Richard Lander School

Science Curriculum Overview - 10/11

BE THE BEST YOU CAN BE

Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2		
Reporting Y10		CfCs / BfL & Grades		CfCs / BfL & Grades		BfL & Report		
Year 10 Science teacher 1 (7 split)	C3 - Structure and Bonding. This unit covers ionic, covalent and metallic bonding. Students will also research the different allotropes of carbon. Assessment - C3 end of unit test and feedback.	B1 & B2 Cell Structure and Division. Students will investigate cells under a microscope and the movement of substances in and out of a cell. The module will then move onto cell division and stem cell ethics. Required Practical 1: Using a light microscope. Required Practical 2: Investigate the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue. Assessment - B1&2 end of unit test and feedback.	C4 & C5 - Chemical calculations and changes. Students will develop the skills required to calculate formula masses, moles (HT only) and concentration. The module will then move onto applying the reactivity series to displacement reactions. Required Practical 8: Prepare a salt from an insoluble metal carbonate or oxide. Assessment - C4 & 5 end of unit test and feedback.	B3 & B4 Organisation of animals and plants. This unit investigates animal organisation in terms of the digestive system, enzymes and the heart. The unit them moves onto plant organisation by investigating transpiration in plants. Required Practical 4: Investigate the effect of pH on the rate of reaction of amylase enzyme. Assessment - B3&4 end of unit test and feedback.	C6 & C7 - Electrolysis and Energy Change. Students will be able to predict products from liquid or aqueous electrolytes. They will then investigate exothermic and endothermic reactions and be able to interpret reaction profiles. Required Practical 9: Investigate the electrolysis of a solution. Required Practical 10: Investigating temperature changes in reacting solutions. Assessment - C6&7 end of unit test and feedback.	B8 & B9 - Photosynthesis and Respiration. Students investigate the factors that effect the rate of photosynthesis. The module moves onto aerobic respiration and exercise, then anaerobic respiration in animals and other organisms. Required Practical 5: Investigate the effect of light intensity on the rate of photosynthesis. Assessment - B8&9 end of unit test and feedback.		
Year 10 science teacher 2 (3 split)	P6 & P7 - Molecules, Matter and Radioactivity. This module covers energy in terms of changes of state and latent heat. Students compare alpha, beta and gamma radiation and predict half life from a graph. Required Practical 17: Calculating densities. Assessment - P6&7 end of unit test and feedback.	P1 & P2 - Energy: Conservation, Dissipation and transfer. Students calculate energy changes and efficiency as well as investigating heating and insulating buildings. Required Practical 14: Determining specific heat capacity. Assessment - P1 & 2 end of unit test and feedback.	P4 & P5 Electricity: Circuits and the Home. Students investigate series and parallel circuits in terms of current, potential difference and resistance. The module then moves onto electricity in the home and the efficiency of common appliances. Required Practical 15: Investigating resistance. Required Practical 16: Investigating electrical components. Assessment - P4 & 5 end of unit test and feedback.			P8 & P9 - Forces in balance, and motion. In this unit students compare scalar to vectors and calculate resultant forces. This module also investigates how to interpret motion graphs. Assessment - P8 & 9 end of unit test and feedback. Required Practical 20 & 21 Measuring the speed of waves in a ripple tank and on a string, Radiation and absorption.		
