Computer Science

Year 7 - Half Term 1 – Using Computers

Prior Learning	This unit teaches all students who come to the school the basics of using computers and how to effectively organise their user areas on the school network. It deals with the Use of passwords, folder structures and the use of Moodle (the school VLE). Those topics have been covered during the first half term of this unit. All what is being studied is designed to build upon principles of KS2 and get all students in the year to be up to the same knowledge and experience standard that is expected by the school and the KS3 curriculum.
What will I learn?	After completing a baseline assessment to establish their entry level grade for the school, in this term the students will be introduced to using a computer in the school and establish the safe and appropriate use of a computer and its network in the school environment. **The key principles covered in the unit during this half term are : logging on, the virtual learning environment (VLE), file management and the effective use of e mail.**
Next Steps	The knowledge covered in the aspects of the unit is used as a secure knowledge base for other units during KS3 such as Networks and Microbit. It also provides a strong foundation of how computer systems work that will be foundation of the KS4 Computer Science option.
Personal Development	Helps students to make informed choices with reference to managing 'risks to Wellbeing' 'Internet Safety' and Careers such as science and medicine, engineering, finance, construction, communication and media, administration and management.
Key vocabulary	Baseline, username, password, internet browser, VLE, sub folder, mapped drive, phishing. Technical, technology, sequence, capacity, logic, access, criteria.
How and when will I be assessed?	The completion of a baseline assessment in the second lesson that establishes their current knowledge of computer science when entering the school and is sued as a foundation to build upon. This unit will be assessed by a variety of written and practical tasks throughout the term averaging out at one per lesson, this will be assessed by either the teacher, the student or one of their peers. The marks for those tasks will be recorded on the front of their unit booklet. Also at the beginning of each unit the students will be given a pre assessment to establish what knowledge they come to the unit with. They will be graded as either having limited, reasonable, good or extensive knowledge. This is then repeated at the half way point of the unit to check for progress.
Resources to use	Every lesson in the units (as well as for the entire year can be accessed on the school VLE (Moodle). This allows students to read ahead, recap with parents or access work if absent. Every resource, worksheet, booklet, video, simulation, link etc that is used in each of the lessons are available for them instantly at first log in to Moodle in September of year 7, giving them a clear and comprehensive venture into EVERY past, present and future lesson for the entire academic year. The URL is : https://vle.cardinalallen.co.uk/course/view.php?id=339
Enrichment opportunities	On Moodle, the challenge cards for each unit are available to access and complete as well as specific 'Stretch and Challenge' resources. Available at: https://vle.cardinalallen.co.uk/course/view.php?id=339 https://vle.cardinalallen.co.uk/course/index.php?categoryid=148

Year 7 - Half Term 2 – Using Computers, Understanding Computers

Prior Learning	The work covered during this half term is a continuation of the Using Computers units that was started back in September of year 7. Those topics have been covered during the first half term of this unit. Prior knowledge from the last half terms is**:** logging on, the virtual learning environment (VLE), file management and the effective use of e mail.
What will I learn?	They will study a theoretical unit entitled 'Understanding Computers' that starts to establish a knowledge of how computer systems work and how computers store data. **Key areas studied are : input and output devices, hardware or software, input, process, storage and outputs, role of the CPU, Fetch, decode and Execute Cycle is, RAM and ROM, permanent storage, magnetic, optical, solid state, Binary.** By this point of the academic year we will not have completed this unit by this half term ending and will therefore continue with the unit after Christmas and into half term 3.
Next Steps	This is then used as a secure knowledge base for other units during KS3 such as Networks and Micro:bit. It also provides a strong foundation of how computer systems work that will be foundation of the KS4 Computer Science option.
Personal Development	Helps students to make informed choices with reference to managing 'risks to Wellbeing' 'Internet Safety' and Careers such as science and medicine, engineering, finance, construction, communication and media, administration and management.
Key vocabulary	Username, password, internet browser, VLE, sub folder, mapped drive, phishing, cloud computing, e safety, cyber bullying, digital footprint, privacy, profile, input, CPU, GHZ, multi core, RAM, ROM, Terabyte, magnetic, optical, solid state, binary. Technical, technology, sequence, capacity, logic, access, criteria.
How and when will I be assessed?	This unit will be assessed by a variety of written and practical tasks throughout the term averaging out at one per lesson, this will be assessed by either the teacher, the student or one of their peers. The marks for those tasks will be recorded on the front of their unit booklet. Also at the beginning of each unit the students will be given a pre assessment to establish what knowledge they come to the unit with. The students will then complete a 40 question controlled test that will be completed at the end of the unit under exam conditions. Verbal feedback will also be given to students in each lesson due to the practical nature of the subjects in places.
Resources to use	Every lesson in the units (as well as for the entire year can be accessed on the school VLE (Moodle). This allows students to read ahead, recap with parents or access work if absent. Every resource, worksheet, booklet, video, simulation, link etc that is used in each of the lessons are available for them instantly at first log in to Moodle in September of year 7, giving them a clear and comprehensive venture into EVERY past, present and future lesson for the entire academic year! The URL is : https://vle.cardinalallen.co.uk/course/view.php?id=339
Enrichment opportunities	On Moodle, the challenge cards for each unit are available to access and complete as well as specific 'Stretch and Challenge' resources. Available at: https://vle.cardinalallen.co.uk/course/view.php?id=339 https://vle.cardinalallen.co.uk/course/index.php?categoryid=148 Other online resources : www.thinkyouknow.co.uk https://www.bbc.co.uk/bitesize/topics/zmpsgk7

Year 7 - Half Term 3 – Understanding Computers

Prior Learning	The work covered this half term is a continuation of the Understanding Computers unit studied in term 2. The key elements studied were : input and output devices, hardware or software, input, process, storage and outputs, role of the CPU, Fetch, decode and Execute Cycle is
What will I learn?	This is a theoretical unit about how computers work. **Students will learn about computer systems, processing, memory, storage, binary and binary arithmetic.** The summative assessment comprises of closed-ended questions. They will learn about RAM and ROM as well as permanent storage. We will look specifically at the three main types of permanent memory (magnetic, optical and solid state) and the advantages / disadvantages of each of them. Once this is completed then they will learn about how computers store data as a series of 1's and 0's called Binary. By this point of the academic year we will not have completed this unit by this half term and will therefore continue with the unit in half term 4 and 5.
Next Steps	The knowledge covered in the aspects of the unit are used as a secure knowledge base for other units during KS3 such as Networks and Microbit. It also provides a strong foundation of how computer systems work that will be foundation of the KS4 Computer Science option.
Personal Development	Helps students to make informed choices with reference to Careers as each unit starts off with a slide that links specific careers to the content studied in the units which are computer repair technician, network engineer, systems administrator, IT sales, network manager and IT buyer.
Key vocabulary	Input, CPU, GHZ, multi core, RAM, ROM, Terabyte, magnetic, optical, solid state, binary, overflow, pixel, resolution. Technical, technology, sequence, capacity, logic, access, criteria.
How and when will I be assessed?	This unit will be assessed by a variety of written and practical tasks throughout the term averaging out at one per lesson, this will be assessed by either the teacher, the student or one of their peers. The marks for those tasks will be recorded on the front of their unit booklet. The students will complete a 40 question controlled test that will be completed at the end of the unit under exam conditions. Verbal feedback will also be given to students in each lesson due to the practical nature of the subjects in places.
Resources to use	Every lesson in the units (as well as for the entire year can be accessed on the school VLE (Moodle). This allows students to read ahead, recap with parents or access work if absent. Every resource, worksheet, booklet, video, simulation, link etc that is used in each of the lessons are available for them instantly at first log in to Moodle in September of year 7, giving them a clear and comprehensive venture into EVERY past, present and future lesson for the entire academic year! The URL is : https://vle.cardinalallen.co.uk/course/view.php?id=339
Enrichment opportunities	On Moodle, the challenge cards for each unit are available to access and complete as well as specific 'Stretch and Challenge' resources. Available at: https://vle.cardinalallen.co.uk/course/view.php?id=339 https://vle.cardinalallen.co.uk/course/index.php?categoryid=148 Other online resources : www.thinkyouknow.co.uk https://www.bbc.co.uk/bitesize/topics/zmpsgk7 https://www.youtube.com/watch?v=hapW36HQqKY

