binarylogic

Reengineering Education

COMPUTER SCIENCE
COMPUTING · ICT

CURRICULUM AND RESOURCES

DIGITAL KIDS - DIGITAL TEENS - ESKILLS - ICT SKILLS
DIGITAL WORLD – NEXTGEN SPECIALISTS

BINARYACADEMY

mm
educational group

January 2025

WHAT IS BINARY LOGIC?

Binary Logic is a dynamic technology publishing company specializing in the development of high-quality, innovative educational material since 1982. The company belongs to the MM Educational Group, dedicated to excellence in education and offering a wide range of printed and digital material and educational services since 1974. Today, our group operates in over 110 countries worldwide and boasts over 4000 titles.

All of Binary Logic's products are based on pedagogically sound methodologies. They incorporate contemporary and engaging topics and are characterized by appealing visual material and cutting-edge technology. Binary Logic's educational material has been designed based on feedback from Computing and English language experts and teachers worldwide and enhanced by including the latest model syllabi and exam specifications. It provides opportunities for extended learning by:

- Exposing students to a broader range of experiences.
- Developing 21st-century skills through educational resources aligned with and supporting digital-age learning.
- Enhancing cross-disciplinary knowledge, connections and understanding.
- Bringing about more active and meaningful learning experiences.

Binary Logic, an organization wholly dedicated to producing quality material of consistent value, has the expertise and the experience to offer you innovative and effective solutions for Computing and ICT that challenge traditional curricula and books.

OUR EXPERIENCE IN COMPUTING - ICT

Binary Logic has worked actively with schools, universities and Ministries of Education worldwide since 1982. Having closely researched and analyzed the way ICT has been taught in schools, we concluded that the available curriculum, textbooks, and teaching methods were too old-fashioned for a subject that is so new and is changing so fast. Based on our experience with educational institutions, teachers, and students, we developed our Computing and ICT curriculum for K-12 and higher education. This new curriculum is changing the way the subject is taught and learned. Although this endeavor is relatively new, we successfully entered many countries from the first year our Computing and ICT solutions became available:

Qatar: Following a brief introduction to international schools in Doha and adopting our series in graded English for non-native speakers, we worked closely with the Qatari MoE to develop the new Computing and Information Technology standards for K-12 based on the Qatar National Curriculum Framework. The Computer Science departments and curriculum development experts of three Qatari Higher Education institutions (Qatar University, Carnegie Mellon University in Qatar and College of the North Atlantic – Qatar) reviewed the curriculum standards. Based on our curriculum standards, we developed entirely new Computing and ICT material in Arabic for all grades in Qatari state schools (32 textbooks) from Early Years to a special CS-IT Technical Track for high school students. The project is the main case study for a modern Computer Science curriculum in UNESCO's March 2022 Report on K-12 AI Curricula.

Saudi Arabia: Our international Computing and ICT series in English have been approved by the Ministry of Education for use in private schools in Saudi Arabia since 2014. In 2021-2023, we adapted and provided Saudi state schools with "Digital Skills" and "Digital Technology" resources for grades 4-12 in Arabic. We also developed new

resources with advanced content for the Computer Science and Engineering Pathway (Grades 11-12) and for topics in demand taught in high schools for the first time as separate subjects: Data Science, Cybersecurity, Engineering, Internet of Things, Artificial Intelligence, Engineering Design and Software Engineering.

Oman: After introducing our Digital Kids and Digital Teens series to the private schools in Oman and getting very positive feedback from their ICT teachers, we submitted our teaching material to the Ministry of Education. The Ministry's experts responsible for ICT in K-12 have reviewed and approved our materials for use in the Omani private bilingual schools. We have developed new resources for upper high school grades in cooperation with the Ministry of Education. Binary Logic has developed custom ICT resources for Omani state schools for Grades 1-4 in Arabic and continues for Grades 5-8 and Grades 11-12.

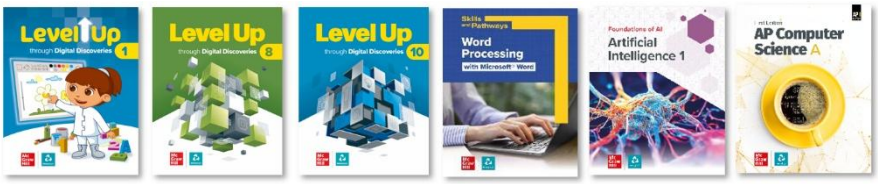
Ukraine: Working with our local partner, our resources were adapted into Ukrainian for private schools. The Ministry of Education and Science approved these materials for all public schools. We are deeply honored to have the support of UNICEF as part of their 'Back to Learning Together' initiative, which has generously funded the printing of our student textbooks for the secondary grades.