Year 10 Science teacher 1 (6 split)	P6 & P7 - Molecules, Matter and Radioactivity. This module covers energy in terms of changes of state and latent heat. Students compare alpha, beta and gamma radiation and predict half life from a graph. Required Practical 17: Calculating densities. Assessment - P6&7 end of unit test and feedback.	C3 - Structure and Bonding. This unit covers ionic, covalent and metallic bonding. Students will also research the different allotropes of carbon. Assessment - C3 end of unit test and feedback.	P1 & P2 - Energy: Conservation, Dissipation and transfer. Students calculate energy changes and efficiency as well as investigating heating and insulating buildings. Required Practical 14: Determining specific heat capacity. Assessment - P1 & 2 end of unit test and feedback.	C4 & C5 - Chemical calculations and changes. Students will develop the skills required to calculate formula masses, moles (HT only) and concentration. The module will then move onto applying the reactivity series to displacement reactions. Required Practical 8: Prepare a salt from an insoluble metal carbonate or oxide. Assessment - C4 & 5 end of unit test and feedback.	P4 & P5 Electricity: Circuits and the Home. Students investigate series and parallel circuits in terms of current, potential difference and resistance. The module then moves onto electricity in the home and the efficiency of common appliances. Required Practical 15: Investigating resistance. Required Practical 16: Investigating electrical components. Assessment - P4 & 5 end of unit test and feedback.	C6 & C7 - Electrolysis and Energy Change. Students will be able to predict products from liquid or aqueous electrolytes. They will then investigate exothermic and endothermic reactions and be able to interpret reaction profiles. Required Practical 9: Investigate the electrolysis of a solution. Required Practical 10: Investigating temperature changes in reacting solutions. Assessment - C6&7 end of unit test and feedback.		
Year 10 science teacher 2 (4 split)	B1 & B2 Cell Structure and Division. Students will investigate cells under a microscope and the movement of substances in and out of a cell. The module will then move onto cell division and stem cell ethics. Required Practical 1: Using a light microscope. Required Practical 2: Investigate the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue. Assessment - B1&2 end of unit test and feedback.	B3 & B4 Organisation of animals and plants. This unit investigates animal organisation in terms of the digestive system, enzymes and the heart. The unit them moves onto plant organisation by investigating transpiration in plants. Required Practical 4: Investigate the effect of pH on the rate of reaction of amylase enzyme. Assessment - B3&4 end of unit test and feedback.	B8 & B9 - Photosynthesis and Respiration. Students investigate the factors that effect the rate of photosynthesis. The module moves onto aerobic respiration and exercise, then anaerobic respiration in animals and other organisms. Required Practical 5: Investigate the effect of light intensity on the rate of photosynthesis. Assessment - B8&9 end of unit test and feedback.	B10 & B11 -Nervous and hormonal control. This unit considers how the nervous and hormonal system cause responses within the body. PD link - reproduction and contraception. Global link - Diabetes in developed worlds. Assessment - B10 & 11 end of unit test and feedback. (2 weeks of PPEs have been considered in the curriculum map).			

Year 10 Triple Biology	B1 & B2 Cell Structure and Division. Students will investigate cells under a microscope and the movement of substances in and out of a cell. The module will then move onto cell division and stem cell ethics. Required Practical 1: Using a light microscope. Required Practical 2: Investigate the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue. Assessment - B1&2 end of unit test and feedback.	B3 & B4 (+ Triple B5&6) Organisation of animals and plants. This unit investigates animal organisation in terms of the digestive system, enzymes and the heart. The unit then moves onto plant organisation by investigating transpiration in plants. Required Practical 5: Investigate the effect of pH on the rate of reaction of amylase enzyme. Required Practical 2: Investigate the effect of antiseptics or antibiotics on bacterial growth. Assessment - B3&4 end of unit test and feedback.	B8 & B9 - Photosynthesis and Respiration. Students investigate the factors that effect the rate of photosynthesis. The module moves onto aerobic respiration and exercise, then anaerobic respiration in animals and other organisms. Required Practical 5: Investigate the effect of light intensity on the rate of photosynthesis. Assessment - B8&9 end of unit test and feedback.	PAPER 2: B10 & B11 The Nervous System and Hormonal Control. This module covers reflex actions, structure of the brain and the eye, and correcting problems with the eye. Students will then investigate how hormones effect the body in terms of blood-glucose control, puberty, fertility and fertility treatment. Required Practical 7: Investigate the effect of a factor on human reaction time. Required Practical 8: Investigate the effect of light or gravity on the growth of newly germinated seedlings. Assessment - B10&11 end of unit test and feedback.	PAPER 2 - B12 -Homeostasis in Action. Students apply their understanding of homeostasis to temperature and water control. They will compare kidney transplants to dialysis machines. Assessment - B12 end of unit test and feedback.		