Year 7 - Half Term 4 – Understanding Computers

Prior Learning	The work covered this half term is a continuation of the Understanding Computers unit started last term. What is being studied is designed to build upon principles studied in terms 2 and 3 which were : computer systems, processing, memory, storage, binary and binary arithmetic
What will I learn?	This is a theoretical unit about how computers work. Students will learn about binary and binary arithmetic as well as how bitmap images are stored as binary data. **They will look specifically at how computers store data as a series of 1's and 0's called Binary. Binary arithmetic will be introduced to deepen the students understanding as well as how text and characters are stored as binary as well as the principles of bitmap image storage in binary.**
Next Steps	The knowledge covered in the aspects of the unit are used as a secure knowledge base for other units during KS3 such as Networks and Microbit. It also provides a strong foundation of how computer systems work that will be foundation of the KS4 Computer Science option.
Personal Development	Helps students to make informed choices with reference to Careers as each unit starts off with a slide that links specific careers to the content studied in the units which are computer repair technician, network engineer, systems administrator, IT sales, network manager and IT buyer.
Key vocabulary	Identify, explain, describe, state, convert, binary, overflow, pixel, resolution, bitmap, ASCII, base 10, deanery. Technical, technology, sequence, capacity, logic, access, criteria.
How and when will I be assessed?	This unit will be assessed by a variety of written and practical tasks throughout the term averaging out at one per lesson, this will be assessed by either the teacher, the student or one of their peers. The marks for those tasks will be recorded on the front of their unit booklet. The students will complete a 40 question controlled test that will be completed at the end of the unit under exam conditions. Verbal feedback will also be given to students in each lesson due to the practical nature of the subjects in places.
Resources to use	Every lesson in the units (as well as for the entire year can be accessed on the school VLE (Moodle). This allows students to read ahead, recap with parents or access work if absent. Every resource, worksheet, booklet, video, simulation, link etc that is used in each of the lessons are available for them instantly at first log in to Moodle in September of year 7, giving them a clear and comprehensive venture into EVERY past, present and future lesson for the entire academic year! The URL is : https://vle.cardinalallen.co.uk/course/view.php?id=339 Other online resources : https://www.bbc.co.uk/bitesize/guides/z26rcdm/revision/1
Enrichment opportunities	On Moodle, the challenge cards for each unit are available to access and complete as well as specific 'Stretch and Challenge' resources. Available at: https://vle.cardinalallen.co.uk/course/view.php?id=339 https://vle.cardinalallen.co.uk/course/index.php?categoryid=148 Other online resources : www.thinkyouknow.co.uk https://www.bbc.co.uk/bitesize/topics/zmpsgk7 https://www.youtube.com/watch?v=hapW36HQqKY

Year 7 - Half Term 5 – 'Understanding Computers' and 'Coding In Kodu' Units

Prior Learning	The work covered this half term is a finalisation of the Understanding Computers unit started last term and an introduction to the final unit of year 7 which is called 'Coding In Kodu. What is being studied is designed to build upon principles of KS2 and get all students in the year to be up to the same knowledge and experience standard that is expected by the school and the KS3 curriculum. The unit(s) billd upon the following learned principles : computer systems, processing, memory, storage, binary and binary arithmetic that were studied in terms 3 and 4.
What will I learn?	The Understanding Computers unit has been a theoretical unit of how computer work and has gone into depth on a number of key principles. **The culmination of the unit builds on that covered theory and focussed on the Boolean Logic of And, Or, Not.** The unit is then finalised by completing an end of unit assessment that is sat under exam conditions. The students then receive a grade and feedback which is then acted upon to allow work to be refined. The students are then introduced to the final unit of year 7 called Coding In Kodu. This unit is a practical unit on coding. Through the coding and creation of games students will learn about landscapes, navigation, pathing, scoring and health. All coding tasks are in the unit work booklet that is available by following the link to Moodle that is in the penultimate section of the table. The tasks completed this term will be fallen apples and star hungry.
Next Steps	The knowledge covered in the aspects of the unit are used as a secure knowledge base for other units during KS3 such as Flowol, Microbit and Python. It also provides a strong foundation for programming work that will be foundation of the KS4 Computer Science option.
Personal Development	Helps students to make informed choices with reference to Careers as each unit starts off with a slide that links specific careers to the content studied in the units which are games developer, games tester, app developer, software engineer, front end developer and virtual reality developer. E safety is related to where necessary.
Key vocabulary	Identify, explain, describe, state, convert, binary, overflow, pixel, resolution, bitmap, ASCII, base 10, deanery. World, rules, title, sequence, selection, landscape, navigation path, variable, scoring, object, terrain, first person, speed multiplier. Technical, technology, sequence, capacity, logic, access, criteria.
How and when will I be assessed?	This unit will be assessed by a variety of practical tasks throughout the term averaging out at one per lesson, this will be assessed by either the teacher, the student or one of their peers. The summative assessment comprises of the creation and evidencing of a game as well as submission of a portfolio of evidence. Verbal feedback will also be given to students in each lesson due to the practical nature of the subjects in places.
Resources to use	Every resource, worksheet, booklet, video, simulation, link etc that is used in each of the lessons are available for them instantly at first log in to Moodle in September of year 7, giving them a clear and comprehensive venture into EVERY past, present and future lesson for the entire academic year! The URL is : https://vle.cardinalallen.co.uk/course/view.php?id=339
Enrichment opportunities	Other enrichment activities available at: https://vle.cardinalallen.co.uk/course/index.php?categoryid=148 https://www.kodugamelab.com/ https://www.youtube.com/watch?v=eZ5EVicSOU0 (build your own game)

Year 7 - Half Term 6 – Coding In Kodu

Prior Learning	The work covered this half term is a finalisation of the Understanding Computers unit called 'Coding In Kodu'. What is being studied is designed to build upon principles of what has been studied this year and prior learning relevant to this unit is : logic, sequence, boolean, input, outputs, scoring and debugging studied in terms 3,4 and 5.
What will I learn?	This unit is a practical unit on coding. Through the coding and creation of games **students will learn about landscapes, navigation, pathing, scoring and health**. All coding tasks are in the unit work booklet that is available by following the link to Moodle that is in the penultimate section of the table. **The tasks completed this term will be karting mania, crossy road, pac man, pokemon, pong and then the final unit assessment task.**
Next Steps	The knowledge covered in the aspects of the unit are used as a secure knowledge base for other units during KS3 such as Flowol, Microbit and Python. It also provides a strong foundation for programming work that will be foundation of the KS4 Computer Science option.
Personal Development	Helps students to make informed choices with reference to Careers as each unit starts off with a slide that links specific careers to the content studied in the units which are games developer, games tester, app developer, software engineer, front end developer and virtual reality developer. Online safety is reiterated aswell.
Key vocabulary	Identify, explain, describe, state, world, rules, title, sequence, selection, landscape, navigation path, variable, scoring, object, terrain, first person, speed multiplier. Technical, technology, sequence, capacity, logic, access, criteria.
How and when will I be assessed?	This unit will be assessed by a variety of practical tasks throughout the term averaging out at one per lesson, this will be assessed by either the teacher, the student or one of their peers. The evidence for those tasks will be recorded on the front of their unit booklet. The summative assessment comprises of the creation and evidencing of a game as well as submission of a portfolio of evidence. Verbal feedback will also be given to students in each lesson due to the practical nature of the subjects in places.
Resources to use	Every resource, worksheet, booklet, video, simulation, link etc that is used in each of the lessons are available for them instantly at first log in to Moodle in September of year 7, giving them a clear and comprehensive venture into EVERY past, present and future lesson for the entire academic year! https://vle.cardinalallen.co.uk/course/view.php?id=339
Enrichment opportunities	Other enrichment activities available at: https://vle.cardinalallen.co.uk/course/index.php?categoryid=148 https://www.kodugamelab.com/ https://www.youtube.com/watch?v=eZ5EVicSOU0 (build your own game)

Year 8 - Half Term 1 – 'Coding In Kodu' Unit

Prior Learning	The work covered this half term is an introduction to the final unit of year 7 which is called 'Coding In Kodu. What is being studied is designed to build upon principles of KS2 and get all students in the year to be up to the same knowledge and experience standard that is expected by the school and the KS3 curriculum. The unit(s) build upon the following learned principles : computer systems, processing, memory, storage, binary and binary arithmetic that were studied in terms 5 and 6 of year 7.
What will I learn?	The students are then introduced to their first programming unit called Coding In Kodu. This unit is a practical unit on coding. Through the coding and creation of games students will learn about landscapes, navigation, pathing, scoring and health. All coding tasks are in the unit work booklet that is available by following the link to Moodle that is in the penultimate section of the table. The tasks completed this term will be fallen apples and star hungry.
Next Steps	The knowledge covered in the aspects of the unit are used as a secure knowledge base for other units during KS3 such as Flowol, Microbit and Python. It also provides a strong foundation for programming work that will be foundation of the KS4 Computer Science option.
Personal Development	Helps students to make informed choices with reference to Careers as each unit starts off with a slide that links specific careers to the content studied in the units which are games developer, games tester, app developer, software engineer, front end developer and virtual reality developer. E safety is related to where necessary.
Key vocabulary	Identify, explain, describe, state. World, rules, title, sequence, selection, landscape, navigation path, variable, scoring, object, terrain, first person, speed multiplier. Technical, technology, sequence, capacity, logic, access, criteria.
How and when will I be assessed?	This unit will be assessed by a variety of practical tasks throughout the term averaging out at one per lesson, this will be assessed by either the teacher, the student or one of their peers. The summative assessment comprises of the creation and evidencing of a game as well as submission of a portfolio of evidence. Verbal feedback will also be given to students in each lesson due to the practical nature of the subjects in places.
Resources to use	Every resource, worksheet, booklet, video, simulation, link etc that is used in each of the lessons are available for them instantly at first log in to Moodle in September of year 8, giving them a clear and comprehensive venture into EVERY past, present and future lesson for the entire academic year. The URL is : https://vle.cardinalallen.co.uk/course/view.php?id=339
Enrichment opportunities	Other enrichment activities available at: https://vle.cardinalallen.co.uk/course/index.php?categoryid=148 https://www.kodugamelab.com/ https://www.youtube.com/watch?v=eZ5EVicSOU0 (build your own game)