Peru: Our first Computing and ICT material was published in February 2013, and we immediately began working with schools in Peru in March 2013 (the beginning of the academic year) with our regional Spanish edition for Latin America. BinaryAcademy Peru is responsible for implementing Binary Logic's solutions in the region.

Puerto Rico: We work with the Department of Education to provide our eSkills (for grades 1–12) and Digital Teens (for grades 7–12) series to all Puerto Rican state schools. Both series are available in English and Spanish, facilitating bilingual students. The resources were presented in a series of Spanish-language webinars attended by ICT teachers. All ICT teachers attended two cycles of webinars in Spanish to understand how to use the resources effectively.

We incorporated feedback into our curriculum from countries like the USA, Brazil, Canada, **Puerto Rico (DoE approved, used in state schools)**, Mexico, Colombia, Peru, Chile, Costa Rica, Guatemala, El Salvador, Ecuador, Dominican Republic, Panama, Paraguay, Ireland, Georgia, **Ukraine (MoE edition for state schools),** Poland, Romania, **Serbia (MoE edition for state schools)**, **Albania (MoE edition, under review)**, **Montenegro (MoE edition for state schools)**, Greece, Hungary, Cyprus, Malta, United Kingdom, Turkey, Lebanon, Syria, Jordan, Yemen, Sudan, Egypt, Cameroon, Tanzania, Botswana, Iraq, **Saudi Arabia (MoE edition for state schools)**, Bahrain, **Oman (MoE approved for private schools, Qatar (MoE edition for state schools)**, **United Arab Emirates (MoE approved)**, **Kazakhstan (MoE approved, used in state schools)**, Pakistan, India, Sri Lanka, China, Korea, Thailand, Singapore, Malaysia, Cambodia, Vietnam, Indonesia, Japan, the Philippines, Australia and New Caledonia. Our latest projects are in Georgia (MoE edition for state schools, under review) and Cameroon (under review by MoE). Until now, our resources are available in 14 languages: English, Spanish, Modern Standard Arabic, Gulf Arabic, French, Ukrainian, Serbian, Montenegrin, Albanian, Romanian, Georgian, Vietnamese, Russian and Kazakh.

In partnership with **McGraw Hill**, Binary Logic has expanded its global reach by co-developing innovative educational resources for K-12 students. This collaboration combines Binary Logic's expertise in Computing with McGraw Hill's long-standing reputation for academic excellence. These series, such as **Level Up through Digital Discoveries**, **Skills & Pathways**, **AP CSA/CSP** and **Foundations**, provide engaging and forward-looking textbooks and digital resources aligned with the latest CS and ICT standards.



RESOURCES FOR ALL TYPES OF EDUCATIONAL INSTITUTIONS

Private schools are usually free to choose the best educational material available. International and bilingual schools usually use our graded English edition for non-native speakers. Public schools can choose different curricula from those their Ministry has approved. There are custom resources in the students' native languages in several countries for use in state schools. Language and summer schools can use the English edition as an engaging tool for ELL students in a CLIL-CBI setting to support their language development and content comprehension. Colleges and universities use Binary ICT Skills in foundation courses to prepare students academically and professionally. Training centers use Binary ICT Skills for employees and prepare candidates for international ICT examinations.

NextGen Specialists is a comprehensive series designed to empower students with cutting-edge skills essential for the digital age. Covering a wide range of subjects, from Data Science and Engineering to Artificial Intelligence and Cybersecurity, this series equips learners with the knowledge and expertise needed for academic excellence and a successful future in the workforce: Data Science - Artificial Intelligence - Internet of Things - Software Engineering - Cybersecurity – Electronics - Engineering Design

A COMPLETE COMPUTING AND ICT SYLLABUS SUITABLE FOR ANY SCHOOL

Our Digital Kids, Digital Teens and eSkills series are used effectively in public and private schools in diverse countries such as the USA, Peru, Ireland, Ukraine, Serbia, Kazakhstan, Turkey, Saudi Arabia, Pakistan, Sudan, China, Thailand, and Japan. The various users of our material include IB schools, international and bilingual schools using the graded English editions, state and public schools, and language schools that offer extra practice in English in the specialist field of technology.

The Binary ICT Skills Second Edition series can be used in ICT exams centers, training centers, colleges, and universities requiring foundation ICT courses:

Modern Computing
Word Processing With Microsoft® Word
Spreadsheets With Microsoft® Excel
Presentations With Microsoft® PowerPoint
Databases With Microsoft® Access
eCommerce
Graphic Design

ADHERENCE TO LOCAL MOE STANDARDS

Ministries of Education require or recommend a Computing and ICT curriculum framework for secondary or even primary schools in many countries. Designing our global syllabus, we have considered the guidelines from various MoEs that have done much work in this area. Our material is already used in many different countries without changes. If our series do not fulfill the requirements of your MoE, we are keen to discuss the possibility of adapting our series according to the specific needs of your country.

