

## Science Paper 1 RAG Rating – Separate Sciences (Triple) – HIGHER TIER

Codes refer to Kerboodle Science for Trilogy

Biology	Chemistry	Physics
<p><b>B1 – Cell Structure and Transport</b></p> <ul style="list-style-type: none"> <li>• Microscopes and magnification</li> <li>• Animal, plant and bacterial cells</li> <li>• Specialised eukaryotic cells</li> <li>• Diffusion, osmosis and active transport</li> </ul> <p><b>B2 – Cell Division</b></p> <ul style="list-style-type: none"> <li>• Mitosis and growth</li> <li>• Stem cells and their use</li> </ul> <p><b>B3 – Organisation and the Digestive System</b></p> <ul style="list-style-type: none"> <li>• Tissues and organs</li> <li>• The digestive system and food tests</li> <li>• Enzymes and factors that affect their activity</li> </ul> <p><b>B4 – Organising Animals and Plants</b></p> <ul style="list-style-type: none"> <li>• Blood and blood vessels</li> <li>• Structure of the heart, valve replacement and artificial hearts</li> <li>• Breathing and gas exchange</li> <li>• Plant tissues, transport and transpiration in plants</li> </ul> <p><b>B5 – Communicable Diseases</b></p> <ul style="list-style-type: none"> <li>• Health, disease and pathogens; defences of the body</li> <li>• <i>Growing bacteria a lab (aseptic technique)</i></li> <li>• Examples of viral/bacterial/fungal diseases in animals/plants</li> <li>• <i>Plant diseases and defences</i></li> </ul> <p><b>B6 – Preventing and Treating Disease</b></p> <ul style="list-style-type: none"> <li>• Vaccination; antibiotics; painkillers</li> <li>• Discovering new drugs and drugs trials</li> <li>• <i>Making and using monoclonal antibodies</i></li> </ul> <p><b>B7 – Non-Communicable Diseases</b></p> <ul style="list-style-type: none"> <li>• Cancer</li> <li>• Risks of smoking, poor diet, lack of exercise and alcohol</li> </ul> <p><b>B8 – Photosynthesis</b></p> <ul style="list-style-type: none"> <li>• Photosynthesis equation and how it works in plants</li> <li>• Experiments to show photosynthesis or its rate</li> <li>• Effects of CO<sub>2</sub>, temperature and light intensity on rate</li> <li>• How plants use glucose</li> </ul> <p><b>B9 – Respiration</b></p> <ul style="list-style-type: none"> <li>• Aerobic respiration</li> <li>• Effects of exercise</li> <li>• Anaerobic respiration</li> <li>• Role of the liver and metabolism</li> </ul>	<p><b>C1 – Atomic Structure</b></p> <ul style="list-style-type: none"> <li>• Atoms and ions</li> <li>• Sub-atomic particles, electron configuration, isotopes</li> <li>• Separating mixtures, including simple fractional distillation and paper chromatography</li> <li>• History of the development of the atomic model</li> </ul> <p><b>C2 – The Periodic Table</b></p> <ul style="list-style-type: none"> <li>• History of the development of the Periodic Table</li> <li>• Chemical and physical properties of Groups 1 (Alkali Metals) and 7 (Halogens)</li> <li>• Trends in the Periodic Table</li> <li>• <i>Transition metals</i></li> </ul> <p><b>C3 – Structure and Bonding</b></p> <ul style="list-style-type: none"> <li>• Particles and states of matter</li> <li>• Ionic substances and ionic bonding</li> <li>• Covalent substances and covalent bonding</li> <li>• Simple and giant covalent structures</li> <li>• Forms of carbon</li> <li>• Metals, alloys and metallic bonding</li> <li>• <i>Nanoparticles and their applications</i></li> </ul> <p><b>C4 – Chemical Calculations</b></p> <ul style="list-style-type: none"> <li>• Calculating relative formula masses, reacting masses and moles</li> <li>• Using masses to balance equations</li> <li>• <i>Yield and atom economy</i></li> <li>• Expressing concentration of solutions</li> <li>• <i>Titrations and calculations</i></li> <li>• <i>Volume of gases</i></li> </ul> <p><b>C5 – Chemical Changes</b></p> <ul style="list-style-type: none"> <li>• Reactivity series</li> <li>• Displacement reactions</li> <li>• Ionic equations; half equations</li> <li>• Reactions of metals with oxygen, water, acids</li> <li>• Reactions of soluble and insoluble bases with acids</li> <li>• pH scale and indicators</li> <li>• Strong and weak acids</li> </ul> <p><b>C6 – Electrolysis</b></p> <ul style="list-style-type: none"> <li>• Electrolysis of molten ionic compounds or aqueous solutions</li> <li>• Prediction of products at each electrode</li> <li>• Extraction of aluminium</li> </ul> <p><b>C7 – Energy Changes</b></p> <ul style="list-style-type: none"> <li>• Describing exothermic and endothermic reactions</li> <li>• Uses of exo and endothermic reactions</li> <li>• Reaction profile diagrams</li> <li>• Bond energy calculations</li> <li>• <i>Cells, batteries and fuel cells</i></li> </ul>	<p><b>P1 – Conservation and Dissipation of Energy</b></p> <ul style="list-style-type: none"> <li>• Energy stores and transfers; conservation of energy</li> <li>• Energy transfer and work done</li> <li>• Calculations of gravitational potential energy changes, kinetic and elastic energy</li> </ul> <p><b>P2 – Energy Transfer by Heating</b></p> <ul style="list-style-type: none"> <li>• Energy transfer by conduction</li> <li>• <i>Infrared radiation</i></li> <li>• Specific heat capacity</li> <li>• Heating and insulating buildings</li> </ul> <p><b>P3 – Energy Resources</b></p> <ul style="list-style-type: none"> <li>• Demand and supply of energy</li> <li>• Non-renewable energy sources (fossil fuel and nuclear power stations)</li> <li>• Renewable energy sources and electricity generation</li> <li>• Energy generation and the environment</li> </ul> <p><b>P4 – Electric Circuits</b></p> <ul style="list-style-type: none"> <li>• Static electricity</li> <li>• Current and charge</li> <li>• Potential difference and resistance</li> <li>• Components</li> <li>• Series and parallel circuits</li> </ul> <p><b>P5 – Electricity in the Home</b></p> <ul style="list-style-type: none"> <li>• Direct and alternating current</li> <li>• Cables and plugs</li> <li>• Electrical power</li> <li>• Appliances and efficiency</li> </ul> <p><b>P6 – Molecules and Matter</b></p> <ul style="list-style-type: none"> <li>• Density</li> <li>• Describing arrangement and behaviour of particles in solids/liquids/gas</li> <li>• Changes of state</li> <li>• Internal energy</li> <li>• Specific latent heat</li> <li>• Gas pressure and temperature</li> <li>• <i>Gas pressure and volume</i></li> </ul> <p><b>P7 – Radioactivity</b></p> <ul style="list-style-type: none"> <li>• Atoms and radiation</li> <li>• Discovery of the nucleus</li> <li>• Alpha, beta and gamma radiation – different characteristics, hazards and uses</li> <li>• Activity and half-life</li> <li>• <i>Nuclear radiation in medicine</i></li> <li>• <i>Nuclear fission and nuclear fusion</i></li> <li>• <i>Background radiation; risks &amp; safety; nuclear waste</i></li> </ul>

