PUTTING THE FUN BACK INTO LEARNING!

Computing Curriculum Guide

January 2018

Dear Parents and Guardians,

Welcome to the ICT and Computing January Curriculum Guide. Our aim is to make all students computer literate and to do this we provide a curriculum which is challenging, progressive and relevant. Our high-quality computing education equips our students with computational thinking and creativity to understand and change the world.

The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. By continually building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that our students become digitally literate at a level suitable for the future workplace and as active participants in a digital world.

KS2 and KS3 –

Grade 5, 6, 7 and 8 are attending a double lesson every week. In each lesson, students are learning theory topics along with practical skills.

KS4 –

All Grade 9 students are doing ICT as a double lesson each week. Students in Grade 10 who have not chosen Physics continue to study ICT for a double lesson a week. Those KS4 students who have selected Computer Science at grade 9 and 10 as an optional subject are attending an additional 5 lessons a week to cover the Computing course.

The Core Topics:

This term

Grade 5:

Students will cover the topic of programming using Scratch to learn basic computational thinking skills. Students will create their own games using visual programming to create different types of programs such as games.

Grade 6

Students will cover the topic computer network and will look at how computer networks and search engines work. Students will be looking at online risks and security issues that can develop in computers.

Grade 7

Students will learn about Digital Multimedia, this term students will be creating their digital portfolio on their movie. Students will learn how to edit images using Adobe Photoshop. Students will use different editing techniques and a variety of different editing tools.

Grade 8

Students will learn about Digital Multimedia, this term students will be creating their digital portfolio on their movie. Students will learn how to edit images using Adobe Photoshop. Students will use different editing techniques and a variety of different editing tools.

Grade 9

In ICT lessons Grade 9 students will be learning about personal digital devices, their uses, functions and features. Students will learn how to select appropriate digital devices to meet the needs of different users and justify their selections.

In Computer Science lessons Grade 9 students who have chosen this option will be covering theory topics on computer architecture, the fetch/execute cycle, data transmission and security aspects. They will also be doing practical work on programming concepts, designing and writing programs in Python.

Grade 10

In ICT lessons Grade 10 students will be learning about data storage and capacity, how systems can be connected to form a network, the benefits of a network and how data can be secured on a network. They will also be doing practical tasks to enable them to become proficient in using office based software.

In computer science lessons Grade 10 students who have chosen this option will be covering theory topics on ethics, security, data transmission, security aspects and Internet theory and operation. They will also be doing practical work on programming concepts, designing and writing programs in Python.

How Can You Help? Encourage your child to enjoy working on their skills developed by practicing at home using the websites recommended below.

Homework: All assigned homework will be either paper based or electronic. Students will require USB to backup work and take electronic copies of homework when required.

Useful Website:

Grade 5: https://scratch.mit.edu/

Grade 6: https://codecombat.com/

Grade 7: www.bbc.co.uk/education/subjects/zvc9q6f

Grade 8: www.bbc.co.uk/education/subjects/z8mtsbk

Grade 9 (ICT): http://www.bbc.co.uk/education/subjects/zqmtsbk

Grade 9 (Computing): http://www.bbc.co.uk/education/subjects/z34k7ty

Grade 10 (ICT): http://www.bbc.co.uk/education/subjects/zqmtsbk

Grade 10 (Computing): http://www.bbc.co.uk/education/subjects/z34k7ty

Curriculum Content for Oct 2017:

Grade 5: Scratch - programming

Session Name	Description	Learning Intention
Programming Skills	Introducing Scratch	• To explain the interface of Scratch • To explain difference between bitmap image and vector image. • To explain using Sprites, applying backgrounds, adding and deleting sprites. • To learn and practice switching between costumes and customizing costumes. • To learn about events and different control structures. • To apply techniques learned in different assigned projects.
	Project 1: Monster's feeling	
	Project 2: Introduction to Story boards	
	Project 3: Side Scroller	
	Project 4: Parallax	