COMPUTING AND ICT IN OTHER LANGUAGES – CUSTOM EDITIONS

We can currently provide our Computing and ICT series and all the teaching resources in English (graded English for non-native speakers) and Spanish (for Latin America). We are developing the material in French and Arabic and are happy to discuss a solution in your native language.

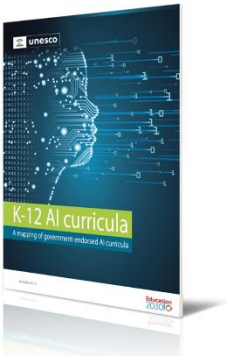
SYLLABUS AND CURRICULUM DEVELOPMENT

We have extensively researched the curriculum frameworks that international organizations have developed, the guidelines and requirements of Ministries of Education worldwide and the real needs of contemporary students of each age group. Based on our findings, our learning materials have been prioritized and split into one primary and one secondary series based on a spiral methodology. Age and school grade were considered to make the material suitable for children and teenagers. Due to the constantly advancing nature of technology, we continuously revisit our Computing and ICT syllabus and make minor adjustments or significant changes as needed.

Our thorough and forward-thinking approach and experience in syllabus development have been recognized by UNESCO, which mentions Binary Logic as the only educational publisher with modern AI curricula for state schools and features the curriculum framework and resources that we developed in collaboration with Qatar's Ministry of Education as a case study for a comprehensive nationwide solution. Additional Ministries of Education have been cooperating with Binary Logic to fulfill their Computing-ICT curriculum requirements since March of 2022 (Oman, Puerto Rico). This indicates a positive level of confidence in our capabilities and efficacy in meeting any educational needs.

Download the UNESCO report with all the details from here:
https://unesdoc.unesco.org/ark:/48223/pf0000380602

unesco
March 2022



Saudi Arabia	4. Digital Skills	Binary Logic and Tatweer Co.

Qatar	Computing and Information Technology	Binary Logic, Ministry of Education and Higher Education
	Computing and Information Technology (High Tech Track)	Binary Logic, Ministry of Education and Higher Education

A country-wide solution for K-12 education **Kingdom of Saudi Arabia**

A country-wide solution for K-12 education **State of Qatar**

FULL SUPPORT FOR CODING AND ROBOTICS

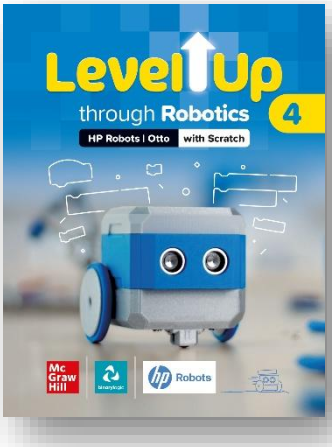
We provide the most extensive Coding and Robotics syllabus with resources for many teaching hours in the core school curriculum or as extra STEM activities. We have developed a series of supplementary materials specifically for computational thinking in the different age groups. We continuously add more content based on teacher feedback and the latest trends and developments in Computer Science education.

Starting in Grade 1 for both topics, we gradually introduce young students to computational thinking concepts with "unplugged" and technology-based activities. We continue until Grade 12, which introduces advanced Computer Science concepts to prepare students for college or university studies. We use various tools based on the age group and the school budget for robotics hardware. All material is in the form of online ebooks, and teachers receive additional teaching resources to help them explain topics easily and understandably. These supplements, together with the material in the student's book, cover all 12 grades:

	Grade	1	2	3	4	5	6	7	8	9	10	11	12
Coding / Programming	**Bumblebee Alda / Unplugged**												
	Digital Kids Go! / Unplugged												
	LOGO												
	ScratchJr												
	MIT Scratch												
	Microsoft Small BASIC												
	Microsoft Kodu												
	Python 3 (IDLE/Visual Studio Code)												
	DS: Python & Jupyter Notebook												
	IoT: MakeCode & Micro:bit												
	IoT: Python & Micro:bit circuits												
	IoT: Python & Arduino circuits												
	AI: Python & Jupyter Notebook												
	Mobile Dev: MIT App Inventor												
	SWE: MIT App Inventor												
	HTML5 - CSS3 - PHP - JavaScript												
	Visual Basic												
Robotics	**BeeBot / Unplugged**												
	LEGO® WeDo 2.0 (Icon Blocks)												
	LEGO® WeDo 2.0 (Scratch)												
	LEGO® Spike Essential (Icon Blocks)												
	LEGO® Spike Essential (Scratch)												
	LEGO® Spike Prime (Scratch)												
	LEGO® Spike Prime (Python)												
	LEGO® EV3 (Mindstorms Blocks)												
	LEGO® EV3 (Scratch/Makecode)												
	LEGO® EV3 (Python)												
	HP Otto Robot (Icon Blocks)												
	HP Otto Robot (Scratch)												
	HP Otto Robot (Python)												
	Arduino Alvik (Scratch)												
	Arduino Alvik (Python)												
	Edison Robot (EdBlocks)												
	Edison Robot (EdScratch)												
	Edison Robot (EdPython)												
	Makeblock mBot (mBlock Scratch)												
	Makeblock mBot2 (mBlock Scratch)												
	Makeblock mBot2 (mBlock Python)												
	VEX Robotics 123												
	VEX Robotics GO (Scratch)												
	VEX Robotics IQ (Python)												
	ZMROBO α Series (Icon Blocks)												
	ZMROBO Defender Wise (Scratch)												
	Open Roberta Lab (Virtual/Blocks)												
	VEXcode VR (Virtual/Blocks)												
	VEXcode VR (Virtual/Python)												

Printed books
Custom editions
Online eBooks
Coming soon

Our coding and robotics material can be used in different grades based on the students' knowledge and experience in technology and the number of teaching hours available in each grade. The matrix above can be fully customized to support the requirements of each school by rearranging the available ebooks for each grade. Open Roberta Lab and VEXCode VR are free online platforms created for schools (*VEXCode VR is free for Scratch coding and has an annual cost for Python coding*). All the robots we support with students' resources and teachers' lesson plans are educational robot kits designed and built for Computing/ICT and STEM projects.



We closely cooperate with leading educational robotics vendors such as HP Robots and ZMRobo to design and deliver updated resources tailored to the educational needs of each age group, while anticipating technological advancements to ensure the content remains relevant and forward-looking.

The idea behind introducing programming at primary and secondary levels is not to create a developer at the age of 12 or 15. We want to help students develop their problem-solving and critical thinking skills, understand how computational thinking can help them solve problems, practice collaboration and communication when working on group activities and projects, and inspire those who may want to become developers through university or college studies. Via programming, students can also understand in a much better way how computers work, why they "misbehave", and what they can do to make them work in a better and more efficient way.

A WIDE RANGE OF AGE-APPROPRIATE CODING/PROGRAMMING TOOLS

In Digital Kids and eSkills for primary schools, we start early in Grades 1 and 2 with basic computational thinking concepts using Digital Kids Go!, our own early-year custom environment, and LOGO. Then we continue with ScratchJr, an icon-based environment without text, and Scratch, an easy-to-use block-based language and a rich and engaging set of libraries that put the fun back into computer programming. With development environments that are easy to master, kids and teenagers are introduced to the world of programming. DK Go!, ScratchJr and Scratch are free to use. Scratch is available for students to download and use at home for Windows, macOS, Android or ChromeOS devices and can also be used online on any computer, tablet or smartphone with a web browser.

In the first part of programming in Digital Teens and eSkills for secondary schools, we use Python, Kodu and Makecode/micro:bit to introduce algorithms. Makecode supports blocks similar to Scratch but also JavaScript and Python code. In Grade 7, we focus on block-based programming to leverage students' knowledge and skills from Scratch. Later, students can work on the micro:bit with Python or even JavaScript. Micro:bit is a programmable hardware device, but the Makecode online platform provides a simulator, and the students can write code that runs on it without cost.

We continue with Python and use Microsoft Visual Code. Python is considered the best choice for any entry-level programming class, and it teaches good programming principles while being incredibly easy to learn. IEEE ACM refers to Python as the most popular programming language for teaching introductory computer science courses in colleges and universities. Teachers can find a wide range of online CPD material and support from the academic community. Python can be used to teach all programming concepts, from simple commands to complex data structures and OOP. The language can be extended

with a wide variety of libraries for anything a developer may need: databases, data analysis, scientific computing, data visualization, machine learning, networking, imaging, gaming, and robotics. Students can write and run Python code on any operating system, including Android (Qpython) and iOS (Pythonista), or even on an online platform (pynative.com, programiz.com, repl.it, pythonanywhere.com).

