

(no-code)

recognise and extend the application of to tenths and hundredths and use the conventions of notation to name and represent

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Elaborations

- using a bar to represent the whole, dividing it into 10 10 1 0 equal pieces with each piece representing 0.1 0.1 0 . 1 or a tenth of the whole length and understanding that 2 2 2 pieces are 0.2 0.2 0 . 2 or two-tenths of the whole
- using materials to show the relationship between the whole, tenths and hundredths; for example, using a bundle of 10 10 1 0 straws to represent the whole, one straw as the tenth and cutting the tenth into 10 10 1 0 parts to show the hundredths; using “Decipipes” to represent tenths
- recognising that one is the same as ten-tenths and one-tenth is the same as 10 10 1 0 hundredths and using this relationship to ; for example, renaming 0.25 0.25 0 . 2 5 as two-tenths and five-hundredths or twenty-five hundredths
- making models of measurement to show the relationship between the base unit and parts of the unit; for example, 1.5 1.5 1 . 5 metres is one metre and five-tenths of the next metre; 1.75 1.75 1 . 7 5 is one unit and seventy-five hundredths of the next unit
- large quantities of mixed notes and coins, writing the total using dollars and cents, and recognising the cents as parts of the next dollar
- comparing the way money and are read and said, and explaining how they are the same and different; for example, \$ 2.75 \ \$2.75 \$ 2 . 7 5 is said, “two dollars seventy-five” and 2.75 2.75 2 . 7 5 metres is said “two seven five metres”; recognising that the 7 7 7 seven-tenths and the 5 5 5 five-hundredths in both

Students learn to:

**recognise and extend the application of place value to tenths and hundredths and u
of decimal notation to name and represent decimals**

(AC9M4N01)

General capabilities and cross-curriculum priorities

This content description connects to the following general capabilities and cross-curriculum priorities.

Number sense and algebra

- Number and place value

Elaborations

Content elaborations provide suggestions of ways to teach the content description and connect it to general capabilities and cross-curriculum priorities. Content elaborations are optional .

Number sense and algebra

- Interpreting fractions

Measurement and geometry

- Understanding units of measurement

Number sense and algebra

- Counting processes
- Understanding money

Measurement and geometry

- Understanding units of measurement

Number sense and algebra

- Number and place value
- Understanding money

Snapshot – Number and place value

Numeracy: Number sense and algebra: Number and place value

Content description

AC9M4N01

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this

content.

Numeral recognition and identification

- identifies, reads, writes and interprets numerals beyond 1000 1000 1 0 0 0 applying knowledge of place value, including numerals that contain a zero (e.g. reads 1345 1345 1 3 4 5 as one thousand, 3 3 3 hundred and 45 45 4 5 ; reads one thousand and 15 15 1 5 and writes as 1015 1015 1 0 1 5 ; compares the size of populations of schools, suburbs, cities and ecosystems or the cost of items in shopping catalogues)

Place value

- represents, flexibly partitions and renames four-digit numbers into standard and non-standard place value partitions (e.g. uses grid paper to show the size of each digit in 2202 2202 2 2 0 2 ; renames 5645 5645 5 6 4 5 as 3645 3645 3 6 4 5 and 2000 2000 2 0 0 0 in order to subtract 1998 1998 1 9 9 8)
- estimates and rounds natural numbers to the nearest 10 10 1 0 or nearest 100 100 1 0 0 (e.g. pencils come in a pack of 10 10 1 0 , so estimates the number of packs required for 127 127 1 2 7 Year 6 6 6 students; to check the reasonableness of their solution to the computation $212 + 195$ $212 + 195$ 2 1 2 + 1 9 5 , rounds both numbers to 200 200 2 0 0)
- represents and names tenths as one out of 10 10 1 0 equal parts of a whole (e.g. uses a bar model to represent the whole and its parts; uses a straw that has been cut into 10 10 1 0 equal pieces to demonstrate that one piece is one-tenth of a whole straw and 2 2 2 pieces are two-tenths of the whole straw)
- represents and names one-tenth as its decimal equivalent (e.g. 0.1 0.1 0 . 1 , zero point one)
- extends the place value system to tenths

