**Little Heath Sixth Form**

**Biology**

Personal Learning Checklist

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

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| **Unit Name:**  **Investigative and practical skills in A2 Biology** | **Unit Code:**  **BIOL3** |
| *Minimum Target Grade:* | *Aspirational Target Grade:* |

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

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| **Practical skills** | | **Red** | **Amber** | **Green** | **To address this before the exam I will:-** |
| **Practical work carried out in the context of Units 1 and 2 should enable candidates to gain experience of...** | • the use of water baths to change or control temperature |  |  |  |  |
| • the use of buffers to change or control pH |  |  |  |  |
| • producing an appropriate dilution series when provided with stock solutions of reagents. |  |  |  |  |
| • using an optical microscope, preparing temporary mounts, staining and estimating size |  |  |  |  |
| • collection of reliable quantitative data where  – gas is evolved  – colour change takes place  – there are changes in mass or length. |  |  |  |  |
| • using a standard scientific calculator to calculate mean and standard deviation, rate and percentage change |  |  |  |  |
| • plotting data as line graphs, bar charts and histograms |  |  |  |  |
| • plotting data as scatter diagrams and using these to identify correlation. |  |  |  |  |

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

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| **Knowledge/specification content (skills are highlighted in bold)** | | **Red** | **Amber** | **Green** | **To address this before the exam I will:-** |
| 3.3.1 Investigating biological problems involves changing a specific factor, the independent variable, and measuring the changes in the dependent variable that result. | Candidates should be able to:  • use knowledge and understanding from the AS specification to pose scientific questions and define scientific problems |  |  |  |  |
| • identify the independent variable and describe an appropriate method of varying it in such detail that a student starting an AS course could carry out the suggested procedure without further assistance |  |  |  |  |
| • identify other variables that might be expected to exert a significant influence on the results, use knowledge from relevant parts of the AS  specification to explain why, and describe how these would be kept constant |  |  |  |  |
| • where necessary, describe how and explain why appropriate control experiments should be established |  |  |  |  |
| • identify the dependent variable and describe how they would collect a full range of useful quantitative data, measured to an appropriate level of accuracy and precision |  |  |  |  |
| • distinguish between accuracy and reliability and describe precautions needed to obtain valid, accurate and reliable data. |  |  |  |  |
| 3.3.2 Implementing involves the ability to work methodically and safely, demonstrating competence in the required manipulative skills and efficiency in managing time. Raw data should be methodically collected and recorded during the course of the investigation. | Candidates should be able to  • show full regard for safety and the ethical issues involved with the well-being of living organisms and the environment |  |  |  |  |
| • carry out an investigation in a methodical and organised way, demonstrating competence in the required manipulative skills and efficiency in managing time |  |  |  |  |
| • take all measurements to an appropriate level of accuracy and precision |  |  |  |  |
| • collect and present raw data in a suitable table conforming to the conventions specified in the Institute of Biology publication, Biological Nomenclature, Recommendations on Terms, Units and Symbols, 3rd edition (2000) concerning organisation and presentation of units. |  |  |  |  |
| 3.3.3 Raw data may require processing. Processed data should be used to plot graphs that illustrate patterns and trends from which appropriate conclusions may be drawn.  Scientific knowledge from the AS specification should be used to explain these conclusions. | Candidates should be able to  • process data by carrying out appropriate calculations |  |  |  |  |
| • select relevant data to present an effective summary of the results of an investigation and plot this as an appropriate graph conforming to the conventions specified in the Institute of Biology publication, Biological Nomenclature, Recommendations on Terms, Units and Symbols, 3rd edition (2000) concerning organisation and presentation of units |  |  |  |  |
| • describe, concisely but fully, the trends and patterns in data collected, relating these to specific values, quantities and units |  |  |  |  |
| • recognise correlations and causal relationships |  |  |  |  |
| • draw valid conclusions, relating explanations to specific aspects of the data collected and applying biological knowledge and understanding from the AS specification. |  |  |  |  |
| 3.3.4 Limitations are inherent in the material and apparatus used, and procedures adopted.  These limitations should be identified and methods of overcoming them suggested. | Candidates should be able to  • identify the limitations of the material, apparatus and techniques used |  |  |  |  |
| • discuss the effects of these limitations on the reliability and precision of the data and on the conclusions that may be drawn, resolving conflicting evidence |  |  |  |  |
| • suggest realistic ways in which the effect of these limitations may be reduced. |  |  |  |  |

**Grade tracking:**

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