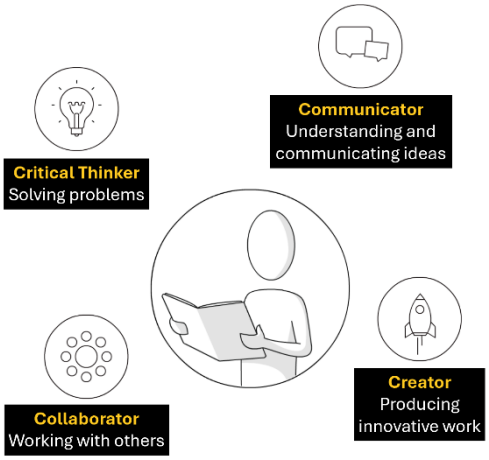
Later, students get an introduction to the Microsoft Visual Studio development environment and learn how to put these easy-to-use tools in Visual Basic to work immediately – creating, compiling, testing, and delivering their first ready-to-use program. Microsoft Visual Basic Express is also free to download and use. We continue with HTML5/CSS3/PHP/JavaScript and MIT App Inventor. HTML5 is the standard markup language used to describe the structure and content of web pages. App Inventor is an online visual programming environment that allows students to build fully functional apps for smartphones and tablets. The Designer and Blocks Editor run completely online in the web browser, and programming is block-based. Students use an Android device simulator or their smartphones or tablets to run and debug an app.

Visual Studio Code is the HTML/JavaScript and Python code editor used in these grades. We have chosen Visual Studio Code (VSC) as this is currently the most popular IDE, running on Windows, macOS, and Linux. VSC correctly highlights the student's code according to the programming or markup language used. VSC provides collaborative coding with the Live Share extension, essential for remote teaching and separated teams. The teacher and the students or the students as project group members can work together, editing and debugging in real-time, with integrated audio and text chat inside Visual Studio Code. VSC will be useful for the students, even in a professional software development setup.

SUPPORT FOR COMPUTER LABS WITH THE LATEST OR OLDER SOFTWARE

The new versions of our Digital Kids, Digital Teens, and eSkills series now include instructions and screenshots for the latest Microsoft Windows and Microsoft Office 365. When we first created our materials, we chose Microsoft Windows 7 and Microsoft Office 2010. This was because, in 2013, we found that most school computer labs were using Windows XP and Office 2007, or even older versions. Windows 7 features were similar to those in Windows XP and Windows 8, and our Office 2010 instructions worked well for those using Office 2007 or Office 2013. This version is still available for schools that can't update their technology often. Our newest edition uses the most recent software to help all schools and keep up with technology advancements.

Our intention is for students to develop 21st-century skills and learn how to use technology correctly to accomplish a task. We do not expect them to memorize buttons and menus that may completely change in the future. If we imagine a student in primary grade 5, it will be 9-10 years before that student will attend a university course or join the workforce. Considering the speed of technology, we do not even know what hardware devices will be like at that time, never mind the software tools. Students must learn how to be flexible and adapt to new working environments.



CONTINUOUS UPDATES OF RESOURCES AS NEEDED

In the Second Edition, we fully updated the materials. It can be challenging to immediately incorporate every change as it occurs in the ever-changing landscape of technology. However, we continuously work to ensure that our resources remain relevant and effective for schools. For this reason, we also provide students with additional ebooks, digital documents, and video tutorials with the latest editions of Microsoft Windows and Microsoft Office on the student's online platform. This allows the teacher to teach with the older tools or choose the latest ones based on what is available in their computer lab. Our teams have access to Technical Preview Editions of operating systems and software tools, allowing us to prepare updated material for schools and universities requiring the latest editions.

FOLLOWING A CAREFULLY DEVELOPED SPIRAL CURRICULUM

Many ICT books on the market were "developed" by copying instructions and details directly from user's manuals or adult training material. In most cases, publishers "teach" Word in one semester and PowerPoint in the following. This is the method IT training companies use to train adults and prepare them for the workforce — no wonder most of us have learned how to use a word processor by ourselves. Many adults trained in these centers can no longer remember what they were "taught" just a few weeks later. Is this the way that we were taught mathematics or science in school?

We use a spiral curriculum in our educational material to revisit basic ideas, building on them until the student has grasped the formal concept. Key features of the spiral curriculum, based on Jerome Bruner's work, are:

- The student revisits a topic, theme or subject several times throughout their school career.
- The complexity of the topic or theme increases with each revisit. The spiral curriculum allows a logical progression from simple to complicated ideas.
- New learning is related to old learning and is contextualized with the old information.
- Each time the student revisits the subject matter, the information is reinforced and solidified.
- Students are encouraged to apply early knowledge to later course objectives.

Our Computing and ICT curriculum uses the spiral approach to ensure that the students fully acquire the knowledge we intend to cover. For this reason, we also use the "Do you remember?" section at the beginning of each module in Digital Kids and eSkills to recycle and review material discussed previously.

