the kinetic theory of matter to heating and cooling | SB p99-100  RB Heat Activity 1: Investigating Energy p6-7  RB Heat Activity 2: Forms of Energy p8  RB Heat Activity 3: Sources and Receivers p9-10  RB Heat Activity 6: Measuring energy p14-16  RB Heat Activity 5: The Kinetic theory of matter and change of state p12-13 |
| **Wk 6** | **Heat**   * Heat is the transfer of energy (conduction, convection and radiation). * Internal or thermal energy is the total energy (Ek&Ep) of the particles in a substance. * Ek relates to particle movement, Ep is the average distance between particles. * Temperature is the measure of the average kinetic energy of the particles in an object * The unit for temperature = o Celsius * Heat can be transferred between objects by the processes of convection, conduction and radiation. * Objects with a higher temperature will transfer heat to lower temperature objects.   **Methods of Energy Transfer (heat)**  **Conduction**   * Heat transfer by direct collision of particles * Transfer is not uniform across different materials * Insulating materials * Occurs mainly in solids * Applications of conductors and insulators eg esky, thermos, frying pans and bbq plates | RB Heat Activity 4: Heat is energy p11  RB Heat Activity 7: Heat transfer p17-18  RB Heat Activity 17: Heat and temperature p36-37  RB Heat Activity 18: How does a thermometer work? p38  RB Heat Activity 19: Calibrating your thermometer p39  RB Heat Activity 20: Assignment Thermometers p40 AB 4.1 Testing insulators p38-39SB p102-104AB 4.2 Cool cars p40-41 RB Heat Activity 10: Comparing conductivity p25 |
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| **Wk 7 - 8** | **Convection**   * Is the transfer of heat by movement of the particles. * Occurs in fluids (gas and liquid) * Convection currents * Applications; Ocean currents, sea breezes, air thermals, solar hot water systems.   **Radiation**   * Heat transfer by radiation is by infrared rays. * The infrared radiation is not hot until it is absorbed by an object which converts it to increased Ek of particles. * Does not involve a transfer of matter * Different coloured and textured objects will absorb infrared radiation at different rates * The sun is the source of the Earth’s heat by radiation. * Applications, Solar hot water, solar cooking, greenhouses, colour of cars and clothes * **Energy Efficient Houses Assignment** | RB Heat Activity 11: Explanation of heat transfer using the kinetic theory of matter p26  RB Heat Activity 12: Car heat risk to children p27  RB Heat Activity 21: Heating solids p41-43  SB p105  SB Unit 4.1 Review p106  RB Heat Activity 8: What is radiant energy p19-21  RB Heat Activity 9: A model hot water system p22-24  RB Heat Activity 13: Reflecting and Absorbing Heat p28-29  RB Heat Activity 14: Insulating against heat loss p30-31  RB Heat Activity 15: Heat transfer in the home p32-33  RB Heat Activity 16: How effective is double glazing p34-35  AB 9.8 Literacy review 131  SB Chapter 1 Glossary p38 SB p111-117SB 4.2 Unit Review p120-121 SB p148-149 |
| **HEAT TOPIC TEST** | | |

**Assessment Structure**

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| **Assessment** | **When** | **Yearly Weighting (%)** |
| Electrical Circuits Investigation | Monday 20th Feb 2017 | 5 |
| Electrical Safety Assignment | Monday 27th Feb 2017 | 3 |
| Electricity Topic Test | Friday 10 th March 2017 | 7 |
| Energy Efficient Houses Assignment |  | 3 |
| Heat Topic Test |  | 7 |