Pearson
Edexcel

Your guide to Pearson Edexcel International GCSE (9–1)

Computer Science and Information and Communication Technology (ICT)

First teaching
September 2017

Welcome

Our new suite of Pearson Edexcel International GCSE (9–1) qualifications has been refreshed to meet the needs of you and your students, to keep the content up-to-date and relevant. Designed to understand today's global learner, respect local contexts and ensure a global standard, the suite has been developed to align with UK government intentions to raise standards.

This guide has been designed to provide you with in-depth information about the key features of the new Pearson Edexcel International GCSE (9–1) Computer Science and ICT specifications, available for first teaching in September 2017.

Before we go into detail about Computer Science and ICT, we wanted to give you an overview of what the changes to the Pearson Edexcel International GCSE (9–1) suite of qualifications are.

Why choose Pearson Edexcel International GCSE (9–1)?

With over 3.4 million students, in 97 countries, studying Pearson qualifications worldwide, we offer internationally recognised qualifications to schools, colleges and employers globally. We are also the UK's largest academic and vocational Awarding Organisation.

Our new suite of International GCSE (9–1) qualifications is designed to:

Be more relevant for international students

With more international content, including the addition of further international content topics and the use of local contexts where possible.

Reward outstanding academic achievement

By introducing a new 9–1 grading scale, with the new grade 9 representing a new level of attainment, you can differentiate your top performing students. There's also greater differentiation in the middle of the scale, with three grades (6, 5, and 4) rather than two grades (B and C).

Contain embedded transferable skills

Developing skills such as problem-solving and verbal reasoning, skills that are valued by universities and employers, supporting students to seamlessly progress to higher-level study.

Provide detailed exam analysis with ResultsPlus

ResultsPlus is a service unique to Pearson that provides free online in-depth mock and actual exam performance analysis, supporting teachers to plan improvements in teaching and learning, driving attainment.

Offer a wider range of teaching and learning materials, resources and training

This support includes schemes of work, Getting Started guides, exemplar materials, ExamWizard, comprehensive textbooks and interactive resources, digital services and tailored teacher training.

Support progression to further study

Developed with the help of teachers and higher-education representatives, they provide seamless progression to further study, including A levels and beyond.

A CBI Report stated that

"Teaching programming and computer science in much greater depth will expand understanding of the digital world ... encouraging the development of the active, creative interactions with technology that will be fundamental to economic success in the 21st century. Employers need people who are not only effective users of technology, but also able to innovate with it. Part of this goes beyond technical skills to the behaviours and competencies that are in part developed by engaging with the digital creative process"

Source: CBI response: UK Digital Skills Taskforce – Call for Evidence, May 2014

Why choose Pearson Edexcel International GCSE (9–1) Computer Science and ICT qualifications?

We listened to feedback from all parts of the international school community, including a large number of teachers. The changes we've made will engage students and give them skills that will support progression to further study of Computer Science and ICT, plus a wide range of other subjects.

Clear and straightforward question papers

Our question papers are clear and provide sufficient challenge and support for students of all ability ranges. Our mark schemes are straightforward so that the assessment requirements are clear.

Reward outstanding academic achievement

To ensure that we fully align with UK government intentions to raise standards, and that international students have the same opportunity to be rewarded for outstanding academic achievement, our new qualifications use a new 9–1 grading scale, instead of the A*–G grading scale that you are used to.

- The new grade 9 represents a new level of attainment and has been introduced to differentiate your top performing students.
- The bottom of the grade 7 broadly aligns with the bottom of the grade A.
- There is also greater differentiation in the middle of the scale with three new grades (6, 5 and 4) rather than two grades (B and C).
- The bottom of the grade 4 broadly aligns with the bottom of the grade C.
- The bottom of the grade 1 broadly aligns with the bottom of the grade G.

Comparable to GCSE

We have designed our Pearson Edexcel International GCSE (9–1) Computer Science and ICT qualifications to be of a broad equivalent standard to Pearson's regulated Edexcel GCSE qualifications. This ensures that Pearson Edexcel International GCSEs (9–1) are recognised globally and provide learners with the same progression routes.

