

Curriculum Overview Intent, Implementation and Impact 2019-20

Subject OCR Computer Science

INTENT:
Aims for year group/key stage: Skills ready (Programming, logic, life cycle planning, rich content digested/retained)
Students will understand, be able to: More difficult sections of Networking, CPU architecture in paper 1 (identified as key areas nationally by pixl), writing algorithms/flow charts, planning answers (pseudo code), procedural programming (function development)
Students will achieve through this curriculum: Skills and knowledge for both paper 1 and paper 2.
<p>School Virtues addressed by: Leadership within the class aspiring (team leaders in all virtues)</p> <p>Ambition: Competition in QLA (Analysis feed into all action plans, referred back to), desire to get higher marks in assessments; compete with team members and other teams, kudos and house points.</p> <p>Confidence: Teach others (reflect on their own progress) and track their peers</p> <p>Respect: Talking to each other, trusting other members of the class and being able to articulate without fear of judgement or reprisal.</p> <p>Empathy: Putting themselves in other people's shoes, peer assessment and peer mentoring. Growing other team member's confidence and supporting them when they are on the brink of giving up.</p> <p>Resilience: Not giving up and seeing every opportunity as a chance to fail and succeed, learning from both.</p> <p>Integrity: Self reflection and doing the right thing (support and sharing but not doing learning for others).</p> <p>Curiosity: To enjoy learning about new concepts, applying these in different contexts and achieving what they thought they previously could not. Exploring things that they did not know about, wonder of creation using scripting.</p>
<p>Needs to boys/MA/PP are met by: Boys - short sharp tasks, autonomy and independence, choice as to what and direction of learning; Sharing and discussion in all suitable tasks; Team leaders to compete against each other.</p> <p>MA - Stretch and challenge in every task (extensions not more work but different application/deeper learning; MA to be given tasks in advanced and if they need more in more closed tasks)</p> <p>PP - questioning directed as those individuals; peer mentoring emphasis and encouragement to aspire to be team leaders.</p>

Year group: Ks4 **YEAR 9, 10, 11** Periods per fortnight: 5

KS4 Curriculum

	Topics studied Add dates and any assessments included	Extended learning opportunities (homework, controlled assessments, field work, trips etc.)	How parents could support students
Autumn Term	<p>Year 9 Von Neumann Architecture; How hardware interacts with software Fundamental programming skills</p> <p>Year 10 Programming Project 20 Hours – OCR TASK</p> <p>Year 11 Programming Project 20 Hours OCR TASK</p>	<p>Year 9 Section 1: Components Computer system; Section 2: Networks;</p> <p>Year 10 Section 5 (Programming)</p> <p>Year 11 Algorithm Design</p> <p>Extended Learning Posted on Google Classroom – summaries on daily summary come through to all parents (once accepted invitation)</p> <p>TRIPS: Monster Confidence (girls only- STEM Trip) Royal Institute's Christmas Lectures</p>	<p>Google Classroom – links; Flash card creation on each topic Testing students</p>
Spring Term	<p>Year 9 Networking – types, typologies, protocols, Ethical and cultural considerations Fundamental programming skills</p> <p>Year 10 Completion Programming Project 20 Hours – OCR TASK End of January Review section 6</p> <p>Year 11 Completion Programming Project 20 Hours OCR TASK End of January Section 1,2,3 Key points Extended questions Algorithm design</p>	<p>Year 9 Section 2: Networks; Section 3 Issues; Section 4: Algorithms;</p> <p>Year 10 Section 6: (Design, Testing, IDEs); Section 7: Data Representation; Examination Questions</p> <p>Year 11 Paper 2 Revision</p> <p>Extended Learning Posted on Google Classroom – summaries on daily summary come through to all parents (once accepted invitation)</p> <p>TRIPS: UK University and Apprenticeship Search Fair</p>	<p>Google Classroom – links; Flash card creation on each topic Testing students</p> <p>Students to share learning with parents (proud of their assessments)</p> <p>All sections will have an end of topic assessment There will be QLA for each assessment which again should be shared with parents by students.</p>

