



Sequence						
TOPIC (S) Astrophysics	<ol style="list-style-type: none"> 1. Refracting Telescopes 2. Reflecting Telescopes 3. EM Telescopes 4. CCDs 5. Magnitude of Stars 	<ol style="list-style-type: none"> 6. Temperature and Black Body Radiation 7. Star Classes 8. Hertzsprung-Russell diagrams 9. Supernovae, neutron stars and black holes 	<ol style="list-style-type: none"> 10. Doppler Effect 11. Hubble's Law 12. Quasars 13. Detection of Exoplanets 			
Knowledge & Skills development	<ul style="list-style-type: none"> • Ray diagram to show the image formation in normal adjustment for a refracting telescope • Ray diagram to show path of rays through the telescope up to the eyepiece of a Cassegrain arrangement using a parabolic concave primary mirror and convex secondary mirror • Relative merits of reflectors and refractors including a qualitative treatment of spherical and chromatic aberration • Similarities and differences of radio telescopes compared to optical telescopes including structure, positioning and use, together with comparisons of resolving and collecting powers • The Rayleigh Criterion and minimum angular resolution of telescopes • Comparison of the eye and CCD as detectors in terms of quantum efficiency, resolution, and convenience of use • The Hipparcos scale of apparent and absolute magnitude of stars • Definitions of parsecs, light years and astronomical units • Stefan's law and Wein's displacement law 			<ul style="list-style-type: none"> • Descriptions of the main spectral classes of stars • The general shape of HR diagrams and axis scales (including main sequence, dwarfs and giants) • Path of a star similar to our Sun on the HR diagram from formation to white dwarf • Defining properties of supernovae, neutrons stars and black holes • Calculation of the radius of the event horizon for a black hole • Use of type 1a supernovae as standard candles to determine distances and the shape of the light curve of a typical type 1a supernova • Controversy concerning accelerating Universe and dark energy • Doppler effect/red shift calculations • Simple interpretation as expansion of universe; estimation of age of universe, assuming H is constant • Formation, discovery and properties of quasars • Radial velocity and transit methods to detect exoplanets 		
Assessment / Feedback Opportunities	Exam questions – teacher assessed	Exam questions – self assessed	Extended writing task – teacher assessed	Deep marking of required practical in lab books	Topic assessment	
Cultural Capital	<ul style="list-style-type: none"> • • 					
SMSC / Promoting British Values <small>(Democracy, Liberty, Rule of Law, Tolerance & Respect)</small>	<ul style="list-style-type: none"> • • 					
Reading opportunities	<ul style="list-style-type: none"> • Recommended Read: Astrophysics for People in a Hurry by Neil Degrasse Tyson • Recommended Read: AQA A level Physics: Astrophysics by Dr Asad Altimeemy 					

Key Vocabulary	Independent Variable, Dependent Variable, Control Variables, Method, Conclusion, Precaution, Evaluation, Reliable, Precision, Valid, Anomaly, Describe, Explain, Compare, Analyse, Calculate, Suggest, Absolute, Uncertainty, Error Refract, Reflect, Normal Adjustment, Parabolic, Aberration, Convex, Concave, Criterion, Resolution, Quantum Efficiency, Parsec, Light year, Supernova, Neutron Star, Blackhole, Event Horizon, Dark Matter, Dark Energy, Quasar, Exoplanets, Red Shift
Digital Literacy	The use of excel to plot graphs and analyse data MSOffice365 apps including SharePoint
Cross-Curricular Links	Numeracy/Maths – logarithmic equations, averages (means), reading scales, graph plotting, lines of best fit, using and rearranging equations, using scientific calculators
Careers	Astrophysicist