Numeral recognition and identification

- identifies, reads and writes numerals, beyond 4 4 4 digits in length, with spacing after every 3 3 3 digits (e.g. 10 10 1 0 204 204 2 0 4 , 25 25 2 5 000 000 0 0 0 000 000 0 0 0 ; 12 12 1 2 230.25 230.25 2 3 0 . 2 5 ; reads 152 152 1 5 2 450 450 4 5 0 as "one hundred and 52 52 5 2 thousand 4 4 4 hundred and 50 50 5 0 "; compares the size of populations for different countries or the cost of expensive items with an advertised selling price in the millions)
- identifies, reads and writes decimals to one and 2 2 2 decimal places (e.g. reads 4.75 4.75 4 . 7 5 as "four point seven five" or 4 4 4 and 75 75 7 5 hundredths; writes 4 4 4 dollars and 5 5 5 cents as \$ 4.05 \$4.05 \$ 4 . 0 5)

Place value

- estimates and rounds natural numbers to the nearest 10 thousand, thousand etc. recognising the multiplicative relationships between the place value of the digits (e.g. estimates the crowd numbers at a football match; says that the \$ 9863 \$9863 \$ 9 8 6 3 raised at a charity event was close to \$ 10 \$10 \$ 1 0 000 000 0 0 0 ; recognises that 200 years is 10 times as large as 20 years, and applies this to environmental change)
- explains that the place value names for decimal numbers relate to the ones place value
- explains and demonstrates that the place value system extends beyond tenths to hundredths, thousandths ... (e.g. uses decimals to represent part units of measurement for length, mass, capacity and temperature)
- represents, compares, orders and interprets decimals up to 2 2 2 decimal places (e.g. constructs a number line to include decimal values between zero and one, when asked "which is greater 0.19 0.19 0 . 1 9 or 0.2 0.2 0 . 2 ?", responds " 0.2 0.2 0 . 2 " ; interprets and compares measurements such as the temperature on different days or the change in height of a growing plant observed and recorded during science investigations)
- rounds decimals to the nearest natural number in order to estimate answers (e.g. estimates the length of material needed by rounding up the measurement to the nearest natural number)

Numeral recognition and identification

- identifies, reads, writes and interprets decimal numbers applying knowledge of the place value periods of tenths, hundredths and thousandths and beyond

Place value

- compares the size of decimals to other numbers including natural numbers and decimals expressed to different numbers of places (e.g. selects 0.35 0.35 0 . 3 5 as the greatest number from the set 0.2 , 0.125 , 0.35 0.2, 0.125, 0.35 0 . 2 , 0 . 1 2 5 , 0 . 3 5 ; explains that 2 2 2 is greater than 1.845 1.845 1 . 8 4 5)

- describes the multiplicative relationship between the adjacent positions in place value for decimals (e.g. understands that 0.2 0.2 0 . 2 is 10 10 1 0 times as great as 0.02 0.02 0 . 0 2 and that 100 100 1 0 0 times 0.005 0.005 0 . 0 0 5 is 0.5 0.5 0 . 5)
- compares and orders decimals greater than one including those expressed to an unequal number of places (e.g. compares the heights of students in the class that are expressed in metres such as 1.6 1.6 1 . 6 m is taller than 1.52 1.52 1 . 5 2 m; correctly orders the numbers 1.4 1.4 1 . 4 , 1.375 1.375 1 . 3 7 5 and 2.15 2.15 2 . 1 5 from least to greatest)
- rounds decimals to one and 2 decimal places for a purpose

Snapshot – Interpreting fractions

Numeracy: Number sense and algebra: Interpreting fractions

Content description

AC9M4N01

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Equivalence of fractions

- identifies the need to have equal wholes to compare fractional parts (e.g. compares the pieces of pizza when 2 2 2 identical pizzas are cut into 6 6 6 and 8 8 8 and describes how one-sixth is greater than one-eighth)
- creates fractions greater than one by recreating the whole (e.g. when creating four-thirds, demonstrates that three-thirds corresponds to the whole and the fourth third is part of an additional whole)
- creates equivalent fractions by dividing the same-sized whole into different parts (e.g. shows two-sixths is the same as one-third of the same whole; creates a fraction wall)
- uses partitioning to establish relationships between fractions (e.g. creates one-sixth as one-third of one-half)