Year 8 - Half Term 2 – Coding In Kodu

Prior Learning	The work covered this half term is a finalisation of the Understanding Computers unit called 'Coding In Kodu'. What is being studied is designed to build upon principles of what has been studied this year and prior learning relevant to this unit is : logic, sequence, boolean, input, outputs, scoring and debugging studied in terms 3,4 and 5.
What will I learn?	This unit is a practical unit on coding. Through the coding and creation of games **students will learn about landscapes, navigation, pathing, scoring and health**. All coding tasks are in the unit work booklet that is available by following the link to Moodle that is in the penultimate section of the table. **The tasks completed this term will be karting mania, crossy road, pac man, pokemon, pong and then the final unit assessment task.**
Next Steps	The knowledge covered in the aspects of the unit are used as a secure knowledge base for other units during KS3 such as Flowol, Microbit and Python. It also provides a strong foundation for programming work that will be foundation of the KS4 Computer Science option.
Personal Development	Helps students to make informed choices with reference to Careers as each unit starts off with a slide that links specific careers to the content studied in the units which are games developer, games tester, app developer, software engineer, front end developer and virtual reality developer. Online safety is reiterated also.
Key vocabulary	Identify, explain, describe, state, world, rules, title, sequence, selection, landscape, navigation path, variable, scoring, object, terrain, first person, speed multiplier. Technical, technology, sequence, capacity, logic, access, criteria.
How and when will I be assessed?	This unit will be assessed by a variety of practical tasks throughout the term averaging out at one per lesson, this will be assessed by either the teacher, the student or one of their peers. The evidence for those tasks will be recorded on the front of their unit booklet. The summative assessment comprises of the creation and evidencing of a game as well as submission of a portfolio of evidence. Verbal feedback will also be given to students in each lesson due to the practical nature of the subjects in places.
Resources to use	Every resource, worksheet, booklet, video, simulation, link etc that is used in each of the lessons are available for them instantly at first log in to Moodle in September of year 8, giving them a clear and comprehensive venture into EVERY past, present and future lesson for the entire academic year. https://vle.cardinalallen.co.uk/course/view.php?id=339
Enrichment opportunities	Other enrichment activities available at: https://vle.cardinalallen.co.uk/course/index.php?categoryid=148 https://www.kodugamelab.com/ https://www.youtube.com/watch?v=eZ5EVicSOU0 (build your own game)

Year 8 - Half Term 3 – Programming A micro:bit

Prior Learning	Units covered so far at KS3 are : Using computers, Understanding Computers, Coding With Kodu, Control Systems with Flowol and the following topics will be built upon : sequence, input, output, logic, error, variables, programming languages that were studied in year 7 terms 5 and 6 and year 8 terms 1 and 2.
What will I learn?	During this term the students will start the 'Programming A micro:bit' unit. This is a practical unit on coding using a device called a micro:bit. It has been designed to continue bridge the gap between visual and text based programming. They will learn about a range of coding concepts including inputs, outputs, variables, loops, selection, sprites and arrays. They will also be introduced to the use of java Script. The summative assessment comprises of a range of coding tasks. **The key principles covered in the unit during this half term are : inputs and outputs, variables, loops, selection. Process, method, vary, range, select, monitor, component**
Next Steps	The knowledge covered in the aspects of the unit is used as a secure knowledge base for other units during KS3 such as the Programming In Python unit. It also provides a strong foundation for a 'hybrid' text and block programming techniques by the use of Java Script, that will be foundation of the KS4 Computer Science option.
Personal Development	Helps students to make informed choices with reference to Careers as each unit starts off with a slide that links specific careers to the content studied in the units which are software engineer, robotics engineer, automation engineer, Java Script developer, back end developer, systems programmer.
Key vocabulary	Java Script, input, output, string, accelerometer, variable, iteration, for loop, while loop, selection, if/else/else if statements, sprite, array. State, explain, Justify, identify, analyse, dissect.
How and when will I be assessed?	This unit will be assessed by a variety of written and practical tasks throughout the term averaging out at one per lesson, this will be assessed by either the teacher, the student or one of their peers. The marks for those tasks will be recorded on the front of their unit booklet. The summative assessment comprises of open-ended questions and evidencing of the programming and scripts created. Once feedback has been received for the summative assessment students will then be given a lesson to complete any refinements and improve their work and understanding in the unit.
Resources to use	Every resource, worksheet, booklet, video, simulation, link etc that is used in each of the lessons, giving them a clear and comprehensive venture into EVERY past, present and future lesson for the entire academic year! The URL is : https://vle.cardinalallen.co.uk/course/view.php?id=339
Enrichment opportunities	Tasks, visits and resources available at https://makecode.microbit.org/ and https://codecombat.com/ https://vle.cardinalallen.co.uk/course/index.php?categoryid=148 https://www.bbc.co.uk/iplayer/episode/m000cs1y/doctor-who-series-12-1-spyfall-part-1 https://www.bbc.co.uk/iplayer/episode/m000d4tk/doctor-who-series-12-2-spyfall-part-2 https://www.youtube.com/watch?v=7TycxwFmdB0 https://www.youtube.com/watch?v=7DVgXByusEk https://www.youtube.com/user/worldsciencefestival https://www.youtube.com/watch?v=NSAXbsbiid0 https://www.youtube.com/watch?v=BlbQsKpq3Ak https://bletchleypark.org.uk/

Year 8 - Half Term 4 – Programming A Microbit

Prior Learning	Units covered so far at KS3 are : Using computers, Understanding Computers, Coding With Kodu, Control Systems with Flowol and the following topics will be built upon : sequence, input, output, logic, error, variables, programming languages that were studied in year 7 terms 5 and 6 and year 8 terms 1 and 2.
What will I learn?	During this term the students will complete the 'Programming A micro:bit' unit. This is a practical unit on coding using a device called a micro:bit. It has been designed to continue bridge the gap between visual and text based programming. They will learn about a range of coding concepts including inputs, outputs, variables, loops, selection, sprites and arrays. They will also be introduced to the use of java Script. The summative assessment comprises of a range of coding tasks. **The key principles covered in the unit during this half term are : inputs and outputs, variables, loops, selection, sprites, arrays, pins and the assessment. Process, method, vary, range, select, monitor, component**
Next Steps	The knowledge covered in the aspects of the unit is used as a secure knowledge base for other units during KS3 such as the Programming In Python unit. It also provides a strong foundation for a 'hybrid' text and block programming techniques by the use of Java Script, that will be foundation of the KS4 Computer Science option.
Personal Development	Helps students to make informed choices with reference to Careers as each unit starts off with a slide that links specific careers to the content studied in the units which are software engineer, robotics engineer, automation engineer, Java Script developer, back end developer, systems programmer.
Key vocabulary	Java Script, input, output, string, accelerometer, variable, iteration, for loop, while loop, selection, if/else/else if statements, sprite, array. State, explain, Justify, identify, analyse, dissect.
How and when will I be assessed?	This unit will be assessed by a variety of written and practical tasks throughout the term averaging out at one per lesson, this will be assessed by either the teacher, the student or one of their peers. The marks for those tasks will be recorded on the front of their unit booklet. The summative assessment comprises of open-ended questions and evidencing of the programming and scripts created. Once feedback has been received for the summative assessment students will then be given a lesson to complete any refinements and improve their work and understanding in the unit.
Resources to use	Every resource, worksheet, booklet, video, simulation, link etc that is used in each of the lessons, giving them a clear and comprehensive venture into EVERY past, present and future lesson for the entire academic year! The URL is : https://vle.cardinalallen.co.uk/course/view.php?id=339
Enrichment opportunities	Tasks, visits and resources available at https://makecode.microbit.org/ and https://codecombat.com/ https://vle.cardinalallen.co.uk/course/index.php?categoryid=148 https://www.bbc.co.uk/iplayer/episode/m000cs1y/doctor-who-series-12-1-spyfall-part-1 https://www.bbc.co.uk/iplayer/episode/m000d4tk/doctor-who-series-12-2-spyfall-part-2 https://www.youtube.com/watch?v=7TycxwFmdB0 https://www.youtube.com/watch?v=7DVgXByusEk https://www.youtube.com/user/worldsciencefestival https://www.youtube.com/watch?v=NSAXbsbiid0 https://bletchleypark.org.uk/

