

# Comparison of AC v8.4 to v9.0

## Year 10: Science

Key	same/refined	removed	new	moved
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**Note:**

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- v8.4 content descriptions may have been reordered to align with v9.0 content descriptions.

Version 8.4			Version 9.0		
Achievement standard			Achievement standard		
<p>By the end of Year 10, students analyse how the periodic table organises elements and use it to make predictions about the properties of elements. They explain how chemical reactions are used to produce particular products and how different factors influence the rate of reactions. They explain the concept of energy conservation and represent energy transfer and transformation within systems. They apply relationships between force, mass and acceleration to predict changes in the motion of objects. Students describe and analyse interactions and cycles within and between Earth's spheres. They evaluate the evidence for scientific theories that explain the origin of the universe and the diversity of life on Earth. They explain the processes that underpin heredity and evolution. Students analyse how the models and theories they use have developed over time and discuss the factors that prompted their review.</p> <p>Students develop questions and hypotheses and independently design and improve appropriate methods of investigation, including field work and laboratory experimentation. They explain how they have considered reliability, safety, fairness and ethical actions in their methods and identify where digital technologies can be used to enhance the quality of data. When analysing data, selecting evidence and developing and justifying conclusions, they identify alternative explanations for findings and explain any sources of uncertainty. Students evaluate the validity and reliability of claims made in secondary sources with reference to currently held scientific views, the quality of the methodology and the evidence cited. They construct evidence-based arguments and select appropriate representations and text types to communicate science ideas for specific purposes.</p>			<p>By the end of Year 10, students explain the processes that underpin heredity and genetic diversity and describe the evidence supporting the theory of evolution by natural selection. They sequence key events in the origin and evolution of the universe and describe the supporting evidence for the big bang theory. They describe trends in patterns of global climate change and identify causal factors. They explain how Newton's laws describe motion and apply them to predict motion of objects in a system. They explain patterns and trends in the periodic table and predict the products of reactions and the effect of changing reactant and reaction conditions. Students analyse the importance of publication and peer review in the development of scientific knowledge and analyse the relationship between science, technologies and engineering. They analyse the key factors that influence interactions between science and society.</p> <p>Students plan and conduct safe, valid and reproducible investigations to test relationships or develop explanatory models. They explain how they have addressed any ethical and intercultural considerations when generating or using primary and secondary data. They select equipment and use it efficiently to generate and record appropriate sample sizes and replicable data with precision. They select and construct effective representations to organise, process and summarise data and information. They analyse and connect a variety of data and information to identify and explain patterns, trends, relationships and anomalies. They evaluate the validity and reproducibility of methods, and the validity of conclusions and claims. They construct logical arguments based on analysis of a variety of evidence to support conclusions and evaluate claims. They select and use content, language and text features effectively to achieve their purpose when communicating their ideas, findings and arguments to diverse audiences.</p>		
Strands	Sub-strands	Content descriptions	Content descriptions	Sub-strands	Strands
Science understanding	Biological sciences	transmission of heritable characteristics from one generation to the next involves DNA and genes ACSSU184 the theory of evolution by natural selection explains the diversity of living things and is supported by a range of scientific evidence ACSSU185	explain the role of <b>meiosis and mitosis and the function of chromosomes</b> , DNA and genes in heredity and predict patterns of Mendelian inheritance AC9S10U01 use the theory of evolution by natural selection to explain past and present diversity and analyse the scientific evidence supporting the theory AC9S10U02	Biological sciences	Science understanding
	Earth and space sciences	the universe contains features including galaxies, stars and solar systems, and the Big Bang theory can be used to explain the origin of the universe ACSSU188 global systems, including the carbon cycle, rely on interactions involving the biosphere, lithosphere, hydrosphere and atmosphere ACSSU189 <b>Moved to Year 9</b>	describe how the big bang theory models the origin and evolution of the universe and <b>analyse the supporting evidence for the theory</b> AC9S10U03 <b>use models of energy flow between the geosphere, biosphere, hydrosphere and atmosphere to explain patterns of global climate change</b> AC9S10U04	Earth and space sciences	
	Physical sciences	energy conservation in a system can be explained by describing energy transfers and transformations ACSSU190 <b>Moved to Year 9</b> the motion of objects can be described and predicted using the laws of physics ACSSU229	investigate Newton's laws of motion and quantitatively analyse the relationship between force, mass and acceleration of objects AC9S10U05	Physical sciences	
	Chemical sciences	the atomic structure and properties of elements are used to organise them in the Periodic Table ACSSU186 different types of chemical reactions are used to produce a range of products and can occur at different rates ACSSU187	explain how the structure and properties of atoms relate to the organisation of the elements in the periodic table AC9S10U06 <b>identify patterns in synthesis, decomposition and displacement reactions</b> and investigate the factors that affect reaction rates AC9S10U07	Chemical sciences	
Science as a human endeavour	scientific understanding, including models and theories, is contestable and is refined over time through a process of review by the scientific community ACSHE191 advances in scientific understanding often rely on technological advances and are often linked to scientific discoveries ACSHE192		explain how scientific knowledge is validated and refined, including the role of publication and peer review AC9S10H01 investigate how advances in technologies enable advances in science, and how science has contributed to developments in technologies and engineering AC9S10H02	Science as a human endeavour	Science as a human endeavour
	people use scientific knowledge to evaluate whether they accept claims, explanations or predictions, and advances in science can affect people's lives, including <b>generating new career opportunities</b> ACSHE194 <b>Moved to Years 7–8</b> values and needs of contemporary society can influence the focus of scientific research ACSHE230		<b>analyse the key factors that contribute to science knowledge and practices being adopted more broadly by society</b> AC9S10H03 examine how the values and needs of society influence the focus of scientific research AC9S10H04		
Science inquiry skills	formulate questions or hypotheses that can be investigated scientifically ACSIS198		develop <b>investigable</b> questions, <b>reasoned predictions</b> and hypotheses to <b>test relationships and develop explanatory models</b> AC9S10I01	Science inquiry	Science inquiry
	plan, select and use appropriate investigation types, including field work and laboratory experimentation, to collect reliable data; assess risk and address ethical issues associated with these methods ACSIS199 select and use appropriate equipment, including digital technologies, to collect and record data <b>systematically and accurately</b> ACSIS200		plan and conduct <b>valid, reproducible</b> investigations to answer questions and <b>test hypotheses</b> , including identifying and controlling for possible sources of error and, as appropriate, developing and following risk assessments, considering ethical issues, and <b>addressing key considerations regarding heritage sites and artefacts on Country/Place</b> AC9S10I02		

