**Little Heath Sixth Form**

**Computing** Personal Learning Checklist

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

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| **Unit Name Computer Components. The Stored Program Concept and the Internet** | **Unit Code: Comp 2** |
| *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** |
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| **Skills** | **Red** | **Amber** | **Green** | **To address this before the exam I will:-** |
| * **Create web pages in HTML using a text based editor** |  |  |  |  |
| * **Create logic circuits** |  |  |  |  |
| * **Simplify logical expressions to enable logic circuits to be build using the minimum number of gates** |  |  |  |  |
| **Knowledge/Specification** |  |  |  |  |
| **Fundamentals of Computer Systems**  **Hardware and Software**  Understand the relationship between hardware and software and be able to define both.  **Classification of Software**  Be aware of how software is classified.  Be able to explain what is meant by system software and application software.  Understand the need for and attributes of different types of software.  **System Software**  Understand the need for, and functions of, system software:  • Operating system software  • Utility programs  • Library programs  • Translator software (Compiler, assembler, interpreter).  **Application Software**  Describe the different types of application software and the criteria for selecting appropriate software for particular purposes.  General purpose application software.  Special purpose application software.  Bespoke application software.  **Generations of Programming Language**  First generation- Machine code  Second generation programming-.Assembly language  Describe machine code language and assembly language.  Be awareof the development of programming languages and the limitations of both machine code and assembly language  Third generation-Imperative high level language  Explain the term imperative high level language and its relationship to first and second generation languages.  Fourth generation-Declarative language  Explain the term declarative programming language and where and why declarative languages are used  **Types of Program Translator**  Define each type of language translator and describe situations  • Assembler where each would be appropriate.  • Compiler  • Interpreter |  |  |  |  |
| **Fundamental Hardware Elements of Computers**  **Logic Gates**  Construct truth tables for the following gates: NOT, AND, OR, XOR, NAND, NOR.  Be familiar with drawing logic diagrams involving one or more of the above gates.  **Boolean Algebra**  Be familiar with the use of De Morgan’s laws to manipulate and simplify simple Boolean expressions. |  |  |  |  |
| **Machine Level Architecture**  **Internal and External Hardware Components of a Computer**  Outline the basic internal components of a computer system.  Understand the need for and means of connection between components.  Processor, main memory, addresses bus, data bus, control bus, I/O controllers and I/O ports, secondary storage, their purpose and how they relate.  Know that external components are called peripherals and an example is secondary storage.  **Functional Characteristics of a Processor**  Understand the concept of addressable memory.  Describe the stored program concept whereby machine code instructions stored in main memory are fetched and executed serially by a processor that performs arithmetic and logical operations.  **Structure and Role of the Processor**  Understand the characteristics of contemporary processors.  Explain the role and operation of a processor and its major components.  • Arithmetic Logic Unit  • Control Unit  • Clock  • General purpose and dedicated registers  Explain the effect of clock speed, word length and bus width on performance.  **Machine code and processor instruction set**  The basic machine code operations of Load, Add, Store.  The Fetch–Execute cycle and the role of registers within it  Explain how the Fetch–Execute cycle is used to execute machine code programs including the stages in the cycle with details of registers used.  Machine code representation in binary and hexadecimal. |  |  |  |  |
| **Hardware Devices**  **Input and Output Devices**  Know the main characteristics of contemporary devices (see the *Teacher Resource Bank*) and understand their principles of operation, including methods of error checking (check digit).  **Secondary Storage Devices**  Explain the need for secondary storage within a computer system, know the main characteristics and understand the principles of operation of contemporary devices  Compare the capacity and speed of access of various media and make a judgement about their suitability for different applications. |  |  |  |  |
| The Structure of the Internet  **The Internet and its Uses**  Understand the structure of the Internet, the role of packet switching and routers  **World Wide Web (WWW) / Intranet / Internet**  Understand the difference between the Internet, the Web and an intranet.  **Uniform Resource Locator (URL)** Describe the term URL in the context of Internetworking.  **Uniform Resource Identifier (URI)** Describe the role of URIs in the context of Internetworking.  **Domain Names and IP Addresses** Explain the terms *domain name* and *IP address*. Describe how domain names are organised.  **Internet registries and Internet registrars** Explain why such services are provided.  **Internet Service Providers (ISP)** Understand the role of an ISP.  **Domain Name Server (DNS)** Understand the purpose of Domain Name Server.  **The Client–Server Model** Be familiar with the client–server model.  **Common Standard Protocols**:  Describe the role of the four layers of the TCP/IP protocol stack, including sockets.  • TCP/IP  • FTP  • HTTP  • TELNET  • POP3, SMTP  • Well-known ports  • Ephemeral ports  • HTTPS  Be familiar with  • Telnet server for remote management of a server  • Web server to retrieve web pages in text form  • E-mail server to read and send e-mail  • FTP client software and an FTP server to transfer files using anonymous and non-anonymous access.  Understand the role of a web browser in retrieving web pages and web page resources and rendering these accordingly. |  |  |  |  |
| **Web page design**  **Web page construction**  Have practical experience of creating simple web pages containing hyperlinks using the tags listed in the *Teacher Resource Bank*.  **HTML & style sheets**  Know that HTML is used for structure only and that style sheets are used for style and layout of web pages |  |  |  |  |
| **Consequences of Uses of Computing**  **Legal and Ethical Issues**  Discuss issues of ownership of information and programs, and the protection of data.  Consider current legal controls which specifically refer to computerised data and programs, and the implications of current legislation (see the *Teacher Resource Bank*).  Hacking.  Consider how digital rights can be managed.  Code of Conduct.  **Economic and Social Issues**  Discuss the social consequences of current uses of computing.  Be aware of emerging technologies and appreciate their potential impact on society.  Robotics:  • What are machines good and bad at, in comparison to humans?  • What can this tell us about the way that the human mind works?  • What can we learn from machines?  • What are the limitations of using machines as tools? |  |  |  |  |

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

**Grade tracking:**

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