# 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 p4-5RB Elec. Activity 2: Charge p6RB Elec. Activity 3: Charge meets charge p7RB 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 p186RB Elec. Activity 5: Conductors and Insulators p9-11RB Elec. Activity 6: How does an electric torch work: p12AB 6.1 Analogies p67-68SB p199-201RB Elec. Activity 7: Electrical Circuits p13RB Elec. Activity 8: Series Circuits p14RB Elec. Activity 9: Parallel Connections p15RB Elec. Activity 10: A review of circuits p16AB 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 p195-196RB Elec. Activity 16: Voltage, Resistance and Current p26RB Elec. Activity 17: Measuring voltage p27-28RB Elec. Activity 18: Resistance and Current p29RB Elec. Activity 19: Voltage and Current p30RB Elec. Activity 20: Using Ohm’s Law p31-32 |
| **Wk 1** | **Electrical Circuits Investigation** | AB 6.3 Ohm’s Law p70-72AB 6.4 Plotting Ohm’s Law p73AB 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 p18RB Elec. Activity 12: The chemical cell p19RB Elec. Activity 13: The dry cell p20RB Elec. Activity 14: Making a Storage battery p21RB Elec. Activity 15:Making electricity p22-25 PS 191-192SB p201-203SB 6.3 Unit Review p204-205Chapter 6 Review p220Chapter 6 Thinking Scientifically p221AB 6.6 Keeping Safe p75-76AB 6.7 Media Analysis p77-78RB Elec. Activity 26:Electrical Safety p41RB Elec. Activity 27: Earth wires p42RB Elec. Activity 28: Safety with electricity p43AB 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 p36RB Elec. Activity 23: Make a mobile phone p38RB Elec. Activity 24: Pitch and Sound p39RB Elec. Activity 25: Changing the pitch p40Oxford Science 4.1, 4.2Pages 70 -73OPTIONALAB 6.8 Comparing methods ofpower generation p79-80SB p208-214SB 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 particles2. The particles are constantly moving3. The particles are attracted to each other when they get close enough4. The particles have elastic collisions* Relate the kinetic theory of matter to heating and cooling
 | SB p99-100RB Heat Activity 1: Investigating Energy p6-7RB Heat Activity 2: Forms of Energy p8RB Heat Activity 3: Sources and Receivers p9-10RB Heat Activity 6: Measuring energy p14-16RB 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 p11RB Heat Activity 7: Heat transfer p17-18RB Heat Activity 17: Heat and temperature p36-37RB Heat Activity 18: How does a thermometer work? p38RB Heat Activity 19: Calibrating your thermometer p39RB Heat Activity 20: Assignment Thermometers p40AB 4.1 Testing insulators p38-39SB p102-104AB 4.2 Cool cars p40-41RB 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 p26RB Heat Activity 12: Car heat risk to children p27RB Heat Activity 21: Heating solids p41-43SB p105SB Unit 4.1 Review p106RB Heat Activity 8: What is radiant energy p19-21RB Heat Activity 9: A model hot water system p22-24RB Heat Activity 13: Reflecting and Absorbing Heat p28-29RB Heat Activity 14: Insulating against heat loss p30-31RB Heat Activity 15: Heat transfer in the home p32-33RB Heat Activity 16: How effective is double glazing p34-35AB 9.8 Literacy review 131SB Chapter 1 Glossary p38SB p111-117SB 4.2 Unit Review p120-121SB 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 |