Year 10 Triple Chemistry	C2 & 3 - Transition elements and Structure & Bonding. This unit covers the transition elements along with ionic, covalent and metallic bonding. Students will also investigate the use of nanotechnology. Assessment - C2 & 3 end of unit test and feedback.	C4 & C5 - Chemical calculations and changes. Students will develop the mathematical skills required to calculate formula masses, moles and concentration. They will carry out titration reactions and calculate yields. The module will then move onto applying the reactivity series to displacement reactions. Required Practical 1: Prepare a salt from an insoluble metal carbonate or oxide. Required Practical 2: Use titration to investigate reacting volumes. Assessment - C4 & 5 end of unit test and feedback.	C6 & C7 - Electrolysis and Energy Change. Students will be able to predict products from liquid or aqueous electrolytes. They will then investigate exothermic and endothermic reactions and be able to interpret reaction profiles. Required Practical 3: Investigate the electrolysis of a solution. Required Practical 4: Investigating temperature changes in reacting solutions. Assessment - C6&7 end of unit test and feedback.	PAPER 2 - C8 & C9- Rates of reaction and crude oil and fuels. This unit applies collision theory to the rate of reactions, and covers the separation and use of hydrocarbons. Required Practical 5: Investigating the effect of concentration on rate of reaction. Assessment - C8 & C9 end of unit test and feedback.			
Year 10 Triple Physics	P6 & P7 - Molecules, Matter and Radioactivity. This module covers energy in terms of changes of state and latent heat. Students compare alpha, beta and gamma radiation and predict half life from a graph. Finally, students will investigate nuclear fission, fusion and nuclear issues. Required Practical 5: Calculating densities. Assessment - P6&7 end of unit test and feedback.	P1 & P2 - Energy: Conservation, Dissipation and Transfer. Students calculate energy changes and efficiency as well as investigating heating and insulating buildings. Required Practical 1: Determining specific heat capacity. Required Practical 2: Investigating thermal insulators. Assessment - P1 & 2 end of unit test and feedback.	P4 & P5 Electricity: Circuits and the Home. Students investigate series and parallel circuits in terms of current, potential difference and resistance. The module then moves onto electricity in the home and efficiency of common appliances. Required Practical 3: Investigating resistance. Required Practical 4: Investigating electrical components. Assessment - P4 & 5 end of unit test and feedback.	PAPER 2- P8 & P11 - Forces: Balance and Pressure. Students investigate resultant forces and moments. The module will also cover pressure on surfaces, in liquids and the atmosphere. Assessment - P8 & 11 end of unit test and feedback.			

Reporting Y11			CfCs & Grades		Rep & Grades		CfCs & Grades		BfL & Grades	
Year 11 Science Teacher 1 (7 split)	B11 recap - Hormonal control. This unit considers how the nervous and hormonal system cause responses within the body. Assessment - B10 & 11 end of unit test and feedback. (2 weeks of PPEs have been considered in the curriculum map).	C8 & C9 - Rates of reaction and crude oil and fuels. This unit applies collision theory to the rate of reactions, and covers the separation and use of hydrocarbons. Assessment - C8 & C9 end of unit test and feedback.	B12 - Reproduction. This unit covers how genes and genetic disorders are inherited with consideration of the ethics of screening embryos. Assessment - B12 end of unit test and feedback. (2 weeks of PPEs have been considered in the curriculum map)	B13 & B14 - Variation, evolution and genetics. This unit covers evolution by natural selection and the evidence to support this theory. Global link - Antibiotic resistant bacteria. The students also discover how living classification systems have changed over time. Assessment - B13 & 14 end of unit test and feedback.	C10 & C12 - Chemical analysis and the Earth's resources. Students will investigate how chemicals are analysed in terms of pure substances, mixtures, gases and chromatograms. They will then move onto investigating how water is treated, and how life cycle assessments can be used to assess the environmental impact of different products. Environmental impact of different materials. Assessment - C10 & 12 end of unit test and feedback.	B16 & 17 - Organising and ecosystem and biodiversity. This unit covers the cycling of materials in terms of decay, carbon and water. They will investigate how humans have an impact on such cycles, and the biodiversity of the planet. Global links and Geography links - Biodiversity and climate change. Time consideration for 2 weeks of PPEs. Assessment - B16 & 17 end of unit test and feedback. (2 weeks of PPEs have been considered in the curriculum map).	Paper 1 & 2 revision (alongside partner teacher).	Science exam window. Students will attend drop-down science revision sessions as listed in the Year 11 revision timetable.
