

PGCE Science Initial Subject Audit

For any further queries about this Subject Audit below please e-mail the Biology Subject Tutor Steve.Abrams@roehampton.ac.uk or the Chemistry & Physics Subject Tutor Beverley.Ballie@roehampton.ac.uk.

Candidate's name:

You will meet this form again early in the PGCE course as we start to develop your subject knowledge. Prior to your interview we would like you to complete this form and bring it with you to your interview so that we can discuss your subject knowledge with you.

Topic	At what level and where did you study this topic	Tick if additional work required
BIOLOGY		
Using a light microscope to observe cells <i>and the role played by the electron microscope</i>		
Cell structures in both animal and plant cells		
Role of diffusion, <i>osmosis and active transport</i> in cell biology		
Hierarchical organisation of multicellular organisms		
Biomechanics and muscle structure and function		
Skelton and functions of bone		
Balanced diet and consequences of poor diet		
Tissues, organs and function of the human digestive system		
Enzymes as biological catalysts <i>Understand the kinetics and rate calculations of enzyme reactions</i>		
Plant nutrition		
Photosynthesis – to include its role in atmosphere composition and adaptations in plants to facilitate it. <i>Understand the role of limiting factors in determining the rate of photosynthesis and the process of transpiration.</i>		

Human reproduction (including reproductive systems, <i>hormonal control of the menstrual cycle</i> , gametes, fertilisation, gestation & birth)		
Plant reproduction (including pollination, fertilisation, dispersal and germination). <i>Plant structure including xylem and phloem. Understanding of plant hormones</i>		
Effects of recreational drugs		
Aerobic and anaerobic respiration in multi-cellular organisms		
Fermentation in micro-organisms		
Interdependence of organisms in ecosystems, <i>the importance of biodiversity and biological factors affecting food security.</i>		
Importance of insect pollination to food security		
The work of Watson, Crick, Wilkins and Franklin on DNA structure. <i>The role played by DNA in protein synthesis.</i>		
Simple heredity <i>including mitosis and meiosis, the work of Mendel, genetic disorders and the Human Genome Project</i>		
The significance of differences between species and within species		
The work of Darwin <i>and Wallace</i> and natural selection, <i>including and understanding of human evolution</i>		
The significance of biodiversity and <i>how our understanding of genetics has led to the suggestions of three domains rather than the five kingdoms</i>		
<i>Demonstrate an understanding of the relationships between quantitative units in relation to cells, including milli (10^{-3}), micro(10^{-4}), nano (10^{-5}) and pico(10^{-6})</i>		
<i>Explain structure and function of nervous system including reflex arc. and the eye</i>		
<i>An understanding of the basics of genetic engineering and the role played by GM organisms</i>		
<i>To understand the principles of health, disease (in humans and plants) and the development of medicines</i>		
<i>Describe the production and use of monoclonal antibodies.</i>		
<i>Have a good understanding of</i>		

<i>animal coordination, control and homeostasis including the principal human hormones.</i>		
<i>The water, carbon, nitrogen cycles.</i>		

CHEMISTRY		
Explanations of changes in states of matter using the particle model		
The Dalton atomic model		
Chemical symbols and formulae for elements and compounds <i>Transition metals and alloys</i>		
Techniques for separating mixtures. <i>Methods of purification</i>		
Representing chemical reactions using formulae and equations <i>Overarching concepts of chemistry types of Bonding</i>		
Combustion, thermal decomposition, oxidation & displacement reactions <i>Dynamic Equilibria and calculations involving gases</i>		
Chemistry of acids and alkalis including the properties of metal and non-metal oxides <i>Quantitative Analysis :tests for ions</i>		
Catalysts <i>Rates of Reaction.</i>		
Energetics in chemical reactions <i>Heat energy changes /Fuels</i>		
The development of use of the Mendeleev Periodic Table <i>Groups 1,7,0</i>		
The order and implications of metals and carbon in the reactivity series		
ceramics, polymers and composites (qualitative) <i>Hydrocarbons, Alcohols and Carboxylic acid</i>		
The composition and structure of the Earth and its atmosphere Atmospheric Science		
The carbon cycle <i>Surface properties of matter including Nanoparticles</i>		

PHYSICS		
Calculation of fuel uses and costs in the domestic context		
Fuels and energy resources <i>Conservation of Energy</i>		
Energy changes and transfers in simple machines		
Heating and thermal equilibrium		
Energy changes within a system		
Quantitative relationship between speed, distance and time		
Interaction of and representation of forces between objects		
Moments		
Measuring forces <i>Forces and Matter</i>		
Hooke's Law		
Work done and energy changes		
Non-contact forces		
Pressure in fluids		
Newton's laws of motion		
Transverse waves Sound		
<i>Electromagnetic Induction</i>		
Ultrasound		
Light waves travelling through a vacuum <i>Light and the EM Spectrum</i>		
Reflection and refraction of light: The Human Eye: Coloured Light		
<i>Magnetism and the motor effect</i>		
<i>Particle Model- 1.The Kinetic theory model</i>		
Current electricity and simple circuits		
The definition and measurement of current, potential difference and resistance and the relationship between them.		
Static electricity		
<i>Particle Model-2 Explaining the Gas Laws</i>		

DC motors		
Melting, freezing, evaporation, sublimation, condensation, dissolving		
Brownian motion		
Gravity, weight and mass		
Energy in matter		
Seasons Structures in the universe <i>Astronomy</i>		
<i>Radioactivity</i> <i>Types, Uses Dangers</i>		