Fractions as numbers

- connects the concepts of fractions and division: a fraction is a quotient, or a division statement (e.g. two-sixths is the same as $2 \div 6$ $2 \div 6$ $2 \div 6$ or 2 2 2 partitioned into 6 6 6 equal parts or to solve "how to share 2 chocolate bars equally between 3 3 3 people", understands that it is 2 2 2 divided by 3 3 3 , therefore each person gets two-thirds of a chocolate bar)
- justifies where to place fractions on a number line (e.g. to show two-thirds on a number line divides the space between zero and one into 3 3 3 equal parts and indicates the correct location)
- uses and explains the equivalence of decimals to benchmark fractions (e.g. $1 \div 4 = 0.25$ $\frac{1}{4} = 0.25$ $4 \div 1 = 4$ $\frac{4}{1} = 4$, $1 \div 2 = 0.5$ $\frac{1}{2} = 0.5$ $2 \div 1 = 2$ $\frac{2}{1} = 2$, $3 \div 4 = 0.75$ $\frac{3}{4} = 0.75$ $4 \div 3 = 1.\overline{3}$ $\frac{4}{3} = 1.\overline{3}$, $1 \div 10 = 0.1$ $\frac{1}{10} = 0.1$ $10 \div 1 = 10$ $\frac{10}{1} = 10$, $1 \div 100 = 0.01$ $\frac{1}{100} = 0.01$ $100 \div 1 = 100$ $\frac{100}{1} = 100$; converts cup measures to millilitres)

Comparing fractions

- understands the equivalence relationship between a fraction, decimal and percentage as different representations of the same quantity (e.g. $1 \div 2 = 0.5 = 50\%$ $\frac{1}{2} = 0.5 = 50\%$ $2 \div 1 = 2$ $\frac{2}{1} = 2$ because 5 5 5 is half of 10 10 1 0 and 50 50 5 0 is half of 100 100 1 0 0)
- identifies a fraction as a rational number that has relative size (e.g. describes a position as $\frac{2}{3}$ $\frac{2}{3}$ $\frac{2}{3}$ of the way up a ladder or varies a movement by performing it at half speed; understands "a quarter turn" as turning 90° rather than turning once every four steps)
- reasons and uses knowledge of equivalence to compare and order fractions of the same whole (e.g. compares two-thirds and three-quarters of the same collection or whole, by converting them into equivalent fractions of eight-twelfths and nine-twelfths; explains that three-fifths must be greater than four-ninths because three-fifths is greater than a half, and four-ninths is less than a half)

Snapshot – Understanding units of measurement

Numeracy: Measurement and geometry: Understanding units of measurement

Content description

AC9M4N01

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Using metric units

- measures, compares and estimates length, perimeter and area of a surface using metric units (e.g. traces around their hand on centimetre grid paper and counts the number of squares to estimate the area of their hand print to be about 68 68 6 8 square centimetres)
- uses scaled instruments to measure length, mass, capacity and temperature, correctly interpreting any unlabelled calibrations (e.g. 3 3 3 marks between the numbered marks for kilograms means each gap represents 250 250 2 5 0 grams, so it's divided into quarter kilogram intervals)
- estimates measurements of an attribute using metric units (e.g. estimates the width of their thumb is close to a centimetre; compares the mass of 2 2 2 bags of fruit by hefting and says "this one feels like it weighs more than a kilogram"; approximates capacities based on the known capacity of a 600 600 6 0 0 -millilitre bottle of water)

Angles as measures of turn

- compares angles to a right angle and classifies them as equal to, less than or greater than a right angle (e.g. directly compares the size of angles to a right angle, by using the corner of a book; uses reference to a right angle to describe body positions during a choreographed dance or when practising a skill for a particular sport)

Using metric units

- calculates perimeter using properties of two-dimensional shapes to determine unknown lengths
- measures and calculates the area of different shapes using metric units and a range of strategies

Angles as measures of turn

- estimates and measures angles in degrees up to one revolution (e.g. uses a protractor to measure the size of an angle; estimates angles, such as those formed at the elbows when releasing an object; determines the effect of angles on the trajectory, height and distance of flight during jumps and throws in athletics)

Converting units

- converts between metric units of measurement of the same attribute (e.g. converts centimetres into millimetres by multiplying by 10 10 1 0 ; uses the consistent naming of metric prefixes to convert between adjacent units)
- describes and uses the relationship between metric units of measurement and the base- 10 10 1 0 place value system to accurately measure and record measurements using decimals

Using metric units and formulas

- establishes and uses formulas and metric units for calculating the area of rectangles and triangles

Angles as measures of turn

- measures and uses key angles (45 45 4 5 ■, 90 90 9 0 ■, 180 180 1 8 0 ■, 360 360 3 6 0 ■) to define other angles according to their size (e.g. measures a right angle to be 90■ and uses this to determine if 2 2 2 lengths are perpendicular)

