ایک قوم
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ONE NATION ONE CURRICULUM

Single National Curriculum 2022

COMPUTER SCIENCE

Computer Science (6-8)
Progression Grid

The Progression Grid template below is taken from the English Curriculum 2020[1]. There are two changes made. First, the template begins with the Domain name instead of Competency. Second, the columns are extended to Grade 12. Please note that some Standards and Student Learning Outcomes will not begin until a higher grade or learning level. This template format must be consistent for all subjects.

The Domains in this are:

A. ICT Fundamentals
B. Digital Skills
C. Algorithmic Thinking and Problem Solving
D. Programming
E. Digital Citizenship
F. Entrepreneurship in Digital Age

Progression Grid

Domain A: ICT Fundamentals

Standard: Students develop an understanding of ICT, ICT devices, computer systems (hardware), and networks

Grade 6	Grade 7	Grade 8
Benchmarks: Students will be able to recognize computer systems and various ICT devices; differentiate between hardware and software; analyze the importance, advantages, and uses of ICT devices; analyze the use of emerging technologies in various walks of life; define a network, identify and analyze the core networking components and their roles		
Student learning outcomes		
[SLO: CS-06-A-01] Students will be able to recognize various ICT devices and their applications.		
	[SLO: CS-07-A-01]Students will be able to identify the use of emerging technologies in various walks of life (e.g. artificial intelligence, biometrics, robotics, computer-	[SLO: CS-08-A-01] Students will be able to analyze the usage of emerging technologies in various walks of life (e.g. artificial intelligence, 5G, robotics, computer-assisted

[1] http://www.mofept.gov.pk/SiteImage/Misc/files/SNC%20English%201-5.pdf (pg. 22)

	assisted translation, 3D and holographic imaging, virtual reality, Cloud Computing, and open-source software.	translation, 3D and holographic imaging, virtual reality, distributed applications, block-chain, and Machine Learning.)
[SLO: CS-06-A-02] Students will be able to define and differentiate between computer hardware and software.		
[SLO: CS-06-A-03] Students will be able to identify and analyze (basic) hardware components of a computing system (e.g.processor, memory and storage).	[SLO: CS-07-A-02] Students will be able to identify (advanced) hardware components of a computing system (e.g. different types of I/O ports, different types of peripherals, and networking components).	
		[SLO: CS-08-A-02] Students will be able to identify and analyze a network and identify core networking components and their roles.

Domain B: Digital Skills

Standard: Develop various digital skills pertaining to usage of operating systems, image processing, word processing, presentation, and data handling.

Grade 6	Grade 7	Grade 8
Benchmarks: Students will be able to navigate around an Operating System; efficiently use computer hardware; develop and demonstrate image processing, word processing, presentation, and data handling skills (using various software tools)		
Student learning outcomes		
[SLO: CS-06-B-01] Students will be able to navigate around an Operating System (e.g. Microsoft Windows, MAC OS, Linux, Ubuntu, Android, iOS, etc).		
[SLO: CS-06-B-02] Students will be able to develop and demonstrate image-processing skills (using various software tools e.g. Paint, 3D Paint, Tux, etc.), while efficiently using computer hardware (e.g. mouse, keyboard, etc.)	[SLO: CS-07-B-01] Students will be able to develop and demonstrate word-processing and presentation skills (using various software tools e.g. MS Word, MS	[SLO: CS-08-B-01] Students will be able to develop and demonstrate data handling skills (using various software tools e.g. MS Excel, Google sheets, etc.)

	PowerPoint, Prezi, Canva, Photo Story, Movie-maker, etc.)	
[SLO: CS-06-B-03] Students will demonstrate how to navigate the internet to conduct a search query and arrive at an authentic result.	[SLO: CS-07-B-02] Students will get introduced to electronic mailing systems (e-mail) and learn appropriate usage.	*[SLO: CS-08-B-Add]* **Additional SLO** *Students will learn how to research information from the internet for a report that answers a research question and communicates results and conclusions.*

Domain C: Algorithmic Thinking and Problem Solving

Standard: Identify, define, and analyze a problem, and apply algorithmic thinking and problem-solving strategies to develop step-by-step solutions to solve problems