Year 8 - Half Term 5 – Networks And Encryption

Prior Learning	Units covered so far at KS3 are : Using computers, Understanding Computers, Coding With Kodu, Control Systems with Flowol, Coding A micro:bit and the following topics will be built upon : storage, binary, sequences, protocol, e mail, FDE cycle, processing. Studied in year 7 terms 3,4 and 5.
What will I learn?	During this term the students will start the 'Networks And Encryption' unit. This is a theoretical unit about computer networks. Students will learn about the Internet, connectivity, topologies, network types and encryption. The summative assessment comprises of closed-ended questions that are sat under exam conditions. **The key principles covered in the unit during this half term are : The Internet, connectivity, topologies.**
Next Steps	The knowledge covered in the aspects of the unit is used as a secure knowledge base for other units during KS3 such as the Computer Crime And Cyber Security Unit. It also provides a strong foundation for the KS4 Computer Science option.
Personal Development	Helps students to make informed choices with reference to Careers as each unit starts off with a slide that links specific careers to the content studied in the units which are network engineer, project manager, network manager, cabling specialist, firewall consultant, penetration tester. It deals with Laws such as The Computer Misuse Act and Internet Safety.
Key vocabulary	IP address, packet switching, domain name server (DNS), Hyper Text Transfer protocol (HTTP), Hyper text Mark-up Language (HTML), wide area network, network interface card, bandwidth, star network topology, mesh network topology, switch, client server network, encryption. Comment, framework, technology, output, input, access, expand, capacity, transit, rational, transport, channel, unique, transmit, reverse, file, assemble. State, explain, Justify, identify, analyse, relate, example, understand, understanding,
How and when will I be assessed?	This unit will be assessed by a variety of written and practical tasks throughout the term averaging out at one per lesson, this will be assessed by either the teacher, the student or one of their peers. The marks for those tasks will be recorded on the front of their unit booklet. The summative assessment comprises of closed-ended questions that are sat under exam conditions. Once feedback has been received for the summative assessment students will then be given a lesson to complete any refinements and improve their work and understanding in the unit.
Resources to use	Every resource, worksheet, booklet, video, simulation, link etc that is used in each of the lessons, giving them a clear and comprehensive venture into EVERY past, present and future lesson for the entire academic year! The URL is : https://vle.cardinalallen.co.uk/course/view.php?id=339
Enrichment opportunities	Enrichment activities, visits and tutorials available at: https://vle.cardinalallen.co.uk/course/index.php?categoryid=148 https://www.youtube.com/watch?v=7TycxwFmdB0 https://www.youtube.com/watch?v=7DVgXByusEk https://www.youtube.com/user/worldsciencefestival https://www.youtube.com/watch?v=NSAXbsbiid0 https://www.youtube.com/watch?v=BlbQsKpq3Ak https://bletchleypark.org.uk/

Year 8 - Half Term 6 – Networks And Encryption

Prior Learning	Units covered so far at KS3 are : Using computers, Understanding Computers, Coding With Kodu, Control Systems with Flowol, Coding A micro:bit and the following topics will be built upon : storage, binary, sequences, protocol, e mail, FDE cycle, processing. Studied in year 7 terms 3,4 and 5.
What will I learn?	During this term the students will complete the 'Networks And Encryption' unit. This is a theoretical unit about computer networks. Students will learn about the Internet, connectivity, topologies, network types and encryption. The summative assessment comprises of closed-ended questions that are sat under exam conditions. **The key principles covered in the unit during this half term are : The Internet, connectivity, topologies, network types, encryption, assessment.**
Next Steps	The knowledge covered in the aspects of the unit is used as a secure knowledge base for other units during KS3 such as the Computer Crime And Cyber Security Unit. It also provides a strong foundation for the KS4 Computer Science option.
Personal Development	Helps students to make informed choices with reference to Careers as each unit starts off with a slide that links specific careers to the content studied in the units which are network engineer, project manager, network manager, cabling specialist, firewall consultant, penetration tester. It deals with Laws such as The Computer Misuse Act and Internet Safety.
Key vocabulary	IP address, packet switching, domain name server (DNS), Hyper Text Transfer protocol (HTTP), Hyper text Mark-up Language (HTML), wide area network, network interface card, bandwidth, star network topology, mesh network topology, switch, client server network, encryption. Comment, framework, technology, output, input, access, expand, capacity, transit, rational, transport, channel, unique, transmit, reverse, file, assemble. State, explain, Justify, identify, analyse, relate, example, understand, understanding,
How and when will I be assessed?	This unit will be assessed by a variety of written and practical tasks throughout the term averaging out at one per lesson, this will be assessed by either the teacher, the student or one of their peers. The marks for those tasks will be recorded on the front of their unit booklet. The summative assessment comprises of closed-ended questions that are sat under exam conditions. Once feedback has been received for the summative assessment students will then be given a lesson to complete any refinements and improve their work and understanding in the unit.
Resources to use	Every resource, worksheet, booklet, video, simulation, link etc that is used in each of the lessons, giving them a clear and comprehensive venture into EVERY past, present and future lesson for the entire academic year! The URL is : https://vle.cardinalallen.co.uk/course/view.php?id=339
Enrichment opportunities	Enrichment activities, visits and tutorials available at: https://vle.cardinalallen.co.uk/course/index.php?categoryid=148 https://www.youtube.com/watch?v=7TycxwFmdB0 https://www.youtube.com/watch?v=7DVgXByusEk https://www.youtube.com/user/worldsciencefestival https://www.youtube.com/watch?v=NSAXbsbiid0 https://www.youtube.com/watch?v=BlbQsKpq3Ak https://bletchleypark.org.uk/

Year 9 - Half Term 1 – Control Systems With flowol

Prior Learning	All what is being studied is designed to build upon principles of years 7 and 8 and get all students in the year to be up to the same knowledge and experience standard that is expected by the school and the rest of the KS3 curriculum. Units covered thus far are : Using computers, Understanding Computers, Coding With Kodu and the following topics will be built upon : sequence, input, output, logic, error, variables studied in year 8 terms 5 and 6
What will I learn?	After completing a checkpoint assessment to establish their year 9 entry level grade, in this term the students will be introduced to the 'Control Systems with Flowol' unit. This unit is a practical unit. They will learn about flowcharts, sequencing, sensors, subroutines, actuators and variables. The summative assessment comprises of open-ended questions and evidencing of the flowcharts created. **The key principles covered in the unit during this half term are : Flowcharts, sequencing, Sensors. Process, method, vary, range, select, monitor, component**
Next Steps	The knowledge covered in the aspects of the unit is used as a secure knowledge base for other units during KS3 such as the Micro:bit unit. It also provides a strong foundation for a 'hybrid' text and block programming techniques that will be foundation of the KS4 Computer Science option.
Personal Development	Helps students to make informed choices with reference to Careers as each unit starts off with a slide that links specific careers to the content studied in the units which are systems engineer, robotics engineer, automation engineer, systems analyst, manufacturing engineer, simulation engineer.
Key vocabulary	Flowchart, sequence, process, decision, output, mimic, sensor, loop, automation, subroutine, modular programming, actuator, variable. State, explain, Justify.
How and when will I be assessed?	The completion of the checkpoint assessment in the second lesson establishes their current knowledge of Computer Science is used as a foundation to built upon. This unit will be assessed by a variety of written and practical tasks throughout the term averaging out at one per lesson, this will be assessed by either the teacher, the student or one of their peers. The marks for those tasks will be recorded on the front of their unit booklet. Also at the beginning of each unit the students will be given a pre assessment to establish what knowledge they come to the unit with. The summative assessment comprises of open-ended questions and evidencing of the flowcharts created.
Resources to use	Every resource, worksheet, booklet, video, simulation, link etc that is used in each of the lessons, giving them a clear and comprehensive venture into EVERY past, present and future lesson for the entire academic year. https://vle.cardinalallen.co.uk/course/view.php?id=339
Enrichment opportunities	On Moodle, the challenge cards for each unit are available to access and complete as well as specific 'Stretch and Challenge' resources. Available at: https://www.bbc.co.uk/bitesize/topics/zhy39j6 https://vle.cardinalallen.co.uk/course/index.php?categoryid=148 Other resources: https://code.org/learn https://www.youtube.com/channel/UCKQRjDArruv_vnODuVEBiQQ