Support progression to A Level

Our Pearson Edexcel International GCSE (9–1) Computer Science and ICT qualifications enable successful progression to A Level and beyond. Through our world-class qualification development process, we have consulted with International Advanced Level and GCE A Level teachers, as well as university professors, to validate the appropriateness of this qualification including the content, skills and assessment structure.

At Pearson Edexcel, we provide Computer Science and ICT International GCSE (9–1) qualifications to offer teachers the choice and flexibility to select a specification that best meets the needs of their learners.

Why choose Pearson Edexcel International GCSE (9–1) Computer Science?

- **Develop computational thinking skills:** This qualification provides students with the opportunity to operate confidently in today's digital world, enabling students to apply computational thinking in context, across both written and practical examinations.
- **Provide practical opportunities:** Students will be encouraged repeatedly to design, implement and test programs that provide solutions to problems. They will apply their skills to produce robust programs and this will help them to progress to further/higher education where practical knowledge and experience will be required.
- **Develop a range of programming languages:** We will provide a choice of three programming languages, allowing flexibility for centres and students to make choices that are the most valuable and appropriate for them.
- **Broad and deep development of students' skills:** The Pearson Edexcel International GCSE (9–1) is designed to extend students' knowledge and understanding by broadening and deepening skills. For example, students will develop the ability to:
    - apply the fundamental principles and concepts of computer science, including abstraction, decomposition, logic, algorithms and data representation
    - analyse problems in computational terms through practical problemsolving experience. This will include designing, writing and debugging programs
    - think creatively, innovatively, analytically, logically and critically
    - apply mathematical skills relevant to computer science.

At a glance: New Pearson Edexcel International GCSE (9–1) in Computer Science

Paper 1: Principles of Computer Science

- External assessment (2 hours).
- 50% of total marks.
- This paper will assess all topics:
  - Understanding of what algorithms are, what they are used for and how they work; ability to interpret, amend and create algorithms.
  - Understanding the requirements for writing program code.
  - Understanding how to develop program code and constructs, data types, structures, input/output, operators and subprograms.
  - Understanding of binary representation, data representation, data storage and compression, and encryption.
  - Understanding of components of computer systems; ability to construct truth tables, produce logic statements and read and interpret pseudocode.
  - Understanding of computer networks, the internet and the world wide web.
  - Awareness of emerging trends in computing technologies, the impact of computing on individuals, society and the environment, including ethical, legal and ownership issues.
- The paper consists of multiple-choice, short openresponse, open-response and extended open-response answer questions.

Paper 2: Application of Computational Thinking

- External assessment (3 hours).
- 50% of total marks.
- This paper is practical and will also test students' knowledge and understanding of the topics. This paper will draw on:
  - Understanding of what algorithms are, what they are used for and how they work; ability to interpret, amend and create algorithms.
  - Developing and testing program code and constructs, data types, structures, input/output, operators and subprograms.
  - Connecting and using data sources when developing program code.
  - Understanding of binary representation, data representation, data storage and compression, and encryption.
  - Ability to construct truth tables, produce logic statements and read and interpret pseudocode.

Feedback from teachers on the Computer Science specification

The model prepares the learners with the requisite skills for the 21st century. This qualification supports two tier progression routes. a) towards further/ higher education – A Levels then University.
b) towards vocational route where it equips learners with skills needed in the modern marketplace.

It's a good foundation for students who wish to pursue a career in computer science.

Dr. Moses Waigwa (International Teacher), Head of ICT at Oshwal Academy Nairobi - Senior High, Kenya.

Nice to see the practical have the same weighting as the theory. Bringing questions of theory into the practical through the problems they are asked to solve is a neat trick.

Dave Oxley, Head of Quality, Intel Security.

I think that the assessment model is actually very creative, especially paper 2. I like that each paper has a 50% weight to the overall mark. Other exam boards have weighted the practical elements a lot less. In my opinion the specification covers just the right amount of content for students at this age to engage and find interest.

Mark Wood, Subject Leader: ICT & Computer Science, Dubai College, UAE.

This is a good way of teaching and testing students' understanding of programming concepts, syntax and logical thinking – if they are good at writing pseudo code then programming in different languages should not be problem in principle.

