KS5 Physics (OCR A) – Lower 6th Michaelmas Term 1/2 Learning Program: Teacher 1, Modules 2/3

Topic/Content	Objectives/Skills	Homework	Assessment	Success Criteria (A* - E at KS5)	Stretch & Challenge
2.3.1 Scalars and Vectors **a** scalar and vector quantities **b** vector addition and subtraction **c** vector triangle to determine the resultant of any two coplanar vectors **d** resolving a vector into two perpendicular components; $F_x = F \cos \vartheta$ $F_y = F \sin \vartheta$	Demonstrate knowledge, understanding, and application of: • scalar and vector quantities • addition of two vectors with scale drawings and with calculations • resolution of a vector into two perpendicular components • calculations involving vectors.	Textbook (pg 12-19) read and attempt summary questions Prepare / revise for mini-assessment in lesson on scalars and vectors Checklist review	Self-assess answers Mini-assessment (Past Paper questions) Update list	Assessments & tests assigned a grade score based on previous national exam year boundaries. Raw %-correct score assigned a grade A-U (A-E, U) at lower 6th; A* not awarded / achievable until upper 6th. PAGs are assessed "pass / fail" on skills list associated with each PAG. Class tracker updated after each PAG. By end of U6th must have at least one pass in every skill for a **Pass** in Practical Endorsement.	Kerboodle Resources: Support Sheets 2.3 and 2.5 MyMaths activities
3.1.1 Kinematics **a** displacement, instantaneous speed, average speed, velocity, and acceleration **b** graphical representations of displacement, speed,	Demonstrate knowledge, understanding, and application of: • average speed • instantaneous speed • distance–time graphs to determine speed	Textbook (pg 22-30) read and attempt summary questions Prepare / revise for full topic test on kinematics Checklist review	Self-assess answers Topic Test Update list		Kerboodle Resources: Calculation Sheet 3 – Using v/t graphs MyMaths activities

velocity, and acceleration **c** displacement–time graphs; velocity is gradient **d** velocity–time graphs; acceleration is gradient; displacement is area under graph.	• displacement • velocity • displacement–time graphs to determine velocity • acceleration • velocity–time graphs to determine acceleration • velocity–time graphs to determine displacement.				
3.1.2 Linear Motion **a i** the equations of motion for constant acceleration in a straight line, including motion of bodies falling in a uniform gravitational field without air resistance $v = u + a\,t$ $s = \frac{1}{2}(u + v)\,t$ $s = u\,t + \frac{1}{2}a\,t^2$	Demonstrate knowledge, understanding, and application of: • the equations of motion for constant acceleration in a straight line • thinking distance and braking distance • the effect of reaction time on total stopping	Textbook (pg 31-39) read and attempt summary questions *Complete PAG analysis / conclusion / evaluation* Prepare / revise for full topic test on linear motion Checklist review	Self-assess answers PAG 1.1 Finding 'g' Topic Test Update list		Kerboodle Resources: Calculation Sheet 3.5 – Linear Motion MyMaths activities

$v^2 = u^2 + 2\,a\,s$ **ii** techniques and procedures used to investigate the motion and collisions of objects **b i** acceleration *g* of free fall **ii** techniques and procedures used to determine the acceleration of free fall using trapdoor and electromagnet arrangement, or light gates and timer **c** reaction time and thinking distance; braking distance and stopping distance for a vehicle.	distance of a vehicle • the equations of motion for falling objects in a uniform gravitational field • the acceleration due to free fall *g* • an experiment to determine *g*.				

KS5 Physics (OCR A) – Lower 6th Michaelmas Term 1/2 Learning Program: Teacher 2, Module 4