Year 9 - Half Term 2 – Control Systems With flowol

Prior Learning	All what is being studied is designed to build upon principles of years 7 and 8 and get all students in the year to be up to the same knowledge and experience standard that is expected by the school and the rest of the KS3 curriculum. Units covered thus far are : Using computers, Understanding Computers, Coding With Kodu and the following topics will be built upon : sequence, input, output, logic, error, variables studied in year 8 terms 5 and 6 as well as the flowol topics covered in year 9 term 1.
What will I learn?	During this term the students will complete the Control Systems With Flowol unit that was started in the first term. This unit is a practical unit. They will learn about flowcharts, sequencing, sensors, subroutines, actuators and variables. The summative assessment comprises of open-ended questions and evidencing of the flowcharts created. **The key principles covered in the unit during this half term are : Flowcharts, sequencing, Sensors, subroutines, actuators, variables. Process, method, vary, range, select, monitor, component**
Next Steps	The knowledge covered in the aspects of the unit is used as a secure knowledge base for other units during KS3 such as the Micro:bit unit. It also provides a strong foundation for a 'hybrid' text and block programming techniques that will be foundation of the KS4 Computer Science option.
Personal Development	Helps students to make informed choices with reference to Careers as each unit starts off with a slide that links specific careers to the content studied in the units which are systems engineer, robotics engineer, automation engineer, systems analyst, manufacturing engineer, simulation engineer. Internet safety is also emphasised in relation to online tutorials.
Key vocabulary	Flowchart, sequence, process, decision, output, mimic, sensor, loop, automation, subroutine, modular programming, actuator, variable. State, explain, Justify.
How and when will I be assessed?	This unit will be assessed by a variety of written and practical tasks throughout the term averaging out at one per lesson, this will be assessed by either the teacher, the student or one of their peers. At the beginning of each unit the students will be given a pre assessment to establish what knowledge they come to the unit with. The summative assessment comprises of open-ended questions and evidencing of the flowcharts created. Once feedback has been received for the summative assessment students will then be given a lesson to complete any refinements and improve their work and understanding in the unit.
Resources to use	Every resource, worksheet, booklet, video, simulation, link etc that is used in each of the lessons, giving them a clear and comprehensive venture into EVERY past, present and future lesson for the entire academic year! https://vle.cardinalallen.co.uk/course/view.php?id=339
Enrichment opportunities	On Moodle, the challenge cards for each unit are available to access and complete as well as specific 'Stretch and Challenge' resources. Available at: https://www.bbc.co.uk/bitesize/topics/zhy39j6 https://vle.cardinalallen.co.uk/course/index.php?categoryid=148 Other resources: https://code.org/learn https://www.youtube.com/channel/UCKQRjDArruv_vnODuVEBiQQ

Year 9 - Half Term 3 – Programming In Python Unit & Digital Graphics Unit	
Prior Learning	Units covered in KS3 so far are : Using computers, Understanding Computers, Coding With Kodu, Flowol, micro:bit, Networks and Encryption, Programming In Python and the following topics will be built upon : sequences, input, output, logic, debugging, variables, Boolean logic, pixels, connection methods, types of graphics, JPEG, BITMAP, VECTOR, audience, purpose, visualisation diagrams, refinement, client briefs. These were all studied at various points between year 7 terms 5 and 6, Creative computing terms 1 and 2 or 4 and 5.
What will I learn?	After the Programming In Python Unit has been completed in lesson 1 of the term followed by a refinement and improvement lesson. A new unit called 'Digital Graphics' is started. Students will learn the differences between bitmap and vector images and how they are stored. They will also learn about and practise a range of different image creation and manipulation techniques. During the unit students will plan, design and create a packaging design and advertising campaign for a new health based children's cereal. **The key principles covered in the unit during this half term are : types of research, types of graphics, vector graphics, bitmap graphics.**
Next Steps	The knowledge covered in the aspects of the Graphics unit provides a strong foundation for variety of creative and graphical manipulation skills that will be suited to the Level 2 creative I media option studied at KS4. It can also be used as a foundation for the Level 3 Digital Graphics BTEC course at Blackpool Sixth in any of the graphic design units.
Personal Development	Helps students to make informed choices with reference to Careers and options as this unit. The careers are : 2D animator, graphic designer, storyboard designer, illustrator, game artist. As well as resilience as Python Solutions are gained in that way. In addition, being safe online is covered as the internet will be needed to gather images.
Key vocabulary	Vector, visualisation, primary research, secondary research, layers, object, pixel, node, grouping, export, file format, audience, bitmap, identify, explain, justify, expand.
How and when will I be assessed?	This unit will be assessed by a variety of written and practical tasks throughout the term averaging out at one per lesson, this will be assessed by either the teacher, the student or one of their peers. The marks for those tasks will be recorded on the front of their unit booklet. The summative assessment for Python comprises of closed-ended questions and a range of and programming tasks. The summative assessment for Graphics will provide you with an opportunity to showcase and evaluate your work as well as answer a range of questions about the unit content and will be sat next half term.
Resources to use	Every resource, worksheet, booklet, video, simulation, link etc that is used in each of the lessons, giving them a clear and comprehensive venture into EVERY past, present and future lesson for the entire academic year! https://vle.cardinalallen.co.uk/course/view.php?id=339
Enrichment opportunities	Additional resources, tutorials and independent tasks available at https://www.bbc.co.uk/bitesize/topics/zhy39j6 https://vle.cardinalallen.co.uk/course/index.php?categoryid=148 https://www.bbc.co.uk/bitesize/guides/zv2v4wx/test https://www.youtube.com/watch?v=hiBAn1exlmc

Year 9 - Half Term 4 – Digital Graphics

Prior Learning	Units covered in KS3 so far are : Using computers, Understanding Computers, Coding With Kodu, Flowol, micro:bit, Networks and Encryption, Programming In Python and the following topics will be built upon : types of graphics, JPEG, BITMAP, VECTOR, audience, purpose, visualisation diagrams, refinement, client briefs studied in Creative Computing terms 1 and 2.
What will I learn?	A new unit called 'Digital Graphics' is was started in the last half term and will now be continued this term. Students will learn the differences between bitmap and vector images and how they are stored. They will also learn about and practise a range of different image creation and manipulation techniques. During the unit students will plan, design and create a packaging design and advertising campaign for a new health based children's cereal. **The key principles covered in the unit during this half term are : packaging plan, packaging creation, advertising campaign and the summative assessment.**
Next Steps	The knowledge covered in the aspects of the Graphics unit provides a strong foundation for variety of creative and graphical manipulation skills that will be suited to the Level 2 creative I media option studied at KS4. It can also be used as a foundation for the Level 3 Digital Graphics BTEC course at Blackpool Sixth in any of the graphic based units.
Personal Development	Helps students to make informed choices with reference to Careers and options as this unit. The careers are : 2D animator, graphic designer, storyboard designer, illustrator, game artist. In addition, being safe online is covered as the internet will be needed to gather images as well as understanding about Law in relation to copyright.
Key vocabulary	Vector, visualisation, primary research, secondary research, layers, object, pixel, node, grouping, export, file format, audience, bitmap, identify, explain, justify, expand.
How and when will I be assessed?	This unit will be assessed by a variety of written and practical tasks throughout the term averaging out at one per lesson, this will be assessed by either the teacher, the student or one of their peers. The marks for those tasks will be recorded on the front of their unit booklet. The summative assessment at the end of the units will provide you with an opportunity to showcase and evaluate your work as well as answer a range of questions about the unit content and will be sat at the end of the term followed by a refinement and improvement lesson.
Resources to use	Every resource, worksheet, booklet, video, simulation, link etc that is used in each of the lessons, giving them a clear and comprehensive venture into EVERY past, present and future lesson for the entire academic year at https://vle.cardinalallen.co.uk/course/view.php?id=339
Enrichment opportunities	On Moodle, the challenge cards for each unit are available to access and complete as well as specific 'Stretch and Challenge' resources. Available at: https://vle.cardinalallen.co.uk/course/index.php?categoryid=148 https://www.youtube.com/watch?v=hiBAn1exlmc https://www.youtube.com/watch?v=YNlQDfBXV3w https://www.youtube.com/watch?v=YqQx75OPRa0&t=4s https://www.befunky.com/features/graphic-designer/

Year 9 - Half Term 5 – Computer Crime And Cyber Security

Prior Learning	Units covered in KS3 so far are : Using computers, Understanding Computers in year 7 terms 1,2,3,4, Coding With Kodu year 7 term 5,6, Flowol year 8 terms 1,2, micro:bit in year 8 term 3,4, Networks and Encryption, Programming In Python, Digital Graphics in year 9 terms 1 to 4 and the following topics will be built upon : internet connection methods, dangers of e mail, viruses, hacking, digital footprints, e presence.
What will I learn?	This is a theoretical unit about and students will learn about network security, social engineering, viruses, malware, hacking, firewalls and the Computer Misuse Act. **The key principles covered in the unit during this half term are : network security, social engineering, hacking and firewalls.**
Next Steps	The knowledge covered in this unit provides a good foundation for variety of skill and knowledge that will be suited to the GCSE Computer Science option offered at KS4. It can also be used as a foundation for the A Level computer Science course at Blackpool Sixth.
Personal Development	Helps students to make informed choices with reference to Careers and options as this unit (like all others) starts off with a slide that links specific careers to the content studied in the units **(this is a common theme in ALL KS3 units)** Student will also be taught internet safety and enable pupils to recognise online and offline risks to their well-being as well as Law and the legal system in relation to acts of law broken by computer crime.
Key vocabulary	Encryption, blagging, shoulder surfing, pharming, phishing, hacking, black hat hacker, brute force attack, denial of service, SQL injection, virus, worm, trojan horse identify, explain, justify, expand.
How and when will I be assessed?	This unit will be assessed by a variety of written and practical tasks throughout the term averaging out at one per lesson, this will be assessed by either the teacher, the student or one of their peers. The marks for those tasks will be recorded on the front of their unit booklet. The summative assessment comprises of a range of closed-ended questions. This will then be followed by a refinement and improvement lesson in light of final feedback.
Resources to use	Every resource, worksheet, booklet, video, simulation, link etc that is used in each of the lessons, giving them a clear and comprehensive venture into EVERY past, present and future lesson for the entire academic year! https://vle.cardinalallen.co.uk/course/view.php?id=339
Enrichment opportunities	Enrichment opportunities with videos, tutorials and activities available at: https://www.bbc.co.uk/bitesize/topics/zhy39j6 https://vle.cardinalallen.co.uk/course/index.php?categoryid=148 https://www.bbc.co.uk/bitesize/guides/zycm97h/revision/7 https://youthfed.org.uk/cyber-security/# https://www.youtube.com/watch?v=_GzE99AmAQU