Grade 6: Computer Networks and security

Session Name	Description	Learning Intention
Computer network and security risk	How search engine work	• recognise how search engines find web pages and how to perform effective Searches. • Be able to understand the ethical issues surrounding using data online and restricting Internet access. • Understand what is meant by the terms Spam, Phishing and Viruses. • Understand the main methods to protect against online security threats and be able to recognise the characteristics of a secure password.
	Computer Networks	
	Online risk and security	

Grade 7: Digital Multimedia

Session Name	Description	Learning Intention
Digital images	Students will learn about the different images types and the effect pixelated images	• Understand how a digital image is made up. • Be able to recognise the affect changing the resolution has on an image. • Understand how a computer displays coloured images using binary and RGB values. • Understand how to combine the dodge and burn tools along with spot removal in Photoshop.
Resolution and PPI	Students will learn the difference Resolution has on the display of images	
RGB Values	Students will learn how the RGB values are added to create all the different colour	
Creating a flawless image	Students will learn how to use different tools to create a flawless image on Photoshop	

Grade 8: Digital Multimedia

Session Name	Description	Learning Intention
Digital images	Students will learn about the different images types and the effect pixelated images	• Understand how a digital image is made up. • Be able to recognise the affect changing the resolution has on an image. • Understand how a computer displays coloured images using binary and RGB values. • Understand how to combine the dodge and burn tools along with spot removal in Photoshop.
Resolution and PPI	Students will learn the difference Resolution has on the display of images	
RGB Values	Students will learn how the RGB values are added to create all the different colour	
Creating a flawless image	Students will learn how to use different tools to create a flawless image on Photoshop	

Grade 9 ICT:

Session Name	Description	Learning Intention
Types of digital devices	Students need to know about computers and other digital devices. They need to understand how each type of device is used but not the	• Be aware that mainframe computers are used for complex processing tasks and microprocessors are embedded in products such as washing machines. • Understand that laptop and desktop computers are types of personal

	technology behind their operation.	computers. Some laptops are used as desktop replacements. • Know about types of mobile phones; smartphones and specialist phones and how they connect to the network (SIM). • Know about tablet devices. • Be able to describe the purpose and use of other digital devices such as: • cameras and camcorders • games consoles • home entertainment systems • media players. • Know about navigation aids and how they are used. • Understand the terms 'multifunctional' (e.g. mobile phones that include a camera, have limited game playing functionality and GPS) and 'convergence' (e.g. functionality of smartphones and tablet devices becomes more similar) in the context of digital devices.

Grade 10 ICT:

Session Name	Learning Intention	Description
Understand data storage capacity terminology	Storage capacity terms: bit, byte and multiples of these (kbytes, mbytes, gbytes, tbytes)	• Know about user needs: for example business, entertainment, education, communication. • Understand hardware requirements: type/speed of processor, amount of memory, capacity of hard drive, external storage devices, type of monitor, type of printer, additional requirements, for example graphics card, sound card
Understand that ICT devices can be linked together to form networks	Understand that ICT devices can be linked together to form networks Understand the benefits of establishing a network Understand how data can be secured on a network	• Understand about the types of networks: wired, wireless; LAN, Network components: cable, router, booster, wireless enabled devices (for example wi-fi, Bluetooth), media streaming devices IP address • Understand the benefits of networks: shared peripherals, shared data, flexible access, media streaming, communication, control of user access rights, centralised administration, simultaneous access to the internet • Know about network security: log-ins and passwords, firewall, WEP/WPA, encryption, file access rights, transaction logs, backups

Grade 9 Computing:

Topic	Description	Learning Intention
Computer architecture and the fetch execute cycle	Computer architecture	• show understanding of the basic Von Neumann model for a computer system and the stored program concept (program instructions and data are stored in main memory and instructions are fetched and executed one after another)
	Fetch Execute Cycle	• describe the stages of the fetch-execute cycle, including the use of registers and buses
Communication and Internet technologies	Data Transmission	• show understanding of what is meant by transmission of data • distinguish between serial and parallel data transmission • distinguish between simplex, duplex and half-duplex data transmission • show understanding of the reasons for choosing serial or parallel data transmission •show understanding of the need to check for errors • explain how parity bits are used for error detection • show understanding of the use of serial and parallel data transmission, in Universal Serial Bus (USB) and Integrated Circuit (IC)
	Security aspects	• show understanding of the security aspects of using the Internet and understand what methods are available to help minimise the risks • show understanding of the Internet risks associated with malware, including viruses, spyware and hacking • explain how anti-virus and other protection software helps to protect the user from security risks

Data structures	Programming Concepts	• declare and use variables and constants • understand and use basic data types: Integer, Real, Char, String and Boolean • understand and use the concepts of sequence, selection, repetition, totaling and counting • use predefined procedures/functions
	Data Structures	• declare and use one-dimensional arrays, for example: A[1:n] • show understanding of the use of one-dimensional arrays, including the use of a variable as an index in an array • read or write values in an array using a FOR … TO … NEXT loop

Grade 10 Computing:

Session Name	Description	Learning Intention
Ethics	Ethics	• show understanding of computer ethics, including copyright issues and plagiarism • distinguish between free software, freeware and shareware • show understanding of the ethical issues raised by the spread of electronic communication and computer systems, including hacking, cracking and production of malware
Security	Keeping data safe	• show understanding of the need to keep data safe from accidental damage, including corruption and human errors • show understanding of the need to keep data safe from malicious actions, including unauthorised viewing, deleting, copying and corruption
	Data security methods	• show understanding of how data are kept safe when stored and transmitted, including: – use of passwords, both entered at a keyboard and biometric – use of firewalls, both software and hardware, including proxy servers – use of security protocols such as Secure Socket Layer (SSL) and Transport Layer Security (TLS) – use of symmetric encryption (plain text, cypher text and use of a key) showing understanding that increasing the length of a key increases the strength of the encryption

	Online data security Online banking and shopping	• show understanding of the need to keep online systems safe from attacks including denial of service attacks, phishing, pharming • describe how the knowledge from 1.4.1, 1.4.2 and 1.4.3 can be applied to real-life scenarios including, for example, online banking, shopping
Communication and Internet technologies	Data Transmission Security aspects and Internet Principles	• show understanding of what is meant by transmission of data • distinguish between serial and parallel data transmission • distinguish between simplex, duplex and half-duplex data transmission • show understanding of the reasons for choosing serial or parallel data transmission •show understanding of the need to check for errors • explain how parity bits are used for error detection • show understanding of the use of serial and parallel data transmission, in Universal Serial Bus (USB) and Integrated Circuit (IC) • show understanding of the security aspects of using the Internet and understand what methods are available to help minimise the risks • show understanding of the Internet risks associated with malware, including viruses, spyware and hacking • explain how anti-virus and other protection software helps to protect the user from security risks • show understanding of the role of the browser • show understanding of the role of an Internet Service Provider (ISP) • show understanding of what is meant by hypertext transfer protocol (http and https) and HTML • distinguish between HTML structure and presentation • show understanding of the concepts of MAC address, Internet Protocol (IP) address, Uniform Resource Locator (URL) and cookies

Programming	Programming concepts	• declare and use variables and constants • understand and use basic data types: Integer, Real, Char, String and Boolean • understand and use the concepts of sequence, selection, repetition, totaling and counting • use predefined procedures/functions
	Data structures	• declare and use one-dimensional arrays, for example: A[1:n] • show understanding of the use of one-dimensional arrays, including the use of a variable as an index in an array • read or write values in an array using a FOR … TO … NEXT loop

Best Regards,

Ms. Imaan Good imaan.g@albasmaschool.ae

Mr. Roger Wilson roger.w@albasmaschool.ae

ICT & Computing Specialist Teachers