ETHICS AND THE CORRECT USE OF AI, INTERNET AND TECHNOLOGY

Our students learn to gather and use information appropriately and ethically and use social media tools to communicate responsibly and safely. Digital Kids and eSkills offer material on the correct use of technology starting from the 1st grade in primary school, and as the students grow up, we discuss these topics in more detail. According to the ISTE Standards for Students that all our resources follow, students:

- Understand human, cultural, and societal issues related to technology and practice ethical behavior.
- Advocate and practice safe, legal, and responsible use of information and technology.
- Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity.
- Demonstrate personal responsibility for lifelong learning.
- Exhibit leadership for digital citizenship.

- Recognize and confront ethical dilemmas in the use of artificial intelligence and make informed decisions based on ethical principles.

Our Computing and ICT series are suitable for any type of school, religious or not. The material is free of references to specific social or cultural issues and is suitable for any student at any age and in any school. At the same time, we teach topics related to the ethical use of technology.

PREPARATION FOR INTERNATIONAL EXAMS

The curriculum provides excellent preparation for international ICT exams for students and young adults: BinaryAcademy TILC, Cambridge ICT Starters, ECDL/ICDL, Certiport IC3, Microsoft Office Specialist and others. We can develop custom material for Ministries of Education, large institutions or organizations that require other international or national CS/ICT exam preparation curricula.

BASED ON INTERNATIONAL STANDARDS APPROVED BY INTERNATIONAL ORGANIZATIONS

Ours is the first global spiral Computing and ICT curriculum that covers all key 21st-century and real-life technology skills. In **May 2014**, the Digital Kids and the Digital Teens series were thoroughly reviewed and awarded the Seal of Alignment with the ISTE Standards for Students. All the series were reviewed again in **2016, 2018** and **2021** and awarded the Seal of Alignment. **In 2023, we underwent another comprehensive review to ensure compliance with the new 2023 ISTE Standards,** covering all the materials of our series, including Can Code and Robotics. The ISTE Seal is renewed every two years as technology moves fast, and technology textbooks cannot be treated like math or science textbooks. We are conducting similar reviews with other international organizations and exam bodies.

Our curriculum is the only complete Computing and ICT solution covering all 12 grades. The latest review report from ISTE can be found here.

ISTE Review Findings

"The Digital Kids/Digital Teens curriculum covers a wide range of topics in Information and Communications Technology. The spiral approach to curriculum design exposes students to topics and technologies repeatedly but in an increasingly detailed and deeper way, which matches the content with students' developmental levels and benefits their construction of knowledge over time from Grades 1-12. The digital tools and software include a variety of products, allowing students and teachers to choose what is available and accessible to them.

Both student books and teaching materials are designed and presented in a clear and detailed way. There are very specific descriptions and vivid visuals in the student books to assist students' learning. Digital versions of student books are available online, so students can access the materials anywhere. There are also a variety of supplementary teaching materials and activities for teachers to use. Teachers have the flexibility to adapt and mix-match the materials according to their needs and can also pick and choose parts of the materials to supplement. Teachers may not use all activities depending on the specific needs and goals of their classroom.

An array of hands-on activities and projects allow students to practice what they have learned throughout the modules. For most projects, group work is encouraged, allowing for a collaborative learning environment for students.

The Digital Kids/Digital Teens curriculum addresses many of the foundational knowledge areas and skills for the ISTE Standards for Students. Given the variety of topics it covers, the curriculum presents a strong example of content that supports the ISTE standards."

International Standards

Our curriculum follows the latest international Computing and ICT teaching standards and promotes the competencies valued worldwide. All our Computing and ICT series follow and comply with the DQ Framework, the basis of the IEEE 3527.1 Standard. This is the world's first global standard for digital literacy, digital skills, and digital readiness – the **IEEE 3527.1 Standard for Digital Intelligence (DQ)** – and was approved by the IEEE Standards Board in September 2020.

Our main curriculum and custom resources are also mapped against national standards and requirements in several countries. The acquired skills reflect the performance standards demanded in an international context, and the material is suitable for international exam preparation. We have extensively researched the latest curriculum frameworks and exam specifications for Computing and ICT from various organizations such as:

- **European Commission** Digcomp 2.2 Digital Competence Framework for Citizens
- **UNESCO** Global Framework of Reference on Digital Literacy Skills
- **UNESCO** AI Curriculum Framework for Students
- **IEEE** 3527.1 Standard for Digital Intelligence
- **International Society for Technology in Education** (ISTE) Standards for Students – Computational thinking competencies
- **K-12 Computer Science Framework** in the USA, developed by CSTA, ISTE and Code.org
- **DQ Institute** (World Economic Forum/IEEE) DQ Global Standards for Digital Literacy, Skills and Readiness

