Science Department
Curriculum and Assessment Map

	Half Term 1	Half-Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
Year 11	**Forces in balance** **Motion**	**Force and Motion**	**Wave Properties** **Electromagnetic waves**	**Electromagnetism and Revision**	**GCSE Exam Revision**	**GCSE Exam Revision**
Fundamental Knowledge	1. Define 'scalar' and 'vector' quantities. 2. Compare a scalar and a similar vector and explain how these quantities are different. 3. Categorise a wide range of quantities as either a vector or a scalar. 4. Draw a scale diagram to represent a single vector. 5. Use scale diagrams to represent the sizes of forces acting on an object. 6. Give examples of contact and non-contact forces.	1. Describe the effect of changing the mass or the force acting on an object on the acceleration of that object. 2. Perform calculations involving the rearrangement of the F = ma equation. 3. Required practical: Investigate the effect on the acceleration of an object of varying the force on it and of varying its mass. 4. State the difference between the mass of an object and its weight. 5. Calculate the weight of objects	1. Identify waves as either transverse or longitudinal. 2. Compare transverse and longitudinal waves in terms of direction of vibration and propagation. 3. Investigate wave motion through a spring model. 4. Identify waves as either mechanical or electromagnetic. 5. Compare transverse and longitudinal waves in terms of direction of vibration and propagation.	1. State the names of the poles of a magnet. 2. Describe the interaction of magnetic poles (attraction and repulsion). 3. List some magnetic and non-magnetic metals. 4. State that the magnetic field produced by a current carrying wire is circular. 5. Describe the effect of increasing the current on the magnetic field around a wire. 6. Describe the effect of reversing the		

	7. Describe the action of pairs of forces in a limited range of scenarios. 8. Compare the sizes of forces using the unit newton (N). 9. Calculate resultant force produced by several forces acting on an object in coplanar directions. 10. Describe the effect of zero and non-zero resultant forces on the motion of moving and stationary objects. 11. Define 'centre of mass'. 12. Describe an experimental technique to determine the centre of mass of an irregular object. 13. Use lines of symmetry to identify the location of the centre of mass of regular object. 14. Find the resultant of two forces at an acute angle by drawing a scale diagram.	using their mass and the gravitational field strength. 6. Apply the concept of balanced forces to explain why an object falling through a fluid will reach a terminal velocity. 7. Investigate the relationship between the mass of an object and the terminal velocity. 8. Categorise factors which affect thinking distance, braking distance and both. 9. Calculate the braking and thinking distance of a car. 10. Describe the relationship between speed and both thinking and braking distance. 11. Apply the equation p = mv to find the momentum, velocity or mass of an object. 12. Use the principle of conservation of momentum to find	6. Compare electromagnetic and mechanical waves in terms of the need for a medium. 7. Calculate the period of a wave from its frequency. 8. Calculate the wave speed from the frequency and wavelength. 9. Use a wave front model to explain refraction and reflection. 10. Describe the relationship between the angle of incidence and angle of refraction. 11. Explain refraction in terms of changes in the speed of waves when they move between one medium and another. 12. Measure the speed of a wave in water. 13. Measure the speed of a wave in a solid (string). 14. Describe the effect that changing the frequency of a wave has on its	direction of the current in the wire. 7. Sketch the shape of a magnetic field around a bar magnet. 8. Describe how the shape of a magnetic field can be investigated. 9. Compare the Earth's magnetic field to that of a bar magnet. 10. Use the corkscrew rule to determine the direction of the field around a current carrying wire. 11. Describe the shape of the field produced by a solenoid. 12. Describe the operation of a moving-coil loudspeaker. 13. Apply Fleming's left-hand rule to determine the direction of the force acting on a conductor. 14. Calculate the force acting on a conductor when it is placed in a magnetic field.		

	15. Calculate the component of a force using scale diagrams and ratios. 16. Resolve a single force into two perpendicular components. 1. Use the gradients of distance-time graphs to compare the speeds of objects. 2. Estimate typical speeds for walking, running, and cycling. 3. Describe the motion of an object by interpreting distance-time graphs. 4. Calculate the speed of an object and the time taken to travel a given distance. 5. Identify the features of a velocity-time graph. 6. Recall the equation relating velocity, acceleration, and time. 7. Calculate the change in velocity for an object under constant acceleration	the velocities of objects. 13. Explain how the behaviour of objects during explosions shows the conservation of momentum. 14. State Hooke's law. 15. Explain the limitations of Hooke's law including the limit of proportionally. 16. Calculate the force required to cause a given extension in a spring using the spring constant. 17. Compare materials in terms of elastic and non-elastic behaviour. 18. Required practical: Investigate the relationship between force and extension for a spring.	wavelength in a medium. 15. Calculate the speed of waves using the wave speed equation. 16. Required practical: Investigating plane waves in a ripple tank and waves in a solid. 17. State that electromagnetic waves transfer energy without transferring matter. 18. Identify the position of EM waves in the spectrum in order of wavelength and frequency. 19. State that all EM waves travel at the same speed in a vacuum. 20. State that white light is a part of the EM spectrum and composed of a range of frequencies. 21. List some simple examples of the uses of light, microwaves, and radio waves. 22. State that radio waves and			

	for a given period of time. 8. Describe sections of velocity-time graphs, and compare the acceleration in these sections. 9. Measure the acceleration of an object as it moves down a ramp. 10. Calculate the speed of an object by extracting data from a distance-time graph. 11. Use a tangent to determine the speed of an object from a distance-time graph. 12. Use the equation $v^2 - u^2 = 2as$ in calculations where the initial or final velocity is zero.		microwaves are used in communications through the atmosphere. 23. State that the higher the frequency of a wave, the greater the rate of data transfer possible. 24. Describe the sub-regions of the radio spectrum. 25. Describe the uses and dangers of UV radiation. 26. Describe the uses and dangers of X-rays and gamma radiation. 27. State some safety procedures that take place during the operation of devices that produce ionising radiation. 28. Describe the formation of an X-ray photograph in terms of absorption or transmission. 29. State that X-ray therapy can be used to kill cancerous cells in the body. 30. Explain why a particular wave is suited to its application.			

			31. Explain how various safety features reduce exposure to ionising radiation. 32. Required practical: Investigating infrared radiation.			
Learning Checkpoint Tasks	• Scalar and vector quantities • Resultant forces • Motion graphs	• Newton's second law • Forces and braking	• Types of waves • The wave equation • The EM spectrum • Uses of EM waves	• Magnetic materials • Solenoids and electromagnets		
Common Assessment Task	**Paper 1 Mock Exam**		**Paper 2 Mock Exam**			
Mock Exam (if applicable)	**Paper 1 Mock Exam**		**Paper 2 Mock Exam**			
Interleaved Knowledge	Key knowledge acquired previously during the GCSE course: • Energy • Electricity		Key knowledge acquired previously during the GCSE course: • Molecules and matter • Atoms and radiation • Forces			