Snapshot – Counting processes

Numeracy: Number sense and algebra: Counting processes

Content description

AC9M4N01

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Counting sequences

- continues counting from any number forwards and backwards beyond 100 100 1 0 0 using knowledge of place value
- counts in sequence by twos and fives starting at zero (e.g. counts items using number rhymes " 2 , 4 , 6 , 8 2 , 4 , 6 , 8 Mary's at the cottage gate ..."; skip counts in fives as " 5 , 10 , 15 , 20 5 , 10 , 15 , 20 5 , 1 0 , 1 5 , 2 0 ")
- counts in sequence forwards and backwards by tens on the decade up to 100 100 1 0 0

Perceptual counting

- counts items in groups of twos, fives and tens (e.g. counts a quantity of 10 10 1 0 -cent pieces as 10 , 20 , 30 10 , 20 , 30 1 0 , 2 0 , 3 0 ... to give the total value of the coins; counts the number of students by twos when lined up in pairs)

Counting sequences

- counts in sequence forwards and backwards by tens or fives off the decade to 100 100 1 0 0 and by hundreds up to 1000 1000 1 0 0 0 and beyond using knowledge of place value (e.g. 2 , 12 , 22 2, 12, 22 2 , 1 2 , 2 2 ... or 8 , 13 , 18 , 23 8, 13, 18, 23 8 , 1 3 , 1 8 , 2 3 ; 100 , 200 100, 200 1 0 0 , 2 0 0 ... 1000 1000 1 0 0 0)

Perceptual counting

- counts large quantities in groups or multiples (e.g. groups items into piles of 10 10 1 0 , then counts the piles, adding on the residual to quantify the whole collection)
- estimates the number of items to count to assist with determining group sizes (e.g. decides that counting in twos would not be the most efficient counting strategy based on a quick estimate of the quantity and decides instead to use groups of 10 10 1 0)

Counting sequences

- counts forwards and backwards from any number
- applies counting processes flexibly to count in rational numbers (e.g. counts in thirds such as $1\frac{3}{3}$ $1\frac{3}{3}$ $1\frac{3}{3}$ ■ , $2\frac{3}{3}$, $1\frac{1}{3}$, $1\frac{2}{3}$, $2\frac{2}{3}$, $1\frac{1}{3}$, $1\frac{2}{3}$, $2\frac{2}{3}$ ■ , $1\frac{1}{3}$, $1\frac{2}{3}$ ■ , $2\frac{2}{3}$...; starting from 4 4 4 counts backwards by 0.3 0.3 0 . 3 (e.g. 4 , 3.7 , 3.4 , 3.1 4, 3.7, 3.4, 3.1 4 , 3 . 7 , 3 . 4 , 3 . 1 ...)
- counts backwards from zero understanding that the count can be extended in the negative direction (e.g. 0 0 0 , - 1 1 1 , - 2 2 2 , - 3 3 3 , - 4 4 4)

Abstract counting

- applies counting processes to quantify any type of conceivable collection (e.g. systematically counts the number of possible outcomes of an event; applies a frequency count; estimates and compares the difference between a word or character count in a text)

Snapshot – Understanding money

Numeracy: Number sense and algebra: Understanding money

Content description

AC9M4N01

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Equivalent money

- understands that the Australian monetary system includes both coins and notes and how they are related (e.g. orders a collection of money based on its monetary value)
- determines the equivalent value of coins to \$ 5 \$ 5 \$ 5 using any combination of 5 5 5 c, 10 10 10 c, 20 20 20 c or 50 50 50 c coins
- represents different values of money in multiple ways

Counting money

- counts a larger collection of coins by making groups (e.g. counts the coins in a money box by sorting the 5 5 5 c, 10 10 10 c and 20 20 20 c pieces into \$ 1 \$ 1 \$ 1 groups)
- determines the amount of money in a collection, including both notes and coins, using basic counting principles and the standard form of writing dollars and cents in decimal format, to 2 2 2 decimal places

Working with money additively

- calculates the total cost of several different items in dollars and cents
- counts the change required for simple transactions to the nearest 5 5 5 cents
- calculates the change, to the nearest 5 5 5 cents, after a purchase using additive strategies (e.g. adds change to obtain the amount tendered)
- determines the conditions for a profit or a loss on a transaction

Snapshot – Understanding units of measurement

Numeracy: Measurement and geometry: Understanding units of measurement

Content description

AC9M4N01

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Snapshot – Number and place value

Numeracy: Number sense and algebra: Number and place value

Content description

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Place value

- represents, flexibly partitions and renames four-digit numbers into standard and non-standard place value partitions (e.g. uses grid paper to show the size of each digit in 2202 2202 2 2 0 2 ; renames 5645 5645 5 6 4 5 as 3645 3645 3 6 4 5 and 2000 2000 2 0 0 0 in order to subtract 1998 1998