Serengul Smith, Associate Professor- Computing Science & Multimedia Technology, Middlesex University, UK.

“It is like a global passport - it offers me worldwide recognition and I can go anywhere with my Edexcel qualifications...I would definitely recommend Edexcel.”

Nikita Jha, Edexcel International GCSE student at Sayfol International School, Malaysia.

Illustration by by Davide Bonnazi

Why choose Pearson Edexcel International GCSE (9–1) ICT?

- **Developing confident and competent ICT users:** This qualification provides students with the opportunity of operating confidently in today's digital world. It is a useful, practical qualification which will provide skills needed in further education and work.
- **Providing students with relevant and transferable skills:** Students will learn about topics ranging from digital devices and connectivity, safe and responsible practice, and understand the impact of internet on the way that organisations do business. They will be also be encouraged to practice using software applications effectively.
- **Broad and deep development of students' skills:** The design of the new Pearson Edexcel International GCSE (9–1) aims to extend students' knowledge and understanding by broadening and deepening skills. For example, students develop the ability to:
    - apply knowledge and understanding to produce Information and Communication Technology-based solutions
    - develop skills of analysis and evaluation, making reasoned judgements and presenting conclusions
    - reflect critically on their own and others' use of Information and Communication Technology and to adopt safe, secure and responsible practice.

At a glance: New Pearson Edexcel International GCSE (9–1) in ICT

Paper 1: Written paper	Paper 2: Practical paper
• External assessment (1 hour 30 mins). • 50% of total marks. • Students must study all of the following topics: - **Topic 1:** Digital Devices. - **Topic 2:** Connectivity. - **Topic 3:** Operating Online. - **Topic 4:** Online Goods and Services. Students will: - Gain knowledge and understanding of Information and Communication Technology. - Develop skills to apply knowledge and understanding to produce ICT-based solutions. - Develop skills of analysis and evaluation, making reasoned judgements and presenting conclusions. • The examination comprises a mixture of multiple-choice, short- and long-answer questions.	• External Assessment (3 hours). • 50% of total marks. • Students must study both of the following topics: - **Topic 5:** Applying Information and Communication Technology. - **Topic 6:** Software Skills. Students will: - Gain knowledge and understanding of Information and Communication Technology. - Develop skills to apply the knowledge and understanding they acquire in all topics (1–6) to produce ICT-based solutions. - Develop skills of analysis and evaluation, making reasoned judgements and presenting conclusions. • The examination comprises one practical assignment.

Feedback from teachers on the ICT specification

The fast changing nature of ICT has been recognised and learning outcomes have been selected with the aim that they will remain relevant for several years.

It provides opportunities for contextualised learning and the content has been created to suit a wide variety of schools, avoid cultural bias and develop essential lifelong skills, including creative thinking and problem-solving.

The specification is more specific than before which is a great improvement. The Sample Assessment Materials are more convenient than before as questions and answers are given together.

Shammi Choudhary, L3 teacher ICT Bangladesh International Tutorial, Bangladesh.

This assessment model covers the most current technological developments in the computing field especially the digital devices. The questions are well- balanced covering most, if not all aspects in knowledge, understanding and skills in both papers 1 and 2.

Thaddeus Kinene Gaitho, Head of Department, Oshawal Academy Nairobi, Kenya.

The differences between Pearson Edexcel International GCSE (9–1) Computer Science and ICT

Computer Science and ICT are unique yet complementary subjects serving distinct purposes. Pearson Edexcel offers International GCSEs (9–1) in both because:

- schools wishing to teach students how to use computer systems safely and effectively should opt for the International GCSE in ICT
- schools who want their students to study computation and learn how it can be applied to solving problems should choose the International GCSE in Computer Science
- should a student wish to do so, they can study both qualifications.

Your guide to assessment timelines

The table below shows each assessment opportunity for Pearson Edexcel International GCSE (9–1) Computer Science and ICT specifications*.

	May/June 2018	May/June 2019
Legacy specification: 4IT0	Assessment window	Not available
New specification: 4IT1 4CP0	Not available	May/June series available (first assessment window for all centres)

*Timelines may vary for UK centres.