Topic/Content	Objectives/Skills	Homework	Assessment	Success Criteria (A* - E at KS5)	Stretch & Challenge
4.1.1 Charge and Current **a** electric current as rate of flow of charge; $I = \frac{\Delta Q}{\Delta t}$ **b** the coulomb as the unit of charge **c** the elementary charge, $e = 1.60 \times 10^{-19}$ C **d** net charge on a particle or an object is quantised and a multiple of *e* **e** current as the moment of electrons in metals and movement of ions in electrolytes **f** conventional current and electron flow **g** Kirchhoff's first law; conservation of charge.	Demonstrate knowledge, understanding, and application of: • electric current as rate of flow of charge $I = \frac{\Delta Q}{\Delta t}$ • the coulomb as the unit of charge • the elementary charge $e = 1.60 \times 10^{-19}$ C • net charge on a particle or an object is quantised and a multiple of *e* • current as the movement of charged particles • conventional current and electron flow • Kirchhoff's first law and the conservation of charge.	Textbook (pg 118-126) read and attempt summary questions Prepare / revise for full topic test on charge and current Checklist review	Self-assess answers Topic Test Update list	Assessments & tests assigned a grade score based on previous national exam year boundaries. Raw %-correct score assigned a grade A-U (A-E, U) at lower 6th; A* not awarded / achievable until upper 6th. PAGs are assessed "pass / fail" on skills list associated with each PAG. Class tracker updated after each PAG. By end of U6th must have at least one pass in every skill for a **Pass** in Practical Endorsement.	Kerboodle Resources: 1) Maths Skills 8 Charge and Current (interactive) 2) Stretch and Challenge 8: How fast do electrons travel? 3) Application 8.2: Charge and electrolysis in silver plating
4.1.2 Mean Drift Velocity **a** mean drift velocity of charge carriers	Demonstrate knowledge, understanding, and application of: • mean drift velocity of charge carriers	Textbook (pg 127-130) read and attempt summary questions	Self-assess answers		Kerboodle Resources: Calculation Sheet 8.4

b $I = A\,n\,e\,v$ where n is the number density of charge carriers **c** distinction between conductors, semiconductors, and insulators in terms of n.	• the equation $I = A\,n\,e\,v$ • distinction between conductors, semiconductors, and insulators in terms of n.	Charge and Current Support 8 HW Q sheet (*Kerboodle*) Checklist review	Teacher-marked Update list		Drift Velocity Investigate models of electron flow (water systems, bike chains etc)
4.2.1 Circuit Symbols **a** circuit symbols **b** circuit diagrams using these symbols. ***4.2.2 Emf and Pd*** **a** potential difference (p.d.); the unit volt **b** electromotive force (e.m.f.) of a source such as a cell or a power supply **c** distinction between e.m.f. and p.d. in terms of energy transfer **d** energy transfer; $W = V\,Q$ and $W = \mathcal{E}\,Q$ **e** energy transfer; $e\,V = \frac{1}{2} m\,v^2$ for electrons and other charged particles.	Demonstrate knowledge, understanding, and application of: • circuit symbols • circuit diagrams using these symbols • potential difference and the volt • electromotive force • distinction between e.m.f. and p.d. • energy transfer $W = V\,Q$ and $W = \mathcal{E}\,Q$ • energy transfer $e\,V = \frac{1}{2} m\,v^2$ for electrons and other charged particles.	Textbook (pg 138-142) read and attempt summary questions Checklist review	Self-assess answers Update list		Pg 143-4 textbook 'The Electron Gun' (reviewed in U6th electric fields)

4.2.3 Resistance **a** resistance; $R = \frac{V}{I}$; the unit ohm **b** Ohm's law **c i** *I*–*V* characteristics of resistor, filament lamp, diode, and light-emitting diode (LED) **ii** techniques and procedures used to investigate the electrical characteristics for a range of ohmic and non-ohmic components. d) light-dependent resistor (LDR); variation of resistance with light intensity.		Textbook (pg 145-150) read and attempt summary questions Prepare / Revise for topic test on circuits and resistance Checklist review	Self-assess using textbook answers Topic Test Update checklist		
4.2.4 Resistivity **a i** resistivity of a material; the equation $R = \frac{\rho L}{A}$ **ii** techniques and procedures used to	Demonstrate knowledge, understanding, and application of: • resistivity of a material; the equation $R = \frac{\rho L}{A}$ • the variation of resistivity of metals	Textbook (pg 153-6) read and attempt summary questions *Complete PAG analysis / conclusion / evaluation*	Self-assess using textbook answers PAG 3.1 Resistivity of a Metal		Kerboodle resources: 9.7 Support: Resistance and resistivity 9.4 Maths skills: Resistance

determine the resistivity of a metal **b** the variation of resistivity of metals and semiconductors with temperature. **c** negative temperature coefficient (NTC) thermistor; variation of resistance with temperature.	and semiconductors with temperature.				9 Stretch and challenge: Resistivity and the National Grid