- **Computer Science Teachers Association** (CSTA by ACM) – Model Curriculum for K-12
- **TeachAI** AI Gudiance for Schools Toolkit
- **AI4K12** (Artificial Intelligence for K-12) – K-12 AI Guidelines / 5 Big Ideas in AI
- **UNESCO Institute for IT in Education** ICT Competency Standards for Teachers
- **Cambridge Assessment** International Diploma ICT Starters
- **ECDL / ICDL** Workforce – Professional Syllabi
- **Certiport** IC3 Digital Literacy Syllabus
- **Microsoft** Office Specialist Certification Syllabus
- **UK Department of Education** National Curriculum in England – Computing programmes of study
- **Common Core** State Standards Initiative
- **California Department of Education** Computer Science Standards
- **Singapore Ministry of Education** Baseline ICT Standards
- **Australian Ministry of Education** (ACARA) F-12 Curriculum for Digital Technologies
- **New Zealand Ministry of Education** ICT Strategic Framework in Education
- **Colombia MoE** Estándares básicos de competencias en tecnología e informática
- **American Association of School Librarians** (AASL) Standards for the 21st Century Learner
- **Eurydice ICT@Europe.edu** ICT in European Education Systems & Eurydice Key Competencies
- **CRISS** Digital Competence Assessment Model
- **Microsoft** Digital Citizenship and Creative Content Curriculum
- **International Baccalaureate** PYP/MYP Programmes

While the current set of Computing and ICT curriculum standards is meant to be comprehensive, these standards are also intended to be a living, dynamic document. We periodically review the structure and contents of these standards as the technological context changes and teaching/learning methodologies evolve. Binary Logic not only follows international standards but also actively participates in their development. We are currently a reviewer for the **CSTA K-12 CS Standards 2026 Revision**.

Participating in and influencing the latest trends

We are proud to be a member of:

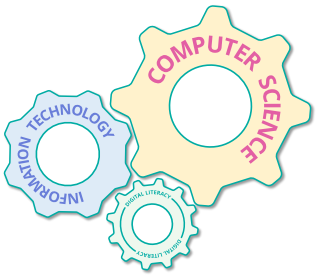
K-12 Standards Reviewer

ISTE Awards Judge
ISTE Community Leader

P1484.20.2	Defining Competencies Standards	P3428	Standard for Large Language Model Agents for AI Education	TG2807.6	Guide for K-12 Educational Knowledge Graphs
P1484.20.3	Standard Data Model for Sharable Competency Definitions	P2247.4	Recommended Practice for Ethically Aligned Design of AI in Adaptive Instructional Systems	TG7004.1	Recommended Practices for Virtual Classroom Security, Privacy and Data Governance
P1484.2	Recommended Practices for Learning and Employment Record (LER) Ecosystems	P2881	Standard for Learning Metadata Terms	TG1589	Augmented Reality Learning Experience Model
P9274.1.1	JSON Data Model Format and RESTful Web Service for Learner Experience Data Tracking and Access	P26516	Design and development of instructional videos and animations	TG7919.1	Requirements for eReaders to Support Learning Applications
P2955	Recommended Practice for Creating Self-Learning Tutorials and Side-by-Side Learning	P3528	Guide for Cyber Informed Engineering Curricula	TG1876	Networked Smart Learning Objects for Online Laboratories
		TG7015	Data and AI Literacy, Skills, and Readiness		

BROAD COVERAGE OF MODERN COMPUTING AND ICT TOPICS

We teach a wide range of modern Computing and ICT topics to support K-12 needs.



Information Technology

- The computer (hardware, peripherals, operating system, file system)
- Word processing (including mathematical equations, envelopes and labels – business documents, reports and forms)
- Spreadsheets (with charts, modeling and data exchange)
- Presentations (with presentation skills)
- Databases (working with various tools to organize information, online forms)
- Multimedia presentations (editing photos, sound, movie clip creation)
- Online communications (blogging, social media, video conferencing)
- Cloud computing and collaboration (online office suites, sharing documents, online meetings, presentation broadcasting, notes management and sharing, mind mapping)
- Modern technology skills (networking, storage and backup, IT troubleshooting, security, cloud storage)
- Advanced technologies (Artificial Intelligence, Machine Learning, Physical Computing & IoT, monitoring and control systems)
- 3D design - Image editing and introduction to 2D animation techniques
- Graphic design and infographics – Web design
- Video editing and introduction to 3D animation techniques
- *Advanced: Engineering design, CAD basics, System life cycle*

Digital Literacy

- Online essentials and information literacy (web surfing/searching, email, calendar and contact management, safe computing)
- Digital citizenship (e-safety, data privacy, personal health, environment, ethics and intellectual property)
- Data protection (Cybersecurity essentials)

