THE JCB ACADEMY

CURRICULUM OPTIONS

Y10

2024/25

INTRODUCTION

This booklet contains brief details of each of the options available at The JCB Academy for Y10 learners in the 2024/25 academic year.

All learners will study the subjects listed below which are equivalent to six GCSEs overall:

- English Language (GCSE)
- English Literature (GCSE)
- Mathematics (GCSE)
- Business (GCSE)
- Engineering Design (Level 2)[1]
- Engineering Manufacture (Level 2)[1]
- Physical Education (non-examined)
- Practical Skills (non-examined)

The remainder of the curriculum is split up into pathways with options A to K (shown on the next page) available to be chosen by learners. These options are based primarily around triple science (separate sciences, worth three GCSEs) and combined science (worth two GCSEs), with one or two additional options available depending on the pathway chosen. In total, learners can choose to do between eight and ten GCSEs or equivalent qualifications depending on the science pathway and options chosen.

Further details on the GCSE and Level 2 qualifications that are available as optional subjects are shown on the following pages.

[1] *Level 2 qualifications are vocational subjects that are equivalent to a GCSE*

Triple Science

(Separate sciences, Biology, Chemistry and Physics, worth 3 GCSEs)

Plus **one additional subject** from the options below

Option A	Option B	Option C	Option D
Enterprise	Computer Science	Programmable Systems	Engineering*
10 GCSEs in total	**10 GCSEs in total**	**10 GCSEs in total**	**9 GCSEs in total**

*Not a GCSE or L2 qualification

Suitable for leaners with a MEG of 55 or above in science and 5 or above in maths who are making progress that is on or above expectation at this stage.

Combined Science

(Biology, Chemistry and Physics combined, worth 2 GCSEs)

Plus **two additional subjects** from the options below

Option E	Option F	Option G	Option H	Option I	Option J	Option K
Enterprise	Enterprise	Enterprise	Sport*	Sport*	Sport*	Literacy*
✚	✚	✚	✚	✚	✚	✚
Programmable Systems	Computer Science	Engineering*	Computer Science	Programmable Systems	Engineering*	Engineering*
10 GCSEs in total	**10 GCSEs in total**	**9 GCSEs in total**	**9 GCSEs in total**	**9 GCSEs in total**	**8 GCSEs in total**	**8 GCSEs in total**

*Not a GCSE or L2 qualification

SCIENCE GCSE PATHWAYS

TRIPLE SCIENCE

Learners who choose to do triple science (known formally as Triple Award Science) will study three separate science subjects: biology, chemistry and physics.

Each subject is taught and examined individually and learners receive three separate GCSE qualifications, one in each of these sciences.

Learners will gain an in depth and broad understanding of each of the separate sciences with opportunities to explore scientific concepts to a deeper level.

Triple science is often recommended for learners who are considering pursuing science subjects at A-Level and beyond, as it provides a strong foundation in each discipline.

This option is suitable for learners with a MEG of 55 or above in science and 5 or above in mathematics who are making progress that is on or above expectation at this stage. Please refer to your son's/daughter's most recent report for more details.

COMBINED SCIENCE

Combined science is an alternative to triple science where learners study an integrated science curriculum covering biology, chemistry and physics, but in less depth.

This route results in two GCSE grades that are an average of the performance across all three sciences.

Learners with GCSEs in combined science can progress to A-Levels in all of the three natural science subjects, subject to meeting the relevant entry criteria.

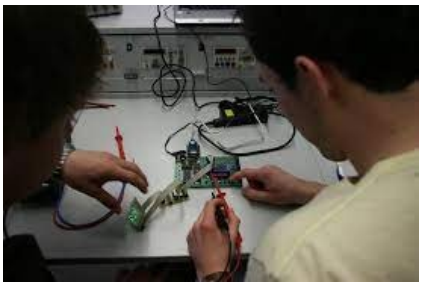
This option is suitable for all learners.

OPTION SUBJECTS *(GCSE or Level 2 qualifications)*

PROGRAMMABLE SYSTEMS

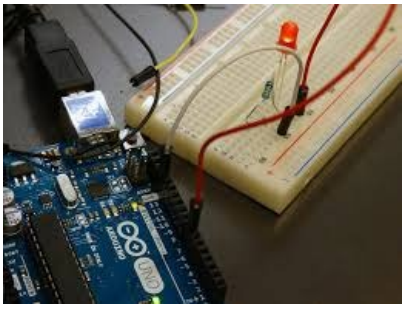
The Level 2 OCR Cambridge Nationals in Engineering Programmable Systems is designed for learners who wish to explore electronic products and systems. The course is suited to learners who enjoy studying the principles of electronics, making and testing circuits and programming systems.

The course aims and objectives are to:



- Understand and apply the fundamental principles and concepts of engineering programmable systems, including the principles of electronic circuits, the components and devices used in electronic and programmable systems and how to construct and test them.
- Develop learning and practical skills that can be applied to real-life contexts and work situations.
- Think creatively, innovatively, analytically, logically and critically.
- Develop independence and confidence in using skills that would be relevant to the maintenance, installation and repair sector and more widely.
- Use computer aided design (CAD) software to produce diagrams and simulate circuits.
- Construct and test electronic circuits for a specific purpose, using tools and equipment to assemble printed circuit boards.
- Solve problems using microcontroller programs to develop programmable systems and test that they solve such problems.

