The Farnborough Academy

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Subject: Year 10

SCIENCE

Autumn 1 Topic:	Autumn 2 Topic:	Spring 1 Topic:	Spring 2 Topic:	Summer 1 Topic:	Summer 2 Topic:
11P- Atomic structure	12C- Bonding	13B- Bioenergetics	14P- Forces 1	15C- Chemical change	**16B- Homeostasis**
Structure of an atom	Intro to bonding	Photosynthesis- what where how why & rate	Scalar & vector quantities, contact and non-contact forces	Metal oxides	Homeostasis - what where why
Structure of an atom & isotopes	Ionic bonding	Light intensity & photosynthesis investigation RP6	Gravity & weight	Reactivity series & reactions with water and acid	CNS & neurones. Stimulus receptor coordinator effector response
Development of the model of the atom	Dot & cross ionic bonding	Limiting factors (HT)	Resultant forces	Extraction of metals and reduction	Reflex arc
Mid topic assessment	Ionic compounds	Uses of glucose	Work done and energy transfer W=Fs	pH scale & neutralisation	Reaction time RP 7
Nuclear decay & nuclear equations	Covalent bonding- giant	Mid topic assessment	Force & elasticity F=ke	Titrations	Brain
Half life	Covalent bonding small mole	Respiration- what where how why	Investigation between force & extension RP 6	Neutralisation of acids with salt production	Eye & adaptation to light
Contamination & irradiation	Metallic bonding	Anaerobic respiration- animals, plants & yeast	Mid topic assessment	Soluble salts- RP 1	Accomodation
Hazards & uses of radioactive emissions & background radiation	Properties of metals	Exercise & respiration	Moments, levers & gears	Soluble salts- RP 1	Mid topic assessment
Uses of nuclear radiation	Mid topic assessment	Oxygen debt (HT)	Pressure in fluid p=F/A	Reactions of acids with metals	Temperature control
Nuclear fission	Solids, liquids & gases	Metabolism	Pressure in fluid p=hpg	Mid topic assessment	Hormonal control - what where when
Nuclear fusion	Predicting states & state s	Revise	Atmospheric pressure	Process of electrolysis	Blood glucose control
Revise	Properties of ionic compour	CHECKPOINT ASSESSMENT 13	Displacement, distance & speed s= vt	Electrolysis of molten ionic compounds	Negative feedback and glucose control (HT)
CHECKPOINT ASSESSMENT 11	Properties of small covalen	DIRT	Velocity & distance-time graphs	Electrolysis of aqueous solutions RP 3	Water & nitrogen control
DIRT	Polymers	**Intent:** How do plants harness the Sun's energy to make food? How does photosynthesis affect the Earth's atmosphere? How do animals and plants then use this food and what if there is no or not enough oxygen? And most importantly, why can I only run so fast?	Acceleration & velocity-time graphs	Reactions at electrodes half equations (HT)	Filtration & selective reabsorption in the kidneys
Intent: The Curies helped discover radioactivity over a century ago. Since then scientists have taken the knowledge further to understand the structure of atoms and nuclear forces. Atomic structure is one of the main areas of physics and is essential for understanding some of the more modern and complex issues facing today's society.	Giant covalent structures		Calculating acceleration	Electrolysis & the extraction of metals	Revise
	Metals & alloy's properties		Revise	Revise	CHECKPOINT ASSESSMENT 16
	Allotropes of carbon- diamo graphite		CHECKPOINT ASSESSMENT 14	CHECKPOINT ASSESSMENT 15	DIRT
	Graphene & Fullerenes		DIRT	DIRT	**Intent:** Cells in the body can only survive within narrow physical and chemical limits. They require a constant temperature and pH as well as a constant supply of dissolved food and water. How does our body constantly monitor and adjust for this? What parts do the nervous and endocrine (hormonal) systems play?
	Nanoparticles		**Intent:**Engineers analyse and calculate forces when designing a great variety of machines and instruments from roads, bridges, roller coasters all the way up to rockets and space stations. Anything mechanical can be analysed in this way. Recent development in artificial limbs use the analysis of forces to enable many more people to take part in activities once thought impossible.	**Intent:** 15C- Scientists use systematic chemical reactions to learn how to make the huge numbers of useful and life-saving chemicals that we are dependent upon as a species	
	Revise				
	CHECKPOINT ASSESSME				
	DIRT				
	Intent: 12C- Why are all the chemicals around us so different? Understanding how atoms react around us explains why…				

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Assessment:

Mid topic assessment:

- These will be completed approximately midway through the topic (each is approximately 16 lessons).
- These will be peer or self-assessed to ensure immediate feedback
- An indicative grade will be provided
- The intent is to assess how well students have understood the first half of the new topic
- This informs both the teacher and student of areas for improvement for revision prior to the Checkpoint Assessment.