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	select and use equipment to generate and record data with <u>precision</u> to obtain <u>useful sample sizes and replicable</u> data, using digital tools as appropriate AC9S10I03
analyse patterns and trends in data, including describing relationships between variables and identifying inconsistencies ACSIS203 use knowledge of scientific concepts to draw conclusions that are consistent with evidence ACSIS204	select and construct appropriate representations, including tables, graphs, <u>descriptive statistics, models and mathematical relationships</u> , to organise and process data and information AC9S10I04 analyse and connect a variety of data and information to identify and explain patterns, trends, relationships and anomalies AC9S10I05
evaluate conclusions, including identifying sources of uncertainty and possible alternative explanations, and describe specific ways to improve the quality of the data ACSIS205 critically analyse the validity of information in primary and secondary sources and evaluate the approaches used to solve problems ACSIS206	assess the validity and reproducibility of methods and evaluate the validity of conclusions and claims, including by <u>identifying assumptions, conflicting evidence</u> and areas of uncertainty AC9S10I06 construct arguments based on analysis of a variety of evidence to support conclusions or evaluate claims, and consider any <u>ethical issues and cultural protocols associated with accessing, using or citing secondary data or information</u> AC9S10I07
communicate scientific ideas and information for a particular purpose, including constructing evidence-based arguments and using appropriate scientific language, conventions and representations ACSIS208	write and create texts to communicate ideas, findings and arguments effectively for identified purposes <u>and audiences</u> , including selection of appropriate content, language and <u>text features, using digital tools as appropriate</u> AC9S10I08

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