1 9 9 8)

- estimates and rounds natural numbers to the nearest 10 10 1 0 or nearest 100 100 1 0 0 (e.g. pencils come in a pack of 10 10 1 0 , so estimates the number of packs required for 127 127 1 2 7 Year 6 6 6 students; to check the reasonableness of their solution to the computation $212 + 195$ $212 + 195$ 2 1 2 + 1 9 5 , rounds both numbers to 200 200 2 0 0)
- represents and names tenths as one out of 10 10 1 0 equal parts of a whole (e.g. uses a bar model to represent the whole and its parts; uses a straw that has been cut into 10 10 1 0 equal pieces to demonstrate that one piece is one-tenth of a whole straw and 2 2 2 pieces are two-tenths of the whole straw)
- represents and names one-tenth as its decimal equivalent (e.g. 0.1 0.1 0 . 1 , zero point one)
- extends the place value system to tenths

Numeral recognition and identification

- identifies, reads and writes numerals, beyond 4 4 4 digits in length, with spacing after every 3 3 3 digits (e.g. 10 10 1 0 204 204 2 0 4 , 25 25 2 5 000 000 0 0 0 000 000 0 0 0 ; 12 12 1 2 230.25 230.25 2 3 0 . 2 5 ; reads 152 152 1 5 2 450 450 4 5 0 as "one hundred and 52 52 5 2 thousand 4 4 4 hundred and 50 50 5 0 "; compares the size of populations for different countries or the cost of expensive items with an advertised selling price in the millions)
- identifies, reads and writes decimals to one and 2 2 2 decimal places (e.g. reads 4.75 4.75 4 . 7 5 as "four point seven five" or 4 4 4 and 75 75 7 5 hundredths; writes 4 4 4 dollars and 5 5 5 cents as \$ 4.05 \$4.05 \$ 4 . 0 5)

Place value

- estimates and rounds natural numbers to the nearest 10 thousand, thousand etc. recognising the multiplicative relationships between the place value of the digits (e.g. estimates the crowd numbers at a football match; says that the \$ 9863 \$9863 \$ 9 8 6 3 raised at a charity event was close to \$ 10 \$10 \$ 1 0 000 000 0 0 0 ; recognises that 200 years is 10 times as large as 20 years, and applies this to environmental change)
- explains that the place value names for decimal numbers relate to the ones place value
- explains and demonstrates that the place value system extends beyond tenths to hundredths, thousandths ... (e.g. uses decimals to represent part units of measurement for length, mass, capacity and temperature)
- represents, compares, orders and interprets decimals up to 2 2 2 decimal places (e.g. constructs a number line to include decimal values between zero and one, when asked "which is greater 0.19 0.19 0 . 1 9 or 0.2 0.2 0 . 2 ?", responds " 0.2 0.2 0 . 2 " ; interprets and compares measurements such as the temperature on different days or the change in height of a growing plant observed and recorded during science investigations)
- rounds decimals to the nearest natural number in order to estimate answers (e.g. estimates the length of material needed by rounding up the measurement to the nearest natural number)

Numeral recognition and identification

- identifies, reads, writes and interprets decimal numbers applying knowledge of the place value periods of tenths, hundredths and thousandths and beyond

Place value

- compares the size of decimals to other numbers including natural numbers and decimals expressed to different numbers of places (e.g. selects 0.35 0.35 0 . 3 5 as the greatest number from the set 0.2 , 0.125 , 0.35 0.2 , 0.125 , 0.35 0 . 2 , 0 . 1 2 5 , 0 . 3 5 ; explains that 2 2 2 is greater than 1.845 1.845 1 . 8 4 5)
- describes the multiplicative relationship between the adjacent positions in place value for decimals (e.g. understands that 0.2 0.2 0 . 2 is 10 10 1 0 times as great as 0.02 0.02 0 . 0 2 and that 100 100 1 0 0 times 0.005 0.005 0 . 0 0 5 is 0.5 0.5 0 . 5)
- compares and orders decimals greater than one including those expressed to an unequal number of places (e.g. compares the heights of students in the class that are expressed in metres such as 1.6 1.6 1 . 6 m is taller than 1.52 1.52 1 . 5 2 m; correctly orders the numbers 1.4 1.4 1 . 4 , 1.375 1.375 1 . 3 7 5 and 2.15 2.15 2 . 1 5 from least to greatest)
- rounds decimals to one and 2 decimal places for a purpose