KS4 Curriculum Continued

Summer Term	<p>Year 9 Writing PseudoCode, Flow Charts, Algorithm design Fundamental programming skills</p> <p>Year 10 Section 6 – Testing/Decomposition/abstract thinking, Section 7 Data Representation development</p>	<p>Section 4: Algorithms; Section 5 Programming</p> <p>Pixl Independence Package – Extended Learning</p> <p>EXTENDED Learning Posted on Google Classroom – summaries on daily summary come through to all parents (once accepted invitation)</p>	<p>Students to be starting the lesson with extended learning; creation of flash cards to check learning and preparing for the pre public examination in summer term.</p>
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IMPACT KS4 (Yr9 - 11):

Measuring Impact on year group

- Measure impact through end of topic tests, end of each half term/extended learning section, with EOT tests that interleaving.

How links to virtues, Assessment and intent

- Teacher feedback, and responses from students using comments on extended learning (Extended learning is fed into from class notes, programming book) Showing progress over lesson by lesson, through a lesson (with progress plan to see action points/reflections across the year)
- Holistic students emerging that can articulate and communicate with each other, working independently and in teams (vision for the department). Scaffolding and progress is jointly monitored by leaders and praise/success is celebrated by task, across the lesson and across lessons.

YEAR 7

INTENT:

Students are introduced to the foundations of creative problem solving through both scripting and block based programming.

Aims for year group/key stage:

Develop the ability to find solutions using research skills and apply skills learnt independently to solve problems showing resilience and supporting each other. Teams to have support within the team and from other teams using Team Leader initiative.

Students will understand and be able to:

- Use the internet safely (e-safety awareness and good practice)
- Discuss and select when to use the fundamentals of programming (sequential, repetition, conditional)
- Implement key block and scripting skills (assignment of variables, loops to iterate/increment, if statements to decide whether sections of code run/flow of program)
- Debug for logical and syntax errors and with higher level students looking to solve complex problems

Students will achieve through this curriculum:

- E-Safety and Fundamentals Unit
- Basic Scripting Unit
- Animation Unit
- Microbit Unit

(See description of units below for more details)

School Virtues addressed by:

- Ambition- Students will strive to beat each other in competitions to achieve deeper mastery of the subject, to be the team leader and to be the house the gains the most House Points.
- Confidence- Teach others (reflect on own progress), share good practice and track their teammate's progress.
- Respect- Talking to each other and staff, trusting other members of the class and being able to articulate without fear of judgement or reprisal.
- Empathy- Putting themselves in other people's shoes, peer assessment and peer mentoring. Growing their team's confidence and supporting them in developing resilience.
- Resilience- Debugging and problem solving, learning from the mistakes you make.
- Integrity- Students will take ownership of reporting extending learning and applying key leadership skills.
- Curiosity- Enjoying learning and applying new concepts to achieve success. Research into careers and what computing will do for you if you follow the subject.

YEAR 7 CONTINUED

Needs to boys/MA/PP are met by:

- (MA) Develop into leaders (team leaders) and stretching their leadership abilities using open ended tasks within lessons, challenge questions part of writing strips on extended learning/flightplan.
- (Boys) Focus on gaming hook in extended learning (codeCombat) and competition within lesson.
- (PP) Support sessions for extended learning break times twice a week, teams to support them. Targeted direct questioning.

STEM club enrichment and extension of students.

KS3 - Year 7 Curriculum

Term	Topics studied Add dates and any assessments included	Extended learning opportunities (homework, controlled assessments, field work, trips etc.)	How parents could support students
Autumn Term	<p>Year7</p> <p>Programming Fundamentals and E-Safety (8 weeks)</p> <p>Introduction to JavaScript (13 weeks)</p> <p>Assessment – Formal assessment at the end of each topic.</p> <p>Exam- End of term exam on the topic covered during the year (cumulative) using google forms.</p>	<p>Programming Fundamentals and E-Safety:</p> <p>Students learn the basics of computing using a block based language, allowing them to focus on the logic and problem solving skills rather than the syntax of a text-based language. Throughout the unit, students cover key e-safety terminology and good practice.</p> <p>EXTENDED Learning Posted on Google Classroom – summaries on daily summary come through to all parents (once accepted invitation)</p>	<p>LINKS ARE FOR PARENTS TO USE TO SUPPORT</p> <p>https://www.thinkuknow.co.uk/8_10/stay-safe/</p> <p>https://www.thinkuknow.co.uk/11_13/Need-a-dvice/Digital-footprint/</p> <p>https://www.bbc.com/bitesize/guides/zrtrd2p/revision/1</p> <p>https://www.bbc.com/bitesize/guides/zrxncd/revision/2</p> <p>https://code.org/educate/curriculum/cs-fundamentals-international</p> <p>https://studio.code.org/s/express-2018</p>