Year 11 Science Teacher 2 (3 split)	P8 & P9 - Forces in balance, and motion. In this unit students compare scalar to vectors and calculate resultant forces. This module also investigates how to interpret motion graphs. Assessment - P8 & 9 end of unit test and feedback. Required Practical 20 & 21 Measuring the speed of waves in a ripple tank and on a string, Radiation and absorption. (2 weeks of PPEs have been considered in the curriculum map)				P10 & P13 -Forces, motion and electromagnetism. This units considers forces in terms of braking and momentum, then moves onto electromagnetism and the motor effect. Required Practical 19: Investigating the relationship between force and acceleration. Assessment - P10 & 13 end of unit test and feedback. (2 weeks of PPEs have been considered in the curriculum map)		Paper 1 & 2 revision. Revision of All sciences (alongside partner teacher).	Science exam window. Students will attend drop-down science revision sessions as listed in the Year 11 revision timetable.
Year 11 Science Teacher 1 (6 split)	C7 recap - exothermic and endothermic reactions and be able to interpret reaction profiles.	P8 & P9 - Forces in balance, and motion. In this unit students compare scalar to vectors and calculate resultant forces. This module also investigates how to interpret motion graphs. Assessment - P8 & 9 end of unit test and feedback.	C8 & C9 - Rates of reaction and crude oil and fuels. This unit applies collision theory to the rate of reactions, and covers the separation and use of hydrocarbons. Assessment - C8 & C9 end of unit test and feedback. (2 weeks of PPEs have been considered in the curriculum map)	Required Practical 20 & 21 Measuring the speed of waves in a ripple tank and on a string, Radiation and absorption.	P10 & P13 -Forces, motion and electromagnetism. This units considers forces in terms of braking and momentum, then moves onto electromagnetism and the motor effect. Required Practical 19: Investigating the relationship between force and acceleration. Assessment - P10 & 13 end of unit test and feedback.	C10 & C12 - Chemical analysis and the Earth's resources. Students will investigate how chemicals are analysed in terms of pure substances, mixtures, gases and chromatograms. They will then move onto investigating how water is treated, and how life cycle assessments can be used to assess the environmental impact of different products. Environmental impact of different materials. Assessment - C10 & 12 end of unit test and feedback. (2 weeks of PPEs have been considered in the curriculum map)	Paper 1 & 2 revision. Revision of All sciences (alongside partner teacher).	Science exam window. Students will attend drop-down science revision sessions as listed in the Year 11 revision timetable.
Year 11 Science Teacher 2 (4 split)	B12 - Reproduction. This unit covers how genes and genetic disorders are inherited with consideration of the ethics of screening embryos. Assessment - B12 end of unit test and feedback.	B13 & B14 - Variation, evolution and genetics. This unit covers evolution by natural selection and the evidence to support this theory. Global link - Antibiotic resistant bacteria. The students also discover how living classification systems have changed over time. Assessment - B13 & 14 end of unit test and feedback. (2 weeks of PPEs have been considered in the curriculum map)		B16 & 17 - Organising and ecosystem and biodiversity. This unit covers the cycling of materials in terms of decay, carbon and water. They will investigate how humans have an impact on such cycles, and the biodiversity of the planet. Global links and Geography links - Biodiversity and climate change. Time consideration for 2 weeks of PPEs. Assessment - B16 &	Paper 1 & Paper 2 Revision - Just Biology (2 weeks of PPEs have been considered in the curriculum map)			Science exam window. Students will attend drop-down science revision sessions as listed in the Year 11 revision timetable.