Coursework units:
R048 Making and testing electronic circuits (30%)
R049 Developing programmable systems (30%)



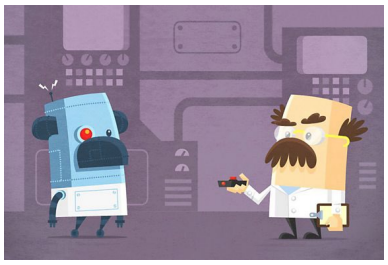
Examined units:
R047 Principles of electronic and programmable systems (40%)

COMPUTER SCIENCE

This option provides learners with the opportunity to investigate how computers work and how they are used.

During the course, learners will develop computer programming and problem-solving skills that are vital to any computer scientist, applying computational thinking to find ways that computers can help solve the problems we face.

Learners will study the following topics:



3.1 Fundamentals of algorithms
3.2 Programming
3.3 Fundamentals of data representation
3.4 Computer systems
3.5 Fundamentals of computer networks
3.6 Cyber security
3.7 Relational databases and structured query language (SQL)
3.8 Ethical, legal and environmental impacts of digital technology on wider society, including issues of privacy

Paper 1:
Computational thinking and programming skills (2 hour written exam, 90 marks, 50% of GCSE)

What's assessed? Computational thinking, code tracing, problem-solving, programming concepts including the design of effective algorithms and the designing, writing, testing and refining of code.

The content for this assessment will be drawn from subject content 3.1 and 3.2 above.

Question types. A mix of multiple choice, short answer and longer answer questions assessing programming, practical problem-solving and computational thinking skills.

Paper 2:
Computing concepts (1 hour 45 minutes written exam, 90 marks, 50% of GCSE)

What's assessed? The content for this assessment will be drawn from subject content 3.3 to 3.8 above.

Question types. A mix of multiple choice, short answer, longer answer and extended response questions assessing SQL programming skills and theoretical knowledge.

ENTERPRISE

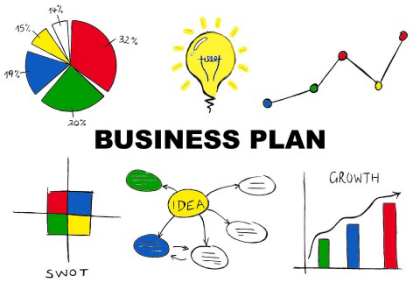
Enterprise is an important part of the business sector and plays a major role in the UK's global economic status. The role of entrepreneurs is to help create wealth for the nation and its citizens through the creation of enterprises that innovate and grow the economy. Small and medium-sized enterprises (SMEs) account for 99.9% of the business population in the UK, three-fifths of employment and around half of the turnover in the UK private sector, worth around £2.2 trillion.

This qualification is designed to provide learners with the opportunity to expand their business knowledge by studying a second qualification alongside GCSE Business. Study of this sector at Key Stage 4 will complement studies by providing an opportunity for practical application alongside conceptual study.

The units that are covered are valued as a percentage of the final grade and are as follows:

Coursework Units:

Component 1: Exploring Enterprises (30%). Learners will explore different enterprises to develop their knowledge and understanding of the characteristics of enterprises and the skills needed by entrepreneurs to be successful. Learners will explore how enterprises use market research to find out about their customer needs and competitor behaviour and how internal and external factors may affect enterprises.



Component 2: Planning and Presenting a Micro Enterprise Idea (30%). Learners will generate two realistic ideas for a micro enterprise and choose one of these to plan within budget. They will individually present their business plan for their idea and review the production and delivery of their presentation to make recommendations for improvements.

Examined Unit:

Component 3: Marketing and Finance for Enterprise (40%) - exam two hours. Learners will explore how marketing is used by enterprises and the factors that influence how enterprises identify and target their market. Learners will complete financial documents and statements and explore how to use them to monitor and improve the performance of an enterprise in order to make decisions and recommend strategies for success.

OPTION SUBJECTS *(not GCSE or Level 2 qualifications)*

ENGINEERING

The engineering option gives learners the opportunity to further improve their knowledge and understanding of the key concepts underpinning the two main engineering qualifications: engineering manufacture and engineering design.

The time available will be used to consolidate and improve coursework for these qualifications with support and interventions available.

LITERACY

The literacy option is designed for learners who have low-level literacy skills. The available time will be used to focus on improving each learner's reading, spelling and use of grammar, with the expectation that this will help lead to improvements across all subjects.

Although this is an option subject which can be chosen by learners who want to improve their overall literacy skills, it is important to note that this subject is often chosen for some learners based on the outcomes of prior assessments. The results of in class assessments, GL assessments, the reading and spelling tests will be used to determine if learners should do this option.

SPORT

This option will allow learners to access the benefits that come from participating in sports and physical activity, including increasing their confidence, resilience and general improvements to both physical and mental health.

Although not formally delivered as a qualification, learners who choose this option will have access to completing a sports leadership programme over the course of the two years. This programme uses sport and physical activity to develop the essential skills needed to plan, develop and deliver activities. These are essential skills that are of benefit to all learners regardless of their future pathway.