

Australian Curriculum: BSHS Mathematics — Year 9

Year 9 Achievement Standard

By the end of Year 9, students solve problems involving simple interest. They interpret ratio and scale factors in similar figures. Students explain similarity of triangles. They recognise the connections between similarity and the trigonometric ratios. Students compare techniques for collecting data from primary and secondary sources. They make sense of the position of the mean and median in skewed, symmetric and bi-modal displays to describe and interpret data.

Students apply the index laws to numbers and express numbers in scientific notation. They expand binomial expressions. They find the distance between two points on the Cartesian plane and the gradient and midpoint of a line segment. They sketch linear and non-linear relations. Students calculate areas of shapes and the volume and surface area of right prisms and cylinders. They use Pythagoras' Theorem and trigonometry to find unknown sides of right-angled triangles. Students calculate relative frequencies to estimate probabilities, list outcomes for two-step experiments and assign probabilities for those outcomes. They construct histograms and back-to-back stem-and-leaf plots.

CURRICULUM	SEMESTER 1		SEMESTER 2	
	Unit 1	Unit 2	Unit 3	Unit 4
Unit name	Number	Algebra	Measurement and Geometry	Probability and Data
Unit description	Number	Algebra	Measurement and Geometry	Probability and Data

ASSESSMENT		Summative assessment task 1	Summative assessment task 2	Summative assessment task 3	Summative assessment task 4
Range and balance of summative assessment conventions	Technique	Examination	Examination	Examination	Problem Solving and Modelling Task
	Type of text	Written	Written	Written	Written
	Mode	Short response	Short response	Short response	Extended Response
	Conditions	Closed Book 2 X 70 minute lesson	Closed book 2 x 70 minute lesson	Closed book 2 x 70 minute lesson	Open book 4 x 70 minute lessons
Aspects of the achievement standard					
solve problems involving simple interest					
interpret ratio					
Interpret scale factors in similar figures					
explain similarity of triangles					
recognise the connections between similarity and the trigonometric ratios					
compare techniques for collecting data from primary and secondary sources					
make sense of the position of the mean and median in skewed, symmetric and bi-modal displays to describe and interpret data					
apply the index laws to numbers and express numbers in scientific notation					
expand binomial expressions					
find the distance between two points on the Cartesian plane and					
find the gradient and midpoint of a line segment					
sketch linear relations					
sketch non-linear relations					
calculate areas of shapes					
calculate the volume of right prisms and cylinders					
calculate the surface area of right prisms and cylinders					
use Pythagoras' Theorem and trigonometry to find unknown sides of right-angled triangles					
calculate relative frequencies to estimate probabilities, list outcomes for two-step experiments and assign probabilities for those outcomes					
construct histograms and back-to-back stem-and-leaf plots					

Shaded cells indicate opportunities that summative assessments provide for students to demonstrate evidence against all aspects of the achievement standard

PROFICIENCIES			
The Australian Curriculum: Mathematics proficiency strands are understanding, fluency, problem-solving and reasoning. They describe how content is explored or developed; that is, the thinking and doing of mathematics. The inclusion of the proficiencies in the curriculum is to ensure that student learning and student independence are at the centre of the curriculum. The curriculum focuses on developing increasingly sophisticated and refined mathematical proficiency skills. They enable students to respond to familiar and unfamiliar situations by employing mathematical strategies to make informed decisions and solve problems efficiently.			
Understanding Students build a robust knowledge of adaptable and transferable mathematical concepts. They make connections between related concepts and progressively apply the familiar to develop new ideas. They develop an understanding of the relationship between the 'why' and the 'how' of mathematics. Students build understanding when they connect related ideas, when they represent concepts in different ways, when they identify commonalities and differences between aspects of content, when they describe their thinking mathematically and when they interpret mathematical information.	Fluency Students develop skills in choosing appropriate procedures; carrying out procedures flexibly, accurately, efficiently and appropriately; and recalling factual knowledge and concepts readily. Students are fluent when they calculate answers efficiently, when they recognise robust ways of answering questions, when they choose appropriate methods and approximations, when they recall definitions and regularly use facts, and when they can manipulate expressions and equations to find solutions.	Problem-solving Students develop the ability to make choices, interpret, formulate, model and investigate problem situations, and communicate solutions effectively. Students formulate and solve problems when they use mathematics to represent unfamiliar or meaningful situations, when they design investigations and plan their approaches, when they apply their existing strategies to seek solutions, and when they verify that their answers are reasonable.	Reasoning Students develop an increasingly sophisticated capacity for logical thought and actions, such as analysing, proving, evaluating, explaining, inferring, justifying and generalising. Students are reasoning mathematically when they explain their thinking, when they deduce and justify strategies used and conclusions reached, when they adapt the known to the unknown, when they transfer learning from one context to another, when they prove that something is true or false, and when they compare and contrast related ideas and explain their choices.

