**Little Heath Sixth Form**

**(Subject)** Personal Learning Checklist

**Student Name: ……………………….…………………………………..………**

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| **Unit Name:**  **Working waves** | **Unit Code:**  **G635** |
| *Minimum Target Grade:* | *Aspirational Target Grade:* |

*KEY:* ***Red =*** *with difficulty* ***Amber*** *= not sure* ***Green*** *= yes*

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| **GCSE Re-Cap (Skills and Knowledge)** | **Red** | **Amber** | **Green** |
| * Know the parts of the electromagnetic spectrum |  |  |  |
| * Recall the equation for speed |  |  |  |
| * Know the difference between longitudinal and transverse waves |  |  |  |

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| **Skills** | **Red** | **Amber** | **Green** | **To address this before the exam I will:-** |
| * **Ability to draw wave diagrams and use them to calculate frequency, speed or wavelength.** |  |  |  |  |
| * **Use ray boxes and equipment to measure the refractive index of a variety of blocks.** |  |  |  |  |
| * **Explaining ideas on the way that science works in a new situation** |  |  |  |  |
| * **Be able to work out what questions are actually asking of you** |  |  |  |  |
| * **Communicate effectively with accurate spelling and grammar and show confidence in using subject specific terminology** |  |  |  |  |

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| **Knowledge/Specification (continued)** | **Red** | **Amber** | **Green** | **To address this before the exam I will:-** |
| Describe features that are common to all waves in terms of displacement |  |  |  |  |
| Describe features common to all repeating waves including: Speed, Wavelength, Frequency and periodic time, Phase, Amplitude |  |  |  |  |
| Describe the difference between sine- and square-wave shapes |  |  |  |  |
| Describe the difference in features including:  Transverse and longitudinal displacement  Polarisation  Standing waves in pipes and strings  Musical notes |  |  |  |  |
| Recall and use the equation V = fλ |  |  |  |  |
| Describe polarisation (including methods of polarisation of light, microwaves and radiowaves). |  |  |  |  |
| What is an electromagnetic (EM) wave |  |  |  |  |
| How an EM wave travels |  |  |  |  |
| How EM waves are produced |  |  |  |  |
| Identify the regions or the EM spectrum and know the similarities and difference of:  Speed in vacuum, air and other media  Wavelength  Frequency  Production  Detection  Uses  Properties |  |  |  |  |
| Describe how the spectrum of ‘hot-body’ radiation varies with temperature |  |  |  |  |
| Describe how the total radiation given off by a surface varies with temperature |  |  |  |  |
| Describe how thermal imaging cameras produce images corresponding to surface temperatures |  |  |  |  |
| Explain the application of thermal images:  Detection of disturbed ground  Night vision  Weapon systems  Burglar alarms  Remote sensing satellites  Detecting earthquake survivors  Medicine  Forensics  Engineering |  |  |  |  |
| Outline the advantages of thermal imaging |  |  |  |  |
| Understand and use the terms spatial resolution and thermal resolution |  |  |  |  |
| Know how the ASCII code can be used to convert text to binary code. |  |  |  |  |
| Use the ASCII to encode a short message |  |  |  |  |
| Be able to explain total internal reflection and critical angle by using refraction |  |  |  |  |
| Be able to relate critical angle to refractive index and wave velocity |  |  |  |  |
| know how total internal refraction prevents light from leaking out of optical fibres |  |  |  |  |
| Describe applications of coherent and incoherent optical fibre bundles |  |  |  |  |
| Understand why step-index fibres are coated with glass of lower refractive index |  |  |  |  |
| Explain how the shape of a square wave signal is degraded with multimode fibres and how to overcome this problem |  |  |  |  |
| Signal is detected using a photodiode |  |  |  |  |
| That solid state lasers are used to produce light used in optical fibre communications |  |  |  |  |
| Be able to measure the refractive index of glass |  |  |  |  |
| Be able to measure the critical angle of glass and relate this to the refractive index |  |  |  |  |
| Know how to detect light using a photodiode |  |  |  |  |
| Know the advantages of optical fibres:  Have large information capacity  Low cost  Small cable size  Little cross talk  Little interference  Electrical interference  Large repeater spacing |  |  |  |  |
| Explain the difference between AM and FM transmissions |  |  |  |  |
| Explain how broadband transmission increases the speed of data connection to the internet |  |  |  |  |
| Distinguish between analogue and digital |  |  |  |  |
| Understand and use binary code |  |  |  |  |
| Explain pulse code modulation, analogue to digital conversion, digital to analogue conversion |  |  |  |  |
| Explain how using small cells help increasing network capacity |  |  |  |  |
| Discuss factors which affect base station distribution |  |  |  |  |
| State factors that affect mobile phone signal strength |  |  |  |  |
| know how up-link and down-link apply to mobiles |  |  |  |  |
| Compare advantages and disadvantages of dual band |  |  |  |  |
| Compare the following:  Frequency division multiple access (FDMA)  Time division multiple access (TDMA)  Code division multiple access (CDMA) |  |  |  |  |
| State qualitatively the absorption of X-rays by air, fat, tissue and bone |  |  |  |  |
| Explain how X-ray picture quality can be improved |  |  |  |  |
| Explain how X-ray and γ-ray damage cells through ionisation |  |  |  |  |
| Evaluate the health risks and how these are minimised |  |  |  |  |
| Describe how image-intensifying screens help minimise risks |  |  |  |  |
| Describe how CAT scans are better than X-rays |  |  |  |  |
| Describe the principles of γ-camera to image radioactive tracers administered to the body |  |  |  |  |
| Identify the advantages of technetium-99m as a radioactive teaser |  |  |  |  |
| describe how X-ray and γ-radiations are used therapeutically |  |  |  |  |

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| **REVISION**  **Use the information on this checklist to make revision cards and notes** |

**Grade tracking:**

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| *Grade* | *Date* | *Grade* | *Date* | *Grade* | *Date* |
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| *Grade* | *Date* | *Grade* | *Date* | *Grade* | *Date* |
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*Note: You should discuss this checklist regularly with your subject teacher/mentor*