



Science and Innovation

Vocabulary Long List

Topic vocabulary, useful phrases, phrasal verbs and idioms | Cambridge IGCSE ESL

<p>1 Learn by theme Study one table at a time.</p>	<p>2 Notice combinations Learn complete phrases, not isolated words.</p>	<p>3 Use the examples Adapt each sentence for speaking or writing.</p>
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Scientific research

Word or phrase	Meaning	Example sentence
scientific research	systematic study intended to develop knowledge	Scientific research can lead to new treatments.
research question	the specific question a study aims to answer	A clear research question guides the investigation.
hypothesis	a testable explanation or prediction	The experiment supported the original hypothesis.
collect data	gather information for analysis	Researchers collected data from several schools.
analyse results	examine findings carefully to understand them	Scientists analysed the results before publishing.
reliable evidence	information that can be trusted because it was gathered carefully	Decisions should be based on reliable evidence.

Experiments and laboratories

Word or phrase	Meaning	Example sentence
experiment	a controlled test used to discover or demonstrate something	The experiment measured how temperature affected growth.
laboratory	a place equipped for scientific work	Samples were tested in the laboratory.
control variable	a factor kept the same during an experiment	Light was a control variable in the study.
accurate measurement	a measurement close to the true value	Accurate measurement is essential in chemistry.
safety procedure	an established action intended to prevent harm	Everyone followed the laboratory safety procedures.
repeat a test	perform a test again to check the result	Scientists repeat a test to improve reliability.



SCIENCE AND INNOVATION | CORE VOCABULARY

Inventions and design

Word or phrase	Meaning	Example sentence
invention	a newly created device, process or idea	The invention made clean water easier to access.
prototype	an early model used for testing	Engineers improved the prototype after user feedback.
design process	the stages used to develop a product or solution	Testing is an important part of the design process.
solve a problem	find an effective answer to a difficulty	The team designed a device to solve the problem.
patent	a legal right protecting an invention	The inventor applied for a patent.
practical application	a real-world use of an idea or discovery	The material has several practical applications.

Discovery and progress

Word or phrase	Meaning	Example sentence
discovery	something found or learned for the first time	The discovery changed our understanding of the disease.
scientific breakthrough	an important advance in knowledge or technology	The vaccine was a major scientific breakthrough.
make progress	improve or move closer to a goal	Researchers are making progress in battery technology.
develop a theory	create an explanation supported by evidence	Scientists developed a theory from repeated observations.
peer review	evaluation of research by other experts	Peer review helps identify weaknesses in a study.
publish findings	make research results publicly available	The team published its findings in a journal.



SCIENCE AND INNOVATION | CORE VOCABULARY

Space exploration

Word or phrase	Meaning	Example sentence
space exploration	investigation of space using people or technology	Space exploration has improved knowledge of the solar system.
satellite	an object placed in orbit around a planet	The satellite collects weather data.
spacecraft	a vehicle designed to travel in space	The spacecraft carried instruments to Mars.
orbit	the curved path of an object around another object	The telescope was placed in orbit.
astronaut	a person trained to travel and work in space	Astronauts conduct research in difficult conditions.
mission	an organised journey with a specific scientific purpose	The mission aims to collect rock samples.

Medicine and biotechnology

Word or phrase	Meaning	Example sentence
medical research	scientific study intended to improve health and treatment	Medical research has increased survival rates.
treatment	medical care used to improve an illness or injury	The new treatment reduced symptoms.
vaccine	a substance that prepares the immune system to resist a disease	Vaccines can prevent serious illness.
clinical trial	a study testing a medical treatment with people	The medicine entered a large clinical trial.
genetic information	biological instructions carried in DNA	Genetic information can help researchers understand some diseases.
diagnostic tool	equipment or a method used to identify a condition	The scan is a valuable diagnostic tool.



