**Personalised Learning Checklist**

Subject: Physics

Year group: Year 12

Dear Student,

During the academy closure you have been set a number of tasks. The list below is the learning you should have completed. Your teacher will use the list to check your progress during this time. It may be used for short quizzes, mini assessments or homework. Where there are gaps your lessons will focus on improving your knowledge and understanding.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Objective | My personal RAG rating (Red- do not understand, Amber- some understanding, Green- I am confident | | | Teacher RAG rating |
| Be able to use the Hooke’s law equation, ∆F = k∆x, where k is the stiffness of the object. | RED | AMBER | GREEN |  |
| Understand how to use the relationships: | RED | AMBER | GREEN |  |
| (tensile or compressive) stress = force/cross-sectional area | RED | AMBER | GREEN |  |
| (tensile or compressive) strain= change in length/original length Young modulus = stress/strain | RED | AMBER | GREEN |  |
| Be able to draw and interpret force-extension and force-compression graphs. | RED | AMBER | GREEN |  |
| Understand the terms limit of proportionality, elastic limit, yield point, elastic deformation and plastic deformation and be able to apply them to these graphs. | RED | AMBER | GREEN |  |
| Be able to draw and interpret tensile or compressive stress-strain graphs, and understand the term breaking stress. | RED | AMBER | GREEN |  |
| Be able to calculate the elastic strain energy Eel in a deformed material sample, using the equation ∆Eel = 12 F∆x , and from the area under the force-extension graph | RED | AMBER | GREEN |  |
| The estimation of area and hence energy change for both linear and non-linear force-extension graphs is expected. | RED | AMBER | GREEN |  |
| Waves and Particle Nature of Light | RED | AMBER | GREEN |  |
| Understand what is meant by plane polarisation. | RED | AMBER | GREEN |  |
| Understand what is meant by diffraction and use Huygens’ construction to explain what happens to a wave when it meets a slit or an obstacle | RED | AMBER | GREEN |  |
| Be able to use nλ = dsinθ for a diffraction grating. | RED | AMBER | GREEN |  |
| Understand how diffraction experiments provide evidence for the wave nature of electrons. | RED | AMBER | GREEN |  |
| Be able to use the de Broglie equation λ = hp. | RED | AMBER | GREEN |  |
| Understand that waves can be transmitted and reflected at an interface between media | RED | AMBER | GREEN |  |
|  | RED | AMBER | GREEN |  |
| Understand how a pulse-echo technique can provide information about the position of an object and how the amount of information obtained may be limited by the wavelength of the radiation or by the duration of pulses | RED | AMBER | GREEN |  |
|  | RED | AMBER | GREEN |  |
| Understand how the behaviour of electromagnetic radiation can be described in terms of a wave model and a photon model, and how these models developed over time | RED | AMBER | GREEN |  |
|  | RED | AMBER | GREEN |  |
| Be able to use the equation E = hf, that relates the photon energy to the wave frequency. | RED | AMBER | GREEN |  |
| Understand that the absorption of a photon can result in the emission of a photoelectron. | RED | AMBER | GREEN |  |
| Understand the terms threshold frequency and work function and be able to use the equation hf = φ + 12 mvm2 ax | RED | AMBER | GREEN |  |
| Be able to use the electronvolt (eV) to express small energies | RED | AMBER | GREEN |  |
| Understand how the photoelectric effect provides evidence for the particle nature of electromagnetic radiation | RED | AMBER | GREEN |  |
| Understand atomic line spectra in terms of transitions between discrete energy levels and understand how to calculate the frequency of radiation that could be emitted or absorbed in a transition between energy levels. | RED | AMBER | GREEN |  |