Snapshot – Understanding money

Numeracy: Number sense and algebra: Understanding money

Content description

AC9M4N01

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Counting money

- determines the equivalent value of coins or notes sorted into one denomination
- counts small collections of coins or notes according to their value
- writes the value of a small collection of coins or notes in whole dollars, or whole cents using numbers and the correct dollar sign or cent symbol

Equivalent money

- understands that the Australian monetary system includes both coins and notes and how they are related (e.g. orders a collection of money based on its monetary value)
- determines the equivalent value of coins to \$ 5 using any combination of 5 5 5 c, 10 10 10 c, 20 20 20 c or 50 50 50 c coins
- represents different values of money in multiple ways

Counting money

- counts a larger collection of coins by making groups (e.g. counts the coins in a money box by sorting the 5 5 5 c, 10 10 10 c and 20 20 20 c pieces into \$ 1 groups)
- determines the amount of money in a collection, including both notes and coins, using basic counting principles and the standard form of writing dollars and cents in decimal format, to 2 decimal places

AC9M4A01

find unknown values in numerical involving addition and subtraction, using the properties of numbers and

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Elaborations

- demonstrating the properties of addition using materials, diagrams and ; for example, using to demonstrate that $5 + 2 = 2 + 5$ $5 + 2 = 2 + 5$ $5 + 2 = 2 + 5$, demonstrating that $2 + 2 + 3 = 7$ $2 + 2 + 3 = 7$ $2 + 2 + 3 = 7$ and $2 + 3 + 2 = 7$ $2 + 3 + 2 = 7$ $2 + 3 + 2 = 7$ and $3 + 2 + 2 = 7$ $3 + 2 + 2 = 7$ $3 + 2 + 2 = 7$
- using balance and informal uniform to create addition or subtraction showing equivalence, such as $7 + 8 = 6 + 9$ $7 + 8 = 6 + 9$ $7 + 8 = 6 + 9$, and to find unknowns in , such as $6 + 8 = \square + 10$ $6 + 8 = \square + 10$ $6 + 8 = \square + 10$
- using relational thinking and knowledge of to explain whether involving addition or subtraction are true; for example, explaining that $27 - 14 = 17 - 4$ $27 - 14 = 17 - 4$ $27 - 14 = 17 - 4$ is true and using a to show the common difference is 13 13 13
- using part-part-whole diagrams or bar models to recognise and explain the inverse relationship between addition and subtraction, using this to make calculations easier; for example, solving $27 + \square = 63$ $27 + \square = 63$ $27 + \square = 63$ using subtraction, $\square = 63 - 27$ $\square = 63 - 27$ $\square = 63 - 27$

Students learn to:

find unknown values in numerical equations involving addition and subtraction, using properties of numbers and operations

(AC9M4A01)

General capabilities and cross-curriculum priorities

This content description connects to the following general capabilities and cross-curriculum priorities.

Analysing

- Interpret concepts and problems

Inquiring

- Identify, process and evaluate information

Number sense and algebra

- Additive strategies

- Number patterns and algebraic thinking

Elaborations

Content elaborations provide suggestions of ways to teach the content description and connect it to general capabilities and cross-curriculum priorities. Content elaborations are optional .

Analysing

- Interpret concepts and problems

Analysing

- Interpret concepts and problems

Inquiring

- Identify, process and evaluate information

Analysing

- Interpret concepts and problems
- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Analysing

- Interpret concepts and problems

Inquiring

- Identify, process and evaluate information

Resources

Work Samples

WS02 - Number: addition and subtraction

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4A01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4A01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Additive strategies

Numeracy: Number sense and algebra: Additive strategies

Content description

AC9M4A01

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Flexible strategies with two-digit numbers