Developing transferable skills valued by universities and employers

In recent years, universities and employers have highlighted the need for students and graduates to develop a range of transferable skills, often referred to as 'soft skills', to enable them to better meet the demands of undergraduate study and the world of work.

In fact, universities and employers consider transferable skills to be the largest skills gap overall.

1 in 6

employers have difficulty finding candidates with the skills they require[1]

54%

of companies say that skills shortages impact their ability to serve their customers[2]

1 in 3

skills in a job posting is a "soft skill"[1]

87%

of university professors do not think students have the research skills needed for degree-level study[3]

Redeveloping our International GCSEs has ensured we meet the needs of today's learners to support their progression to universities and employment worldwide. We've embedded transferable skills in the qualifications and resources. This means teachers help students develop these skills while they teach, rather than having to add something additional to their lessons, and students are aware of the skills they're developing. These skills are highly valued by universities and employers.

[1] *Employability - Personal & Social Capability Framework report from Pearson, 2016.*
[2] *Employability report from PSB for Pearson, 2016.*
[3] *Bridging the Gap: Understanding the Differing Research Expectations of First-Year Students and Professors, Meg Raven, Mount Saint Vincent University, 2016.*

Supporting you at every stage

We provide an unparalleled level of support services, tools, resources and training alongside our qualifications, making teachers and students lives easier at every stage.

At a glance: support for you at every stage			
FREE resources and support	**Planning, teaching & learning**	**Exam preparation and assessment**	**Results support**
Getting started guide	✓		
Training events (face-to-face and online)	✓		
Subject advisor support	✓	✓	✓
Community forums	✓	✓	✓
Schemes of work	✓		
Lesson Plans	✓		
Skills mapping	✓		
Sample assessment materials	✓	✓	
Examiner reports	✓	✓	✓
Exemplar marked responses	✓	✓	
Past papers		✓	
ResultsPlus mock exam analysis		✓	
ResultsPlus		✓	✓
Access to Scripts service (ATS)			✓
Additional online teacher materials	✓	✓	
Additional paid for resources			
Curriculum-matched Student Books with ActiveBooks*	✓	✓	
Online Teacher Resource Pack*	✓	✓	

*Available for Pearson Edexcel International GCSE (9–1) ICT

Your free subject support

- **Our subject advisors** provide fast, reliable, expert help and aim to answer all emailed questions within 48 hours and resolve 90% of issues phoned in on the first call. Email **TeachingICT@pearson.com** or **TeachingComputerScience@pearson.com** or call **+ 44 (0)20 7010 2161**
- **Connect with other educators around the world**, share ideas and resources and stay up to date with the latest subject developments by joining our international schools community at **community.pearsoninternationalschools.com**

Offering more advanced support services and tools

Our technology capability also allows us to provide the following unique services and tools to teachers and students:

ResultsPlus provides detailed information on exam performance and a platform to view and compare student results – as individuals or as groups – across the world. It helps with planning improvements in teaching and learning. ResultsPlus Direct is a free online service that gives students a detailed breakdown and comparison of their performance in Pearson Edexcel exams, globally, to help them identify areas of improvement.

examWizard is our free exam preparation tool containing a bank of past Pearson Edexcel exam questions, mark schemes and examiners' reports for a range of subjects. It saves you time by enabling you to create your own mock exams, topic tests, homework or revision activities in minutes and links directly to associated examiner reports and mark schemes!

Access to Scripts Service (ATS) is an online service which allows access to view electronically marked exam papers, free of charge, providing enhanced transparency and support for teachers to evaluate a student's performance on particular questions in relation to what they have been taught.

Awarding reliability. We use ePEN, our unique, image-based marking system ensuring real time monitoring, quality control and reporting to ensure the highest quality marking and provision of data for tools such as ResultsPlus. Pearson Edexcel exam marking processes have been proven to produce the most reliable results. This demonstrates that our qualifications maintain the highest standards and can be relied upon to deliver to expectation.

Stay Informed

Sign up for regular eNews updates for the latest news and information on your subject **quals.pearson.com/edexcel-internationalgcseenquiry**

Feedback from teachers on our qualifications support

> One of the good features of ResultsPlus is that it provides the top ten questions that students scored poorly in, so we as the lecturers can actually identify the topics that students found difficult and can incorporate a different approach when teaching our current students.