Grade 6	Grade 7	Grade 8
Benchmarks: Students will be able to identify, define and analyze a problem; apply the concepts of computational thinking and problem-solving strategies to solve complex problems; apply basic concepts and concept of nesting in algorithmic design thinking		
Student learning outcomes		
[SLO: CS-06-C-01] Students will be able to identify, define and analyze a problem	[SLO: CS-07-C-01] Students will be able to apply the concept of computational thinking to handle complex problems.	[SLO: CS-08-C-01] Students will be able to apply the concepts of computational thinking and problem-solving strategies to solve complex problems by identifying the most efficient algorithm
[SLO: CS-06-C-02] Students will be able to apply basic algorithmic thinking to solve different types of problems.	[SLO: CS-07-C-02] Students will be able to apply concepts of conditional statements, finite and infinite loops to write different algorithms.	[SLO: CS-08-C-02] Students will be able to apply the concepts of nesting in algorithmic design thinking.

Domain D: Programming

Standard: Understand and apply fundamental programming constructs using visual and textual programming tools

Grade 6	Grade 7	Grade 8
Benchmarks Students will be able to recognize the fundamentals of computer programming; analyze how computers encode and decode information; apply fundamental programming constructs by creating various types of programs using visual programming tools.		
Student learning outcomes		
[SLO: CS-06-D-01] Students will be able to analyze the fundamentals of computer programming.	[SLO: CS-07-D-01] Students will be able to explain how computers encode and decode computer programs (i.e. identification of decimal to binary and vice versa, conversion of texts, images and sounds in binary).	
[SLO: CS-06-D-02]Students will be able to analyze and apply basic programming constructs (e.g. sequence, selection, repetition, variables, inputs/events); by creating simple single-sprite, single-script programs using a visual programming tool. *[SLO: CS-06-D-Add]* **Additional SLO**: *Students will be able to apply basic programming constructs (e.g. sequence, selection, repetition, variables, inputs/events); by creating simple single-sprite, single-script programs using textual programming tools.*	[SLO: CS-07-D-02] Students will be able to apply fundamental programming constructs to create multi-sprite, multi-script programs using visual programming tools. *[SLO: CS-07-D-Add]* **Additional SLO**: *Students will be able to apply fundamental programming constructs to create multi-sprite, multi-script programs using textual programming tools.*	[SLO: CS-08-D-01] Students will be able to apply intermediate-level programming constructs (e.g. functions, cloning, conditional movement); by creating mini-games using a visual programming tool. *[SLO: CS-08-D-Add]* **Additional SLO**: *Students will be able to apply intermediate-level programming constructs (e.g. functions, cloning, conditional movement); by creating mini-games using a textual programming tool.*
		[SLO: CS-08-D-Add] ***Additional SLO*** *Students will be able to analyze constructs and fundamentals of textual (syntax-based) programming.*

Domain E: Digital Citizenship

Standard: Learn the basics of the internet, write an email, identify risks involved in an online exchange of information and apply digital safety protocols.

Grade 6	Grade 7	Grade 8
Benchmarks: Students will be able to use the internet through various connections, search relevant and authentic content, write an email for different purposes and protect the device against viruses. Students will also be able to identify and apply ICT and internet ethics, mitigate health risks involved in using ICT devices, familiarize themselves with cyber issues, and realize risks involved in information exchange by taking necessary precautions against cyber issues.		
Student learning outcomes		
[SLO: CS-06-E-01] Students will analyze the basics of information literacy and digital civility and appropriate uses of technology.	[SLO: CS-07-E-01] Students will identify ways to protect against malicious activities or behaviors in the digital environment.	[SLO: CS-08-E-01] Students will identify ways of protecting against cybercrimes.

Domain F: Entrepreneurship in Digital Age

Standard: Students apply problem-solving skills to solve a market need.

Grade 6	Grade 7	Grade 8
Benchmarks: Students will apply the tools and mindsets needed to develop and launch a business idea.		
Student learning outcomes		
[SLO: CS-06-F-01] Students will define and analyze entrepreneurship subtypes and summarize the entrepreneurship process	[SLO: CS-07-F-01]Students will analyze the uses and benefits of design thinking for entrepreneurs.	[SLO: CS-08-F-01] Students will develop an understanding of the basics of digital marketing platforms and social media marketing to develop a marketing plan for a business.
		[SLO: CS-08-F-02] Students will be able to identify and create different components of a business plan i.e. market need, product design, costing, operations, and marketing.