- chooses from a range of known strategies to solve additive problems involving two-digit numbers (e.g. uses place value knowledge, known addition facts and part-part-whole number knowledge to solve problems like $24 + 8 + 13$ $24 + 8 + 13$ $24 + 8 + 13$, partitions 888 as 666 and 222 more, then combines 2424 and 666 to rename it as 303030 before combining it with 131313 to make 434343 , and then combines the remaining 222 to find 454545 ; adds the same quantity to both numbers $47 - 38 = 49 - 40$ $47 - 38 = 49 - 40$ $47 - 38 = 49 - 40$)
- identifies that the same combinations and partitions to 101010 are repeated within each decade (e.g. knowing that $8 + 2 = 10$ $8 + 2 = 10$ $8 + 2 = 10$, knows $18 + 2 = 20$ $18 + 2 = 20$ $18 + 2 = 20$ and $28 + 2 = 30$ $28 + 2 = 30$ $28 + 2 = 30$ etc.)
- identifies addition as associative and commutative and that subtraction is neither
- applies the commutative and associative properties of addition to simplify mental computation (e.g. to calculate $23 + 9 + 7$ $23 + 9 + 7$ $23 + 9 + 7$ adds 232323 to 777 to get 303030 , then adds 999 to give 393939)
- applies inverse relationship of addition and subtraction to solve problems, including solving problems with digital tools, and uses the inverse relationship to justify an answer (e.g. when solving $23 - 16$ $23 - 16$ chooses to use addition $16 + ? = 23$ $16 + ? = 23$ $16 + ? = 23$; when using a calculator to solve $16 + ? = 38$ $16 + ? = 38$ $16 + ? = 38$ decides to use subtraction and inputs $38 - 16$ $38 - 16$ $38 - 16$)
- represents a wide range of additive problem situations involving two-digit numbers using appropriate addition and subtraction number sentences

Flexible strategies with three-digit numbers and beyond

- uses place value, standard and non-standard partitioning, trading or exchanging of units to mentally add and subtract numbers with 333 or more digits (e.g. to add 250250 and 457457 , partitions 250250 into 222 hundreds and 555 tens, says 457457 plus 222 hundreds is 657657 , plus 555 tens is 707707 ; to add 184184 and 270270 partitions into $150 + 34 + 250 + 20 = 400 + 34 + 20 = 454$ $150 + 34 + 250 + 20 = 400 + 34 + 20 = 454$ $150 + 34 + 250 + 20 = 400 + 34 + 20 = 454$)
- chooses and uses strategies including algorithms and technology to efficiently solve additive problems (e.g. develops total costings for ingredients or materials for a task or combines measurements to determine the total amount of materials required)
- uses estimation to determine the reasonableness of the solution to an additive problem (e.g. when asked to add 249249 and 437437 says " $250 + 440$ $250 + 440$ $250 + 440$ is 690690 ")
- represents a wide range of familiar real-world additive situations involving large numbers as standard number sentences explaining their reasoning

Flexible strategies with fractions and decimals

- uses knowledge of place value and how to partition numbers in different ways to make the calculation easier when adding and subtracting decimals with up to 333 decimal places
- identifies and justifies the need for a common denominator when solving additive problems involving fractions with related denominators
- represents a wide range of familiar real-world additive situations involving decimals and common fractions as standard number sentences, explaining their reasoning

Snapshot – Number patterns and algebraic thinking

Numeracy: Number sense and algebra: Number patterns and algebraic thinking

Content description

AC9M4A01

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Continuing and generalising patterns

- represents growing patterns where the difference between each successive term is constant, using physical and virtual materials, then summarising the pattern numerically (e.g. constructs a pattern using physical materials such as toothpicks, then summarises the number of toothpicks used as $4, 7$

, 10, 13 4, 7, 10, 13 4, 7, 10, 13 ...)

- describes rules for replicating or continuing growing patterns where the difference between each successive term is the same (e.g. to determine the next number in the pattern 3, 6, 9, 12, 3, 6, 9, 12, 3, 6, 9, 12 ... you add 3 3 3; for 20, 15, 10, 20, 15, 10, 20, 15, 10 ... the rule is described as each term is generated by subtracting 5 5 5 from the previous term)

Relational thinking

- uses the equals sign to represent "is equivalent to" or "is the same as" in number sentences (e.g. when asked to write an expression that is equivalent to $5 + 3$, responds $6 + 2$ and then writes $5 + 3 = 6 + 2$)
- solves number sentences involving unknowns using the inverse relationship between addition and subtraction (e.g. $3 + ? = 5$ and knowing $5 - 3 = 2$ then $?$ must be 2)

Generalising patterns

- represents growing patterns where each successive term is determined by multiplying the previous term by a constant, using concrete materials, then summarises the pattern numerically (e.g. constructs a pattern using concrete materials such as tiles then summarises the pattern as 2 , 6 , 18 , 54 2, 6, 18, 54 2 , 6 , 1 8 , 5 4 ...)
- describes rules for copying or continuing patterns where each successive term is found by multiplying or dividing the previous term by the same factor (e.g. to determine the next term in the pattern 1 , 3 , 9 , 27 1, 3, 9, 27 1 , 3 , 9 , 2 7 ... multiply by 3 3 3)