Year 9 - Half Term 6 – Computer Crime And Cyber Security

Prior Learning	Units covered in KS3 so far are : Using computers, Understanding Computers in year 7 terms 1,2,3,4, Coding With Kodu year 7 term 5,6, Flowol year 8 terms 1,2, micro:bit in year 8 term 3,4, Networks and Encryption, Programming In Python, Digital Graphics in year 9 terms 1 to 4 and the following topics will be built upon : internet connection methods, dangers of e mail, viruses, hacking, digital footprints, e presence.
What will I learn?	This is a theoretical unit about and students will learn about network security, social engineering, viruses, malware, hacking, firewalls and the Computer Misuse Act. **The key principles covered in the unit during this half term are : network security, social engineering, hacking and firewalls.**
Next Steps	The knowledge covered in this unit provides a good foundation for variety of skill and knowledge that will be suited to the GCSE Computer Science option offered at KS4. It can also be used as a foundation for the A Level computer Science course at Blackpool Sixth.
Personal Development	Helps students to make informed choices with reference to Careers and options as this unit (like all others) starts off with a slide that links specific careers to the content studied in the units **(this is a common theme in ALL KS3 units)** Student will also be taught internet safety and enable pupils to recognise online and offline risks to their well-being as well as Law and the legal system in relation to acts of law broken by computer crime.
Key vocabulary	Encryption, blagging, shoulder surfing, pharming, phishing, hacking, black hat hacker, brute force attack, denial of service, SQL injection, virus, worm, trojan horse identify, explain, justify, expand.
How and when will I be assessed?	This unit will be assessed by a variety of written and practical tasks throughout the term averaging out at one per lesson, this will be assessed by either the teacher, the student or one of their peers. The marks for those tasks will be recorded on the front of their unit booklet. The summative assessment comprises of a range of closed-ended questions. This will then be followed by a refinement and improvement lesson in light of final feedback.
Resources to use	Every resource, worksheet, booklet, video, simulation, link etc that is used in each of the lessons, giving them a clear and comprehensive venture into EVERY past, present and future lesson for the entire academic year! https://vle.cardinalallen.co.uk/course/view.php?id=339
Enrichment opportunities	Enrichment opportunities with videos, tutorials and activities available at: https://www.bbc.co.uk/bitesize/topics/zhy39j6 https://vle.cardinalallen.co.uk/course/index.php?categoryid=148 https://www.bbc.co.uk/bitesize/guides/zycm97h/revision/7 https://youthfed.org.uk/cyber-security/# https://www.youtube.com/watch?v=_GzE99AmAQU

Year 10 - Half Term 1 – Systems architecture, memory and storage

Prior Learning	In the first and second half term of Year 7, pupils completed an 'Understanding Computers' unit in which they studied about the internal components that make up a computer. The purpose of the CPU and stage of the Fetch Execute Cycle, the purpose of multi-core professors and how they affect performance. The differences between RAM and ROM, how they work and how the amount affects performance. Pupils also studied why computer storage is required and different storage methods.
What will I learn?	- The purpose of the CPU - The role and operation of CPU registers used in the Von Neumann architecture - The CPU components and their function: ALU (Arithmetic Logic Unit), CU (Control Unit), Cache - The function of the CPU as fetch and execute instructions stored in memory - How common characteristics of CPUs affect their performance: clock speed, cache size, number of cores - The purpose and examples of embedded systems - The difference between RAM and ROM - The purpose RAM and ROM in a computer system - Why virtual memory is required - The need for secondary storage including optical, magnetic and solid state storage - The data capacity of storage devices and how to calculate data capacity requirements - How to evaluate suitable storage devices and storage media for a given application using the following characteristics: capacity, speed, portability, durability, reliability, cost
Next Steps	Should students want to progress further in Computer Science, Blackpool Sixth Form offers an A Level in Computer Science which builds upon and follows a similar structure to the GCSE course. Blackpool and the Fylde College offers a Diploma in Computing with Programming, Games Development & Cyber Security, three days would be spent at college with one day on a relevant industry placement.
Personal Development	This unit provides the knowledge that will be required in a range of computer science related career paths including networking, system security, software development and web technologies.
Key vocabulary (AWL highlighted)	CPU, fetch, decode, execute, program counter (PC), memory address register (MAR), memory data register (MDR), Control Unit, Arithmetic-Logic Unit (ALU), accumulator, instructions, embedded, memory, clock speed, cache, core, RAM, ROM, virtual memory, flash memory, input devices, output devices, secondary storage, optical, magnetic, solid state, pits, lands, capacity, speed, portability, durability, reliability, <mark>analyse, concept, define, indicate, conclude, brief</mark>
How and when will I be assessed?	Formative – weekly GCSE style exam questions Summative – End of unit assessment
Resources to use	CACHS Moodle – Computer Science https://vle.cardinalallen.co.uk/course/view.php?id=2061 GCSE OCR J277 Computer Science Videos https://www.youtube.com/playlist?list=PLCiOXwirraUAEhj4TUjMxYm4593B2dUPF
Enrichment opportunities	Take a look inside your computer, build a computer, use a website such as https://www.scan.co.uk/ to design your own custom computer

Year 10 - Half Term 2 – Unit 6 Programming + Practical Programming

Prior Learning	In the first three half terms of Year 9, pupils completed a 'Programming in Python' unit in which they studied the process of developing programs, the importance of writing correct syntax, how to formulate simple algorithms and debug the programs they have written. Programming concepts covered in the unit include inputs, outputs, datatypes arithmetic operators, selection, loops, lists, functions, searching and sorting. Pupils will have also programmed a lightshow using a Neopixel.
What will I learn?	The units will be taught alongside each other. Unit 6 Programming: ▪ How to identify and use variable types integer, real, Boolean, character, string and constants ▪ Why it is important to use meaningful identifier names in variables ▪ How to use arithmetic operations including mod and div and how to generate random numbers ▪ How to write pseudocode and create flowchart diagrams to create solutions which involve the use of sequence, selection and iteration ▪ How to use nested selection and iteration statements ▪ How to use Boolean operations NOT, AND and OR within conditions for iterative and selection structures Practical Programming: • How to use basic programming structures of sequence, selection and iteration • How to write, test and debug programs to solve simple problems • How to write error-free, well documented programs
Next Steps	Pupils must be able to apply the practical knowledge gained in this unit to a practical programming scenario which they will undertake during the fourth half term of the year. Should students want to progress further in Computer Science, Blackpool Sixth Form offers an A Level in Computer Science which builds upon and follows a similar structure to the GCSE course. Blackpool and the Fylde College offers a Diploma in Computing with Programming, Games Development & Cyber Security, three days would be spent at college with one day on a relevant industry placement.
Personal Development	This unit provides the knowledge that will be required in a range of computer science related career paths including software engineer, robotics engineer, automation engineer, back end developer and systems programmer.
Key vocabulary (AWL highlighted)	Data type, integer, real, float, Boolean, character, string, variable, constant, concatenation assignment, iteration, selection, flow diagram, pseudocode, arithmetic operations, Boolean operations, sequence, selection, iteration, random, syntax, assignment statement, round, syntax error, logic error, debug, analyse, concept, define, indicate, conclude, brief
How and when will I be assessed?	Formative – weekly GCSE style exam questions and programming tasks Summative – End of unit assessment
Resources to use	CACHS Moodle – Computer Science https://vle.cardinalallen.co.uk/course/view.php?id=2061 GCSE OCR J277 Computer Science Videos https://www.youtube.com/playlist?list=PLCiOXwirraUAEhj4TUjMxYm4593B2dUPF
Enrichment opportunities	Complete the online Python course: https://www.codecademy.com/learn/learn-python

