Kings Langley School
Unlocking Potential for Life

I can do statements
KS4 - Year 11
Physics

Student Knowledge and Skills Tracker for Year 11 Physics

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P8 and P10 Forces	Check 1	Check 2	Check 3	Check 4
I can draw a scale diagram to represent a single vector.				
I can categorise a wide range of quantities as either a vector or a scalar.				
I can compare a scalar and a similar vector and explain how these quantities are different.				
I can use scale diagrams to represent the sizes of forces acting on an object.				
I can describe the action of pairs of forces in a limited range of scenarios.				
I can investigate the effect of different lubricants on the size of frictional forces.				
I can draw a scaled diagram of the forces acting in a range of situations using arrows to represent the forces.				
I can calculate resultant force produced by several forces acting on an object in coplanar directions.				
I can describe the effect of zero and non-zero resultant forces on the motion of moving and stationary objects.				
I can describe an experimental technique to determine the centre of mass of an object.				
I can explain why a suspended object comes to rest with the centre of mass directly below the point of suspension in terms of balanced forces.				
I can compare the stability of objects to the position of their centre of mass of an object, identifying the likely sources of error leading to inaccuracy.				
I can find the resultant of two forces at an acute angle by drawing a scale diagram.				
I can describe a system in equilibrium in which non-parallel forces are acting.				
I can calculate the component of a force using scale diagrams and ratios.				
I can resolve a single force into two perpendicular components.				
I can determine if an object is in equilibrium by considering the horizontal and vertical forces.				
I can investigate the effect of increasing the weight of an object on a slope on the component of the weight acting along the slope.				

I can describe the effect of changing the mass or the force acting on an object on the acceleration of that object.				
I can perform calculations involving the rearrangement of the F = ma equation.				
I can combine separate experimental conclusions to form an overall conclusion.				
I can calculate the weight of objects using their mass and the gravitational field strength.				
I can explain the limitations of Hooke's law including the limit of proportionally.				
I can calculate the force required to cause a given extension in a spring using the spring constant.				
I can compare the behaviour of different materials under loads in terms of proportional and non-proportional behaviour.				

P9 Motion	Check 1	Check 2	Check 3	Check 4
I can use the gradients of distance-time graphs to compare the speeds of objects.				
I can describe the motion of an object by interpreting distance-time graphs.				
I can calculate the speed of an object and the time taken to travel a given distance,				
I can identify the features of a velocity-time graph.				
I can rearrange the acceleration equations in calculations.				
I can calculate the change in velocity for an object under constant acceleration for a given period of time.				
I can calculate the distance travelled using information taken from a velocity-time graph for one section of motion.				
I can calculate the speed of an object by extracting data from a distance-time graph.				
I can use a tangent to determine the speed of an object from a distance-time graph.				
I can use the gradient of a velocity-time graph to determine the acceleration of an object.				
I can apply transformations of the equation v2 – u2 = 2as in calculations involving change in velocity and acceleration where both velocities are non-zero.				
I can calculate the distance travelled using information taken from a velocity-time graph for one section of motion.				
I can apply the concept of balanced forces to explain why an object falling through a fluid will reach a terminal velocity.				
I can investigate the relationship between the mass of an object and the terminal velocity.				
I can categorise factors which affect thinking distance, braking distance and both.				
I can calculate the braking distance of a car.				
I can describe the relationship between speed and both thinking and braking distance.				
I can apply the equation p = mv to find the momentum, velocity or mass of an object.				
I can describe how the principle of conservation of momentum can be used to find the velocities of objects.				
I can investigate the behaviour of objects during explosions to verify the conservation of momentum.				

P12 Waves properties	**Check 1**	**Check 2**	**Check 3**	**Check 4**
I can investigate wave motion through a spring model.				
I can compare transverse and longitudinal waves in terms of direction of vibration and propagation.				
I can compare electromagnetic and mechanical waves in terms of the need for a medium.				
I can outline the derivation of the wave speed equation.				
I can calculate the period of a wave from its frequency.				
I can calculate the wave speed from the frequency and wavelength.				
I can describe refraction at a boundary in terms of wavefronts.				
I can describe refraction including the reflected rays.				
I can explain partial absorption as a decrease in the amplitude of a wave and therefore the energy carried.				
I can measure the speed of a wave in a string.				
I can describe the effect that changing the frequency of a wave has on its wavelength in a medium.				
I can calculate the speed of waves using the wave speed equation.				

P13 Electromagnetic waves	Check 1	Check 2	Check 3	Check 4
I can describe the relationship between the energy being transferred by an electromagnetic wave and the frequency of the wave.				
I can calculate the frequency and the wavelength of an electromagnetic wave.				
I can explain why the range of wavelengths detected by the human eye is limited.				
I can describe how a range of electromagnetic waves are used in a variety of scenarios.				
I can explain why a particular wave is suited to its application.				
I can determine whether the law of reflection applies to a microwave signal.				
I can compare the rate of information transfer through optical fibres and radio signals.				
I can outline the operation of a mobile phone network and the waves used.				
I can discuss the evidence for mobile phone signals causing damage to humans.				
I can describe the penetrating powers of gamma rays, X-rays, and ultraviolet rays.				
I can compare X-rays and gamma radiation in terms of their origin.				
I can describe the ionisation of atoms in simple terms.				
I can describe the operation of an X-ray machine.				
I can explain why contrast media can be used during X-rays.				
I can describe the factors that affect the radiation doses received by people.				

P15 Electromagnetism	**Check 1**	**Check 2**	**Check 3**	**Check 4**
I can state the names of the poles of a magnet.				
I can describe the interaction of magnetic poles (attraction and repulsion).				
I can list some magnetic and non-magnetic metals.				
I can state that the magnetic field produced by a current carrying wire is circular.				
I can describe the effect of increasing the current on the magnetic field around a wire.				
I can describe the effect of reversing the direction of the current in the wire.				
I can describe the operation of a moving-coil loudspeaker.				
I can apply Fleming's left-hand rule to determine the direction of the force acting on a conductor.				
I can calculate the force acting on a conductor when it is placed in a magnetic field.				
I can perform calculations involving rearrangements of the equation $F = BIl$.				
I can investigate the factors that affect the rotation of an electric motor.				
I can sketch the shape of a magnetic field around a bar magnet.				
I can describe how the shape of a magnetic field can be investigated.				
I can compare the Earth's magnetic field to that of a bar magnet.				