Year 7 Continued

Spring Term	<p>Year 7</p> <p>Introduction to JavaScript (13 weeks)</p> <p>Building our own Animation (using conditional statements) (10 weeks)</p> <p>Assessment – Formal assessment at the end of each topic.</p> <p>Exam- End of term exam on the topic covered during the year (cumulative) using google forms.</p>	<p>Introduction to JavaScript and Planning: Students start to learn the basic syntax of a text based language (JavaScript) using Khan Academy as an IDE, as well as how to plan programs. Throughout the unit students will apply the logic of the last unit, while focusing on building up debugging skills and the research based skills to design text based programs to a wide variety of specifications.</p> <p>EXTENDED Learning Posted on Google Classroom – summaries on daily summary come through to all parents (once accepted invitation)</p>	<p>LINKS ARE FOR PARENTS TO USE TO SUPPORT</p> <p>https://www.khanacademy.org/computing/computer-programming/programming/animation-basics/a/what-are-animations</p> <p>https://www.khanacademy.org/computing/computer-programming/programming/interactive-programs/pt/mouse-interaction</p> <p>https://www.khanacademy.org/computing/computer-programming/programming/text-basics/pt/terrific-text-part-one</p>
Summer Term	<p>Year 7 Building our own Animation (using conditional statements) (10 weeks)</p> <p>The Microbit (5 weeks)</p> <p>Assessment – Formal assessment at the end of each topic.</p> <p>Exam- End of term exam on the topic covered during the year (cumulative) using google forms.</p>	<p>Building our own Animation Students learn about conditional statements and basic repetition in JavaScript to design and build a variety of animations throughout the unit.</p> <p>Microbit Students use the BBC Micro Bit to explore how hardware and software interact to build physical devices. Students have a choice if they want to use a Java Script or block based IDE to showcase the logic and their programming skills.</p> <p>EXTENDED Learning Posted on Google Classroom – summaries on daily summary come through to all parents (once accepted invitation)</p>	<p>LINKS ARE FOR PARENTS TO USE TO SUPPORT</p> <p>https://microbit.org/guide/features/</p> <p>https://www.khanacademy.org/computing/computer-programming/programming/logic-if-statements/a/review-logic-and-if-statements</p> <p>https://microbit.org/guide/features/#radio</p> <p>https://makecode.microbit.org/pkg/Microsoft/pxt-microturtle</p> <p>https://makecode.microbit.org/projects/hack-your-headphones</p>

IMPACT:

[How will you measure the impact of your curriculum for this year group?] The impact will be measured by:

- Completion of extended learning End of unit assessments End of term assessments
- Engagement with trips and clubs

[Link back to virtues, assessment and intent]

Intent:

The students will be able to demonstrate creative problem solving as they learn programming, complete research in extended learning and work with their teams to complete projects.

Assessment:

Extended learning to incorporate all learning coming together. Students will undertake a practice/mock assignment to prepare them for End of Term (EOT) and reflection/action points to be drawn out and recorded on flight plan. EOT assessment covers all the material that has been taught in each term, interleaving.

Virtues:

- Ambition- Students enter the lesson wanting to learn and engage with content, beginning in the competitive starter activity with culture of desire for house points and pride in their extended learning (Quality of written and oral responses). Ambition is nurtured through celebration of success and students working positively towards decomposition and abstract tasks (building up skills so that they can make a large project).
- Confidence- Celebration of work produced, sharing within their team and publicly across the class and whole school (bulletin/digital signage/STEM)
- Respect- Each person has a view that can be shared with someone interrupting or making unnecessary comment about said opinion/idea. The classroom environment is sacred to ensure students trust each other (with the teacher proactively enforcing rule of listening and allowing others to teach/discuss)
- Empathy- Students reflect on how they feel when someone shows interest and praise for their contributions. Teacher to reinforce/facilitate this culture so that all students can interact and care about what is said/learnt by others within their team and beyond.
- Resilience- Never give up attitude is visible in their approach to learning, particularly in tasks requiring them to practice debugging.
- Integrity- Ownership and support in mentoring their team members and in reporting of extended learning.
- Curiosity - continue whole school theme of enjoying learning for the sake of learning. Looking for learning opportunities, and asking why.