Checkpoint Assessment:

- These will be completed at the end of the topic (each is approximately 16 lessons).
- These will be teacher marked with feedback **within 3 days**
- A DIRT lesson focusing on individuals' areas of weakness
- An indicative grade will be provided
- The intent is to assess how well students have understood the topic and to identify strengths and weaknesses across the year group. This will inform RAG meetings
- This informs both the teacher and student of areas for improvement before their end of Year Exams/mocks.

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Autumn 1 Topic:	Autumn 2 Topic:	Spring 1 Topic:	Spring 2 Topic:	Summer 1 Topic:
17P- Forces 2	18C- Energy changes	19B- Homeostasis 2	20P- Waves	21C- Organic Chemistry
Newton's first law	Intro to energy transfer	Hormones & menstrual cycle	Transverse & longitudinal waves	Crude oil, hydrocarbons and alkanes
Newton's second law	Exothermic and endothermic reactions RP 4	Interaction of female menstrual hormones (HT)	Properties of waves- amplitude, wavelength, frequency & period	Fractional distillation & petrochemicals
Investigating the effect of varying force on acceleration RP7	Reaction profiles	Contraception	Observations for suitability of apparatus to measure waves RP 8	Properties of hydrocarbons
Newton's third law	The energy change of reactions (HT)	Hormones & infertility (HT)	Mid topic assessment	Cracking and alkenes
Mid topic assessment	Cells & batteries	Negative feedback & thyroxine & adrenaline (HT)	Reflection of waves	Structure & formulae of alkenes
Stopping distance	Fuel cells	Plant hormones (auxin, gibberellins & ethene)	Reflection & refraction practical RP 9	Reactions of alkenes
Reaction time	Revise	Effect of light/gravity on growth of seedlings RP 8	Sound waves	Mid topic assessment
Factors affecting braking distance	CHECKPOINT ASSESSMENT 18	Uses of plant hormones	Waves for detection & exploration	Alcohols
Momentum	DIRT	Revise	Types of electromagnetic waves	Carboxylic acids
Conservation of momentum	**Intent:** 18C- Why do some chemical reactions get hot and others get cold? How can this be useful for products such as self-heating cans and hand warmers?	CHECKPOINT ASSESSMENT 19	Properties of electromagnetic waves reflection, refraction, absorb, transmit	Addition polymerisation
Changes in momentum		DIRT	IR radiation investigation RP 10	Condensation polymerisation (HT)
Revise		**Intent:** This section will explore the hormonal system which usually brings about much slower changes. Hormonal coordination is particularly important in reproduction since it controls the menstrual cycle. An understanding of the role of hormones in reproduction has allowed scientists to develop not only contraceptive drugs but also drugs which can increase fertility	Properties of electromagnetic waves circuits	Amino acids (HT)
CHECKPOINT ASSESSMENT 17			Uses of waves	DNA and other naturally occuring polymers
DIRT			Lenses	Revise
Intent: Newton first described how objects moved over 300 years ago and they are still used to this day. Every car, plane and other method of transport use these laws to move people and objects all over the planet, indeed even into space.			Visible light	CHECKPOINT ASSESSMENT 21
			Black body radiation	DIRT
			Perfect black bodies & radiation	**Intent:** 21C- Crude oil is one of the biggest causes of war in our modern world. Why is this thick, dirty liquid so in demand?
			Revise	
			CHECKPOINT ASSESSMENT 20	
			DIRT	
			Intent: Wave behaviour is common is both natural and human-made systems. Waves carry energy from one place to another and are now heavily used across the world to carry information. All communication systems such as imaging, mobile phones, television and internet use waves.	