Year 11 Triple Science Biology	B13 & 14 Reproduction, Variation and Evolution. This unit covers genetics and inherited disorders, followed by the role inheritance plays in evolution. Assessment - B13 &14 end of unit test and feedback. (2 weeks of PPEs have been considered in the curriculum map)			B15 Genetics. Students research the contributions that Mendel, Darwin and Lamarck made towards advances in genetics. Students then look at how genetics can be used to classify animals and to develop evolutionary trees. Assessment will take place after the next unit.	B17 & B18 Cycling of Materials, Biodiversity and Ecosystems. This unit covers the cycling of materials in terms of decay, carbon and water. Required Practical 10: Investigating the effect of temperature on the rate of decay of fresh milk. B18 covers the impact of the growing human population on biodiversity and ecosystems. The unit moves onto the sustainability of global food production. Global links and geography links - human population explosion. Assessment B17& 18 end of unit test and feedback. (2 weeks of PPEs have been considered in the curriculum map)		Paper 1 & Paper 2 Revision	Science exam window. Students will attend drop-down science revision sessions as listed in the Year 11 revision timetable.

Year 11 Triple Science Chemistry	C9 Recap - Hydrocarbons. This unit covers the separation and use of hydrocarbons.	C10 & C11 Organic reactions and polymers. This unit covers alkenes, alcohols, esters and carboxylic acids, as well as the formation of polymers. Biology link - DNA polymer. Assessment - C10 & 11 end of unit test and feedback. (2 weeks of PPEs have been considered in the curriculum map)	C12 Chemical analysis. Students will investigate how chemicals are analysed in terms of pure substances, mixtures, gases, chromatograms and positive and negative ions. Required Practical 7: Use chemical tests to identify unknown compounds. Assessment - C12 end of unit test and feedback.	C14 & C15 Earth resources and using our resources. Students will investigate how water is treated, and how life cycle assessments can be used to assess the environmental impact of different products. they will move onto the use of alloys and the Haber process. Global links and DT links - Environmental impact of different materials. Required Practical 8: Purify and test water. Assessment - C14 & 15 end of unit test and feedback.(2 weeks of PPEs have been considered in the curriculum map)		Paper 1 & Paper 2 Revision	Science exam window. Students will attend drop-down science revision sessions as listed in the Year 11 revision timetable.
Year 11 Triple Science Physics	P9 & P10 Motion graphs and Force and motion. This module investigates how to interpret motion graphs, and links motion to acceleration, braking and car safety features. Required Practical 7: Investigating the relationship between force and acceleration. Assessment - P9 & 10 end of unit test and feedback.	P12 & P14 Wave properties and light. Required Practical 8: Investigating plane waves in a ripple tank and waves in a solid. Required Practical 9 Investigating the reflection and refraction of light. Required Practical 10: Investigating infrared radiation. Assessment - P12 & 14 end of unit test and feedback.(2 weeks of PPEs have been considered in the curriculum map)	P15 Electromagnetism. This unit investigates the motor effect, generators and transformers. Assessment - P15 end of unit test and feedback.	P16 Space. Students discover evidence to support the structure of stars, planets, the solar system and expanding universe. Assessment - P16 end of unit test and feedback.(2 weeks of PPEs have been considered in the curriculum map)		Paper 1 & Paper 2 Revision	Science exam window. Students will attend drop-down science revision sessions as listed in the Year 11 revision timetable.