Year 10 - Half Term 3 – Unit 6 Programming + Practical Programming

Prior Learning	In the first three half terms of Year 9, pupils completed a 'Programming in Python' unit in which they studied the process of developing programs, the importance of writing correct syntax, how to formulate simple algorithms and debug the programs they have written. Programming concepts covered in the unit include inputs, outputs, datatypes arithmetic operators, selection, loops, lists, functions, searching and sorting. Pupils will have also programmed a lightshow using a Neopixel.
What will I learn?	These units will be taught alongside each other in preparation for completion of the practical programming project. Unit 6 Programming: - What is meant by a data structure and why they are used - How to use one and two dimensional arrays in the design of solutions to simple problems - How to use simple functions and procedures that return values to the calling program - How to read from and write to a text files Practical Programming: - How to use basic programming structures of sequence, selection and iteration - How to use a regular expression to validate an input - How to create, manipulate and interrogate one and two dimensional lists - How to read from, write to and append simple text files - Write, test and debug programs to solve simple problems - How to use modular programming techniques to break down a problem into its component parts and write well-structured programs using separate functions called from a main program
Next Steps	Pupils must be able to apply the practical knowledge gained in this unit to a practical programming scenario which they will undertake during the fourth half term of the year. Should students want to progress further in Computer Science, Blackpool Sixth Form offers an A Level in Computer Science which builds upon and follows a similar structure to the GCSE course. Blackpool and the Fylde College offers a Diploma in Computing with Programming, Games Development & Cyber Security, three days would be spent at college with one day on a relevant industry placement.
Personal Development	This unit provides the knowledge that will be required in a range of computer science related career paths including software engineer, robotics engineer, automation engineer, back end developer and systems programmer.
Key vocabulary (AWL highlighted)	Data structure, array, record, file, subroutine, procedure, function, parameter, return value, built-in function, scope, global variable, local variable, regular expression, list, two-dimensional list, text file, call, argument, parameter, analyse, concept, define, indicate, conclude, brief
How and when will I be assessed?	Formative – weekly GCSE style exam questions and programming tasks Summative – End of unit assessment
Resources to use	CACHS Moodle – Computer Science https://vle.cardinalallen.co.uk/course/view.php?id=2061 GCSE OCR J277 Computer Science Videos https://www.youtube.com/playlist?list=PLCiOXwirraUAEhj4TUjMxYm4593B2dUPF
Enrichment opportunities	Complete the online Python course: https://www.codecademy.com/learn/learn-python

Year 10 - Half Term 4 – Practical Programming Task (20 hours)

Prior Learning	In the previous two unit's pupils studied the theory and practical elements required to enable them to complete the practical programming task. Pupils studied how to write, test and debug programs that include the use of; sequence, selection, iteration, validation, one and two dimensional lists, reading and writing to text files and functions and procedures that return values.
What will I learn?	The practical programming task will provide you with an opportunity to demonstrate the skills and knowledge which you have acquired in previous units of study. You will be required to plan, code, test and evaluate a solution to a set problem. Skills and knowledge which you will be required to demonstrate include: ▪ The use variables, operators, inputs, outputs and assignments ▪ The use programming constructs including: Sequence; Selection; Iteration ▪ The use of loops including count and condition controlled loops ▪ The use of different types of data, including Boolean, string, integer and real ▪ The use of one and two dimensional lists ▪ The use of functions to create structured code ▪ The design of suitable algorithms ▪ The selection of suitable programming techniques ▪ The testing and refinement of code ▪ The annotation of code ▪ The use of a systematic approach to solving a problem ▪ The production of a report covering all aspects of the task ▪ Though testing of the solution and the correct use of specialist terms
Next Steps	This unit underpins the Algorithms unit that pupils will complete in the first term of Year 11. Should students want to progress further in Computer Science, Blackpool Sixth Form offers an A Level in Computer Science which builds upon and follows a similar structure to the GCSE course. Blackpool and the Fylde College offers a Diploma in Computing with Programming, Games Development & Cyber Security, three days would be spent at college with one day on a relevant industry placement.
Personal Development	This unit provides the knowledge that will be required in a range of computer science related career paths including software engineer, robotics engineer, automation engineer, back end developer and systems programmer.
Key vocabulary (AWL highlighted)	Data type, integer, real, float, Boolean, character, string, variable, constant, concatenation, iteration, selection, flow diagram, pseudocode, arithmetic operations, Boolean operations, sequence, selection, iteration, random, syntax, assignment statement, round, syntax error, logic error, debug,, data structure, array, record, file, subroutine, procedure, function, parameter, return value, built-in function, scope, global variable, local variable, regular expression, list, two-dimensional list, text file, call, argument, parameter, <mark>analyse, concept, define, indicate, conclude, brief</mark>
How and when will I be assessed?	A separate mark will be awarded for each of the stages of planning, design, development and testing alongside an overall grade.
Resources to use	CACHS Moodle – Computer Science https://vle.cardinalallen.co.uk/course/view.php?id=2061 GCSE OCR J277 Computer Science Videos https://www.youtube.com/playlist?list=PLCiOXwirraUAEhj4TUjMxYm4593B2dUPF
Enrichment opportunities	Complete the online Python course: https://www.codecademy.com/learn/learn-python

Year 10 - Half Term 5 – Unit 2 Wired and wireless networks

Prior Learning	In the fifth and sixth half term of Year 8, pupils completed a 'Networks and Encryption' unit in which they studied the differences between a LAN (Local Area Network) and a WAN (Wide Area Network) and the benefits and drawbacks of wired and wireless network. The different cables that can be used to connect computers and what bandwidth is and how it affects the rate that data is transferred. Pupils also studied the hardware required for creating a network, the advantages and disadvantages of different network topologies and the differences between a client-server and peer-to-peer networks.
What will I learn?	- The differences between a local area network and a wide area network - The advantages of networking stand-alone computers into a local area network - The different roles of computers in a client-server and a peer-to-peer network - The advantages and disadvantages of star and mesh network topologies - The speeds of different transmission media - What hardware is needed to connect to the Internet including routers and switches - The need for IP addressing of resources on the Internet and how this can be facilitated by the role of DNS servers - The different layers in the TCP/IP protocol stack and the protocols used at each stage - How Wi-Fi frequencies and channels affect connectivity and transmission - The concept of encryption, hosting and Cloud services - About the need for network policies such as acceptable use, disaster recovery, backup and archiving
Next Steps	Should students want to progress further in Computer Science, Blackpool Sixth Form offers an A Level in Computer Science, this course covers the TCP/IP Stack and Protocol Layering in more detail. Blackpool and the Fylde College offers a Diploma in Computing with Programming, Games Development & Cyber Security, three days would be spent at college with one day on a relevant industry placement.
Personal Development	This unit provides the knowledge that will be required in a range of computer science related career paths including network engineer, project manager, network manager, firewall consultant and penetration tester.
Key vocabulary (AWL highlighted)	LAN, WAN, topology, star, mesh, peer-to-peer, client-server, hub, switch, router, wireless access point, NIC, MAC address, packet, protocol, layer, encryption, hosting, Cloud, Ethernet, frequency, channels, WAP, Internet, broadband, www, http, https, FTP, POP, IMAP, SMTP, TCP, IP addressing, domain name, DNS server, analyse, concept, define, indicate, conclude, brief
How and when will I be assessed?	Formative – weekly GCSE style exam questions Summative – End of unit assessment
Resources to use	CACHS Moodle – Computer Science https://vle.cardinalallen.co.uk/course/view.php?id=2061 GCSE OCR J277 Computer Science Videos https://www.youtube.com/playlist?list=PLCiOXwirraUAEhj4TUjMxYm4593B2dUPF
Enrichment opportunities	Netflix Documentaries: https://www.rasmussen.edu/degrees/technology/blog/technology-documentaries-on-netflix/