YEAR 8

INTENT:

Students refine and approach the higher learning skills of programming using a scripting language and hardware.

Aims for year group/key stage:

Be able to independently research and creatively solve problems, within a team led by a student.

Students will understand and be able to:

- Select and use functions, with MA looking to create their own functions much earlier in the term (Challenge tasks are integral to all lessons with differentiation/choice in every task)
- Find and evaluate documentation for simple and complex operations in scripting, applying research in correct context to solve problems set
- Remember to approach all problems with growth mindset, understand that the nature of problem solving is to failure but they will learn more from getting it wrong than they will from getting it right straight away.
- Apply advanced concepts such as if statements, loops and build up sections of code which can then be applied to create large scale independent projects

Students will achieve through this curriculum:

- Functions Unit
- Conditionals and Repetition Unit
- Game Making Unit
- Robotics Unit

(See description of units for more details)

School Virtues addressed by:

- Ambition- Students will strive to beat each other in competitions to achieve deeper mastery of the subject, to be the team leader and to be the house the gains the most House Points.
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YEAR 8 CONTINUED....

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STEM club enrichment and extension of students.

KS3 - Year 8 Curriculum

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Autumn Term	<p>Functions (10 weeks)</p> <p>Conditional Statements and Repetition (11 weeks)</p> <p>Assessment – Formal assessment at the end of each topic.</p> <p>Exam- End of term exam on the topic covered during the year (cumulative) using google forms.</p>	<p>Functions: Students learn how to design and build their own custom functions - this unit is the building block of the game making unit that year 8 students produce. Students are walked through how to build a function and are given plenty of time to practice the high level programming in javaScript.</p> <p>EXTENDED Learning Posted on Google Classroom – summaries on daily summary come through to all parents (once accepted invitation)</p>	<p>LINKS ARE FOR PARENTS TO USE TO SUPPORT</p> <p>https://www.khanacademy.org/computing/computer-programming/programming</p> <p>https://www.khanacademy.org/computing/computer-programming/programming/functions/pt/functions</p>
Spring Term	<p>Conditional Statements and Repetition (11 weeks)</p> <p>Building our own graphical game (12 weeks)</p>	<p>Conditional Statements and Repetition: In this unit students practice and learn the necessary skills to build “smart” interactive programs, with a focus on building complex if statements using Boolean Algebra that allow multi-stage programs. Throughout the unit,</p>	<p>LINKS ARE FOR PARENTS TO USE TO SUPPORT</p> <p>https://www.khanacademy.org/computing/computer-programming/programming#logic-if-statements</p>

	<p>Assessment – Formal assessment at the end of each topic.</p> <p>Exam- End of term exam on the topic covered during the year (cumulative) using google forms.</p>	<p>students will also learn how to use a count controlled loop to simplify their program.</p> <p>EXTENDED Learning Posted on Google Classroom – summaries on daily summary come through to all parents (once accepted invitation)</p>	
Summer Term	<p>Building our own graphical game (12 weeks)</p> <p>Robotics (4 weeks)</p> <p>Assessment – Formal assessment at the end of each topic.</p> <p>Exam- End of term exam on the topic covered during the year (cumulative) using google forms.</p>	<p>Game Making:</p> <p>In this unit students design and implement their first game, it builds upon the techniques learned in year 7 and 8, in particular the use of functions and logic. The game includes moving between levels, a start and end screens as well as a host of additional options for customization.</p> <p>EXTENDED Learning Posted on Google Classroom – summaries on daily summary come through to all parents (once accepted invitation)</p>	<p>LINKS ARE FOR PARENTS TO USE TO SUPPORT</p> <p>https://www.khanacademy.org/computing/computer-programming/programming-games-visualizations/programming-scenes/a/what-are-scenes</p> <p>https://4tronix.co.uk/blog/?p=1490</p> <p>https://www.l33t.uk/bitbot/</p>

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