Dr Khong Yoke Kum, Chemistry Lecturer,
A levels Department, HELP Academy, Malaysia.

> Because of ResultsPlus, students can learn about their mistakes and rectify.

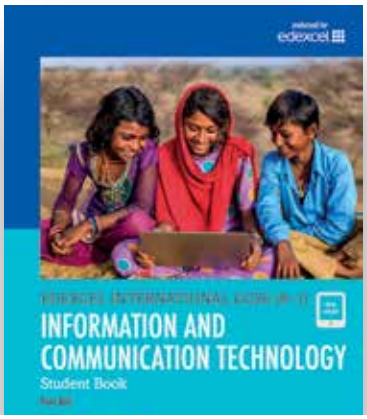
Kanagambigai, Chief Counsellor,
Chemistry Lecturer, A levels Department,
HELP Academy, Malaysia commenting on
the ResultsPlus mocks service.

> I used the website with its course outlines, past papers, summaries of key points, revision notes and mark schemes... they provide great tips about possible exam questions and how you could answer them.

Alexia Kattavenos, student, The Nicosia Grammar School, Cyprus

Published resources

Developed for the new Pearson Edexcel International GCSE (9–1) ICT specification, this completely new Student Book has progression, international relevance and support at its core.



Specifically developed for international learners, with appropriate international content.

The **new 9–1 grading scale** ensures a consistent international standard of qualification, allowing learners to progress further and achieve their full potential.

The Student Book will provide access to an **ActiveBook**, a digital version of the Student Book, which can be accessed online, anytime, anywhere, ideal for learning beyond the classroom, revision and exam practice.

Transferable skills, needed for **progression** into higher education and employment, are embedded throughout and explicitly signposted, allowing students to understand, and engage with, the skills they're gaining.

English language focused content, checked by an EAL (English as an Additional Language) specialist, addresses the needs of EAL students with carefully graded writing to B2/C1 level (CEFR) and a glossary provided of specialist vocabulary and terminology.

Chapters are mapped closely to the specification to provide comprehensive coverage and **Chapter summaries** state the most important points in each chapter and aid revision.

Exam Practice tests and exam-style questions cover the whole chapter and provide quick, effective feedback on students' progress and gets them accustomed to what they'll see in the exam.

Accompanying teacher support materials are available online.

You do not have to purchase our published resources, or endorsed resources from any other publisher, to deliver our qualifications. For details of all available published resources, please visit qualifications.pearson.com

Pearson Edexcel International GCSE (9–1) ICT

Title	ISBN
ICT Student Book and ActiveBook	978 0 435188 93 1
ICT Online Teacher Resource Pack	978 0 435191 36 8

Learn more at www.pearsonglobalschools.com

> **I decided to take Edexcel International GCSEs as they are accepted by institutions around the world for higher studies. The course is modern, well structured & examinations based. Thanks to my ever supporting parents, school, teachers and Edexcel for helping me to gain a world-class qualification.**

Ashfaq Faiz, Riyadh, Saudi Arabia

About Pearson Edexcel

At the core of everything we do at Pearson is the desire to make a measurable impact on improving people's lives through learning. From primary school to secondary school, through to professional certification; our qualifications help educate millions of people worldwide.

Foundations for success

Pearson Edexcel International GCSE (9–1) is part of the iProgress family for ages 5 to 19, which also includes iPrimary, iLowerSecondary and International A Level (IAL). We offer more than just a qualification. With professional development training that keeps teachers up-to-date with the latest educational practices, supporting materials that make planning and teaching lessons easier, and student textbooks and online resources, you'll have more time to focus on the individual development of your students' progress.

Progress to further study and beyond

Developed with the help of teachers and higher-education representatives, they provide seamless progression to further study, including A Levels and beyond.

Find out more

To find out more about our Pearson Edexcel International GCSE (9–1) qualifications, visit our website,
quals.pearson.com/edexcel-internationalgcse

Or complete our online form to request a local consultant to contact you,
quals.pearson.com/edexcel-internationalgcseenquiry

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