Computer Science

- Computer Science concepts (computer systems and networks)
- Computational thinking – Coding & programming (Unplugged, algorithms, block- or text-based)
- Robotics (building and coding) – Virtual robotics
- Designing and developing software applications (desktop or mobile)
- Introduction to game development
- Building websites (with online apps and later with HTML/CSS/JS tools)
- Introduction to Data Science
- Introduction to the Internet of Things (IoT)
- Introduction to Software Engineering
- Introduction to Digital Circuits
- *Advanced: Data Science (Python), Engineering Essentials (Electrical and digital circuits), Physical Computing & IoT circuit design and programming (Blocks, Python, C++), Artificial Intelligence (Python), Cryptography for Cybersecurity (Python), Networking Basics for Cybersecurity, Software Engineering Principles, UX/UI Principles*

Entrepreneurship

- Project planning and diagramming
- Business documents and forms (desktop publishing, data collection)
- E-commerce and digital marketing

CROSS-CURRICULUM SUPPORT FOR OTHER SUBJECTS

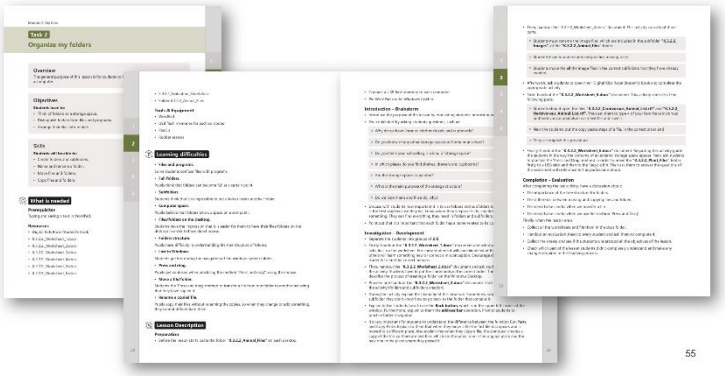
Our content is aligned with student needs in each age group, and most activities are based on the school subjects taught in each grade. We provide cross-curricular activities on topics discussed in math, science, geography, history, art etc., in the respective grade of the student at school.

ACTIVITIES FOR BOYS AND GIRLS

Projects and topics are carefully considered to be inclusive to both genders. ISTE Review Findings - May 2014: *"Overall, the materials and learning strategies are of high quality and cover a wide range of topics and technologies. They are attractively designed, logical, constructivist, **gender-sensitive** and **age-appropriate**. The activities are clear, concise and accurate without being over-simplified, and are presented in a way that is consistent with the spirit of the ISTE Standards for Students."*

TEACHER'S GUIDES FOR NOVICE AND EXPERIENCED TEACHERS

The step-by-step Lesson Plans in the Online Teaching Resources are the "Teacher's Guide" with everything the teacher may need for each lesson. They are updated continuously based on teachers' feedback, technology changes, and technology trends in Computing and ICT teaching.



TEACHER TRAINING FOR ICT AND COMPUTER SCIENCE TEACHERS

We provide pre-service and in-service teachers with professional development support to utilize our educational solutions in K-12 and higher education. Our trainers have considerable experience in Latin America, the Middle East and Asia.

We aim to improve teachers' practice in all areas of their work. An educational institution is a learning organization where everyone must continue learning. This includes teachers, who should continue learning more about the subjects they teach and techniques for teaching those subjects. Our training sessions support teachers' professional development by combining our material with emergent views in pedagogy, curriculum, and class organization.

We know that there are Computing and ICT teachers, especially newly graduated teachers without any previous experience, who, despite being technology experts, have not yet acquired the required teaching skills. For this reason, we have prepared teaching courses to help these inexperienced and experienced teachers looking for new ideas. Our training includes:

- Pedagogical background
- Teaching methodology
- Lesson management

- Class management
- Evaluation/assessment strategies
- Model lessons

Our typical Teacher Training Course has two main parts. The first part addresses the overall structure of the student and teacher materials of the Computing and ICT series published by Binary Logic: Digital Kids, Digital Teens, eSkills, Digital World and Binary ICT Skills. It also explains the components, instructional style, and lesson pedagogy and offers suggestions regarding effective use of the materials.

The second, perhaps more important part, provides teacher training for those who may have deep knowledge and skill in computers and technology, such as IT graduates or professionals who are less familiar with teaching students in a school environment. Practical tips, best practices and helpful advice are provided on classroom management, student behavior management in the computer lab, time allocation, lesson planning, managing assignments, and assessment strategies. This will also benefit those teachers who may have experience teaching elementary students but not secondary and vice versa.

The teachers get a Teaching Computing & ICT Certificate from BinaryAcademy at the end of the training course.

Follow us for the latest news, or contact us for more information:

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