Relational thinking

- uses relational thinking to determine the missing values in a number sentence (e.g. $6 + 6 = \square$ $6 + ? = 7 + 4 = 7 + 4 = 7 + 4$)
- uses equivalent number sentences involving addition or subtraction to calculate efficiently or to find an unknown (e.g. $527 + 96 = 527 + 96 = \square$ $527 + 96 = ?$ is the same as $527 + 100 - 4 = 527 + 100 - 4 = \square$ $527 + 100 - 4 = ?$; If $6 + 6 = 8 + 3 = 8 + 3 = 8 + 3$, then as I know $8 = 6 + 2$ $8 = 6 + 2$ $8 = 6 + 2$, I can write $8 + 3$ $8 + 3$ $8 + 3$ as $6 + 2 + 3$ $6 + 2 + 3$ $6 + 2 + 3$, which is the same as $6 + 5$ $6 + 5$ $6 + 5$ therefore '?' is 5 5 5)
- solves numerical equations involving unknowns using the inverse relationship between multiplication and division (e.g. determines the missing number in $2 \times 2 = \square$ $2 \times ? = 10 = 10 = 10$ knowing $10 \div 2$ $10 \div 2$ $10 \div 2$ is equal to 5 5 5 then ? must be 5 5 5)

Generalising patterns

- creates and interprets tables used to summarise patterns (e.g. the cost of hiring a bike based on the cost per hour)
- identifies a single operation rule in numerical patterns and records it in words (e.g. European dress size = Australian dress size + 30 +30 + 3 0)
- relates the position number of shapes within a pattern to the rule for the sequence (e.g. number of counters = = shape number + 2 + 2 + 2)
- determines a higher term of a pattern using the pattern's rule
- extends number patterns to include rational numbers (e.g. 2 , 2 1 4 , 2 1 2 , 2 3 4 , 3 2 , 2 $\frac{1}{4}$, 2 $\frac{1}{2}$, 3 $\frac{1}{4}$, 3 2 , 2 4 1 ■ , 2 2 1 ■ , 2 4 3 ■ , 3 ...; 2 , 2 , 2 , - 4 , 8 , 4 , 8 , 4 , 8 , - 16 16 1 6 ...; 10 , 9.8 , 9.6 , 9.4 10 , 9.8 , 9.6 , 9.4 1 0 , 9 . 8 , 9 . 6 , 9 . 4 ...)

Relational thinking

- solves numerical equations involving one or more operations following conventions of order of operations (e.g. $5 \times 2 + 4 = 4 \times 2 + 5 \times 2 + 4 = 4 \times 2 + 5 \times 2 + 4 = 4 \times 2 + ?$; $6 + 6 + 6 + ? \times 4 = 9 \times 2 \times 4 = 9 \times 2 \times 4 = 9 \times 2$)
- identifies and uses equivalence in number sentences to solve multiplicative problems involving numerical equations (e.g. uses a number balance or other materials to represent the number sentence $6 \times 4 = 12 \times 6 \div 4 = 12 \div 6 \times 4 = 12 \div ?$ in order to solve a problem)

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4A01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4A01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4A01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4A01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4A01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4A01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4A01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4A01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Resource – WS02 - Number: addition and subtraction

By the end of Year 4, students use their understanding of place value to represent tenths and hundredths in decimal form and to multiply natural numbers by multiples of 10.■They use mathematical modelling to solve financial and other practical problems, formulating the problem using number sentences, solving the problem choosing efficient strategies and interpreting results in terms of the situation.■Students use their proficiency with addition and multiplication facts to add and subtract, multiply and divide numbers efficiently. They choose rounding and estimation strategies to determine whether results of calculations are reasonable.■Students use the properties of odd and even numbers.■They recognise equivalent fractions and make connections between fraction and decimal notations.■Students count and represent fractions on a number line. They find unknown values in numerical equations involving addition and subtraction.■Students follow and create algorithms that generate sets of numbers and identify emerging patterns.

They use scaled instruments and appropriate units to measure length, mass, capacity and temperature.■Students measure and approximate perimeters and areas.■They convert between units of

time when solving problems involving duration.■Students compare angles relative to a right angle using angle names.■They represent and approximate shapes and objects in the environment.■Students create and interpret grid references.■They identify line and rotational symmetry in plane shapes and create symmetrical patterns.

Students create many-to-one data displays, assess the suitability of displays for representing data and discuss the shape of distributions and variation in data.■They use surveys and digital tools to generate categorical or discrete numerical data in statistical investigations and communicate