SCIENCE AND INNOVATION | CORE VOCABULARY

Digital and emerging technology

Word or phrase	Meaning	Example sentence
artificial intelligence	computer systems performing tasks that usually require human intelligence	Artificial intelligence can analyse complex data.
automation	use of technology to perform tasks automatically	Automation improves speed but may change jobs.
robotics	design and use of programmable machines	Robotics is used in factories and hospitals.
virtual reality	a computer-created environment that feels real	Virtual reality can support medical training.
3D printing	creation of objects by building material in layers	3D printing allows rapid production of prototypes.
smart device	an electronic device connected to networks and able to process data	A smart device can monitor energy use.

Ethics and impact

Word or phrase	Meaning	Example sentence
ethical concern	a worry about whether something is right or fair	Facial recognition raises ethical concerns.
data privacy	protection of personal digital information	Medical systems must protect data privacy.
unintended consequence	an unplanned result of an action or invention	New technology can have unintended consequences.
benefit society	improve life for people or communities	Scientific progress should benefit society.
responsible innovation	development that considers safety, fairness and wider effects	Responsible innovation requires public discussion.
access to technology	the ability to obtain and use technology	Unequal access to technology can widen inequality.



Phrasal verbs

Use these natural verb combinations when speaking or writing about this topic.

Word or phrase	Meaning	Example sentence
carry out	perform a study or task	Scientists carried out further tests.
find out	discover information	Researchers used the experiment to find out how the material reacted.
come up with	think of an idea or solution	Engineers came up with a simpler design.
work on	spend time developing something	The team is working on a new vaccine.
build on	use earlier knowledge as a base for progress	The research builds on previous studies.
rule out	show that something is not possible or responsible	Tests ruled out several causes.
set up	arrange equipment or a study	Technicians set up the experiment carefully.
break down	separate or analyse into smaller parts	The software breaks down complex data.
scale up	increase the size or production of something	The company plans to scale up production.
test out	try something to assess it	Volunteers tested out the prototype.
bring about	cause something to happen	Innovation can bring about social change.
move forward	make progress	Funding allowed the project to move forward.

High-value collocations

conduct scientific research	form a hypothesis	collect reliable data
analyse results	perform an experiment	take accurate measurements
follow safety procedures	develop a prototype	solve a practical problem
make a discovery	achieve a breakthrough	publish findings
launch a mission	carry out a clinical trial	develop new technology
raise ethical concerns	protect data privacy	improve lives



SCIENCE AND INNOVATION | LANGUAGE BUILDER

Idioms and figurative expressions

Use these selectively. One natural expression is more effective than several forced into the same answer.

Word or phrase	Meaning	Example sentence
not rocket science	not very difficult to understand	The basic experiment is not rocket science.
light years ahead	much more advanced	The new battery is light years ahead of the old design.
reinvent the wheel	waste effort creating something that already exists	Researchers should share data rather than reinvent the wheel.
push the boundaries	extend what is possible or accepted	Space missions continue to push the boundaries of engineering.
ahead of the curve	more advanced than others	The laboratory is ahead of the curve in robotics.
trial and error	learning by testing different possibilities	The prototype improved through trial and error.
a eureka moment	a sudden understanding or discovery	The solution came in a eureka moment.
the next big thing	an innovation expected to become important	Some believe quantum computing is the next big thing.

Exam-ready language

Purpose	Useful sentence frame
Introducing a benefit	<i>One significant benefit is that...</i>
Introducing a drawback	<i>A possible drawback is that...</i>
Balancing an argument	<i>Although this offers clear advantages, it may also...</i>
Explaining a result	<i>As a result, people may...</i>
Giving an example	<i>A clear example of this can be seen when...</i>
Making a comparison	<i>Compared with..., this option is...</i>
Giving advice	<i>People can improve the situation by...</i>
Suggesting action	<i>One practical solution would be to...</i>
Expressing caution	<i>It is important to consider whether...</i>
Giving an opinion	<i>In my view, the most sensible approach is to...</i>