Year 10 - Half Term 6 – Unit 3 Systems software and security

Prior Learning	In the sixth half term of Year 9, pupils completed a 'Computer Crime and Cyber Security' unit in which they studied the use of user access levels and passwords to secure network accounts and how to decrypt a range of encrypted words using a range of shift keys. What social engineering is and what measures can be taken to prevent against these types of attacks. Pupils also studied what malware is and differences between a virus, worm and Trojan horse and what precautions should be taken to help prevent against these types of attacks. At the end of the unit pupils studied the purpose of the Computer Misuse Act, its main offences and possible punishments for breaking them.
What will I learn?	▪ About some of the threats posed to networks, including malware, phishing, brute force attacks, denial of service attacks, data interception and theft and poor network policies ▪ What is meant by a social engineering attack and how to keep data safe from phishing attacks ▪ How to prevent network vulnerabilities and how to keep data safe from hackers including anti-malware software, firewalls, user access levels, passwords, penetration testing, network forensics and network policies and encryption ▪ What is meant by a Denial of Service attack, a brute force attack and SQL injection ▪ The functions of an operating system: user interface, memory management, multi-tasking, peripheral management, user, file management and multi-tasking ▪ The purpose of utility system software: encryption software, defragmentation, data compression and different types of backup (full and incremental) ▪ Why increasing the length of an encryption key increases the strength of encryption
Next Steps	Should students want to progress further in Computer Science, Blackpool Sixth Form offers an A Level in Computer Science. As part of the course pupils will cover the use of proxies and learn about a range of more advanced encryption techniques.
Personal Development	This unit provides the knowledge that will be required in a range of related career paths including computer forensics, IT security specialist, cyber intelligence officer
Key vocabulary (AWL highlighted)	Malware, phishing, brute force attack, denial of service attack, data interception, SQL injection, network policy, penetration testing, network forensics, firewall, user access level, operating system, user interface, memory management, multi-tasking, peripheral management, interrupt, defragmentation, data compression, symmetric encryption, asymmetric encryption, private key, public key, cypher text, plaintext, full backup, incremental backup, <mark>analyse, concept, define, indicate, conclude, brief</mark>
How and when will I be assessed?	Formative – weekly GCSE style exam questions Summative – End of unit assessment
Resources to use	CACHS Moodle – Computer Science https://vle.cardinalallen.co.uk/course/view.php?id=2061 GCSE OCR J277 Computer Science Videos https://www.youtube.com/playlist?list=PLCiOXwirraUAEhj4TUjMxYm4593B2dUPF
Enrichment opportunities	Take part in the online Cyber Security Challenge UK https://www.cybersecuritychallenge.org.uk/resources/students

Year 11 - Half Term 1 - Unit 4 Ethical, legal, cultural and environmental Concerns and Unit 5 Algorithms

Prior Learning	Unit 4: In the sixth half term of Year 9, as part of the 'Computer Crime and Cyber Security' unit pupils studied the purpose of the Computer Misuse Act, its main offences and possible punishments for breaking them. Unit 5: The concept of computation thinking is embedded throughout the whole Computer Science curriculum. As part of the 'Programming in Python' which pupils studied in the first three half terms of Year 9 they programmed a number of search and sort algorithms including a binary and linear search and a bubble and insertion sort.
What will I learn?	Unit 4 - Some of the ethical, legal, cultural and environmental issues surrounding the use of computers - The differences between open source and proprietary software and the advantages of each - The clauses of the Data Protection Act and Computer Misuse Act and give examples of situations in which they are relevant - The impact of and issues related to the use of computers in society Unit 5 - What is meant by the terms; algorithm, abstraction and decomposition - The sequence in which items in a sorted list will be examined in a linear and binary search and the advantages and disadvantages of each search type - How a bubble sort works and how to show the state of a list at a given point in a bubble sort - How a merge sort and an insertion sort work and the advantages they have over a bubble sort - How to trace through a simple flow diagram or pseudocode algorithm to determine the output
Next Steps	Should students want to progress further in Computer Science, Blackpool Sixth Form offers an A Level in Computer Science, this course covers censorship and the Internet and the measures and methods to determine the efficiency of different algorithms.
Personal Development	This unit provides the knowledge that will be required in a range of computer science related career paths including project manager, network manager, back end developer and systems programmer.
Key vocabulary (AWL highlighted)	Unit 4: Artificial Intelligence, ethical, cultural, stakeholders, privacy, impact, open source, proprietary, Data Protection Act, the Computer Misuse Act, the Copyright, Designs and Patents Act, Freedom of Information Act. Creative Common Unit 5: Abstraction, decomposition, algorithm, binary search, linear search, bubble sort, merge sort, insertion sort, pseudocode, flow diagram, trace table Analyse, Concept, Define, Indicate, Conclude
How and when will I be assessed?	Formative – weekly GCSE style exam questions Summative – End of unit assessment
Resources to use	CACHS Moodle – Computer Science https://vle.cardinalallen.co.uk/course/view.php?id=2061 GCSE OCR J276 Computer Science Videos https://www.youtube.com/playlist?list=PLCiOXwirraUAEhj4TUjMxYm4593B2dUPF
Enrichment opportunities	Complete some of the tasks in the 'Little Book of Algorithms' by William Lau Available to download: http://www.mrlaulearning.com/2019/04/LBOA.html

Year 11 - Half Term 2 – Unit 7 Logic and languages

Prior Learning	In the first and second half term of Year 7, as part of the 'Understanding Computers' unit pupils studied Boolean logic, how to create logic circuits and trace tables using AND, OR, NOT logic gates and how to create logic diagrams that use a combination of two gates. In year 9 during the first three half terms, as part of the 'Programming in Python Unit' pupils studied and experienced the importance of writing the correct syntax, the differences between the three mains types of programming errors (Syntax, Logic and Run Time) and how to test and debug programs.
What will I learn?	- To recognise the symbols used to represent NOT, AND OR, NAND, NOR and XOR logic gates - To complete truth tables that use the above logic gates and to draw logic diagrams from a given written logic statement - To describe some validation checks that can be applied to data and to write programs that apply these checks - How to select test data that covers normal (typical), boundary (extreme) and erroneous data - Examples of high-level and low-level languages and the advantages of each - The differences between a compiler, interpreter and assembler - When it might be appropriate to use a low-level language and when it would be appropriate to use a compiler and interpreter - How to detect and correct errors in simple algorithms
Next Steps	Should students want to progress further in Computer Science, Blackpool Sixth Form offers an A Level in Computer Science, this course covers the use of Karnaugh maps to simplify Boolean expressions and the logic associated with D type flip flops, half and full adders..
Personal Development	This unit provides the knowledge that will be required in a range of computer science related career paths including project manager, network manager, back end developer and systems programmer.
Key vocabulary (AWL highlighted)	Binary, logic gate, NOT, AND, OR, NAND, NOR, XOR, truth table, logic circuit, logic statement, compiler, interpreter, assembler, high level language, low level language, assembly language, source code, object code, bytecode, machine code, machine independence., validation, verification, authentication, syntax errors, logic errors, runtime errors, , trace table, dry run, valid data, invalid data, boundary data, analyse, concept, define, indicate, conclude
How and when will I be assessed?	Formative – weekly GCSE style exam questions Summative – End of unit assessment
Resources to use	CACHS Moodle – Computer Science https://vle.cardinalallen.co.uk/course/view.php?id=2061 GCSE OCR J276 Computer Science Videos https://www.youtube.com/playlist?list=PLCiOXwirraUAEhj4TUjMxYm4593B2dUPF
Enrichment opportunities	Complete some additional research into the uses of the following gates; XOR gate, NAND gate, NOR gate, XNOR gate.

Year 11 - Half Term 3 – Unit 8 Data representation

Prior Learning	In the first and second half term of Year 7, as part of the 'Understanding Computers' unit pupils studied what binary number are, how to convert numbers to binary and vice versa, how to add binary numbers, how to identify even and odd binary numbers and how text is represented using binary numbers. The representation of graphics was studied in the above unit and in the Year 9 unit 'Digital Graphics' which was studied during the fourth and fifth half term. The content covered included how computers use pixels and binary to store images, why images with more bits can include more colours and how the size and colour depth of an image can affect its file size. Pupils also studied how sound is represented in the Creative Computing unit 'Sound Editing' which was studied for three half terms in either Year 7 or 8.
What will I learn?	- Why all data needs to be converted to binary before it can be processed - How to convert positive denary whole numbers (0-255) into 8-bit binary numbers and vice versa and how to add two binary numbers and explain what overflow errors are - What a check digit is and how to calculate one - Why hexadecimal numbers are used to represent binary data and how to convert between binary and hexadecimal - How binary codes are used to represent characters and the relationship between the number of bits per character and the number of characters which can be represented - How images are represented as pixels in binary and the effect that colour depth and resolution has on the file size of an image - How sounds are sampled and stored in digital form and how sampling intervals and other considerations affect the quality and size of a sound - What compression is, why it is required and how different compression techniques work
Next Steps	Should students want to progress further in Computer Science, Blackpool Sixth Form offers an A Level in Computer Science, this course covers run length encoding and dictionary coding for lossless compression, subtraction of binary numbers and representation and normalisation of floating point numbers in binary.
Personal Development	This unit provides the knowledge that will be required in a range of computer science related career paths including networking, system security, software development and web technologies.
Key vocabulary (AWL highlighted)	Bit, nibble, byte, kilobyte, megabyte, gigabyte, terabyte, denary, overflow, hexadecimal, character set, ASCII, Unicode, character set, check digit, shift, metadata, pixel, colour depth, resolution, sound sampling, playback, lossy, lossless, compression. analyse, concept, define, indicate, conclude
How and when will I be assessed?	Formative – weekly GCSE style exam questions Summative – End of unit assessment
Resources to use	CACHS Moodle – Computer Science https://vle.cardinalallen.co.uk/course/view.php?id=2061 GCSE OCR J276 Computer Science Videos https://www.youtube.com/playlist?list=PLCiOXwirraUAEhj4TUjMxYm4593B2dUPF
Enrichment opportunities	Research some of the concepts and theory covered in A-Level Computer Science including; Nyquist theorem, the compression techniques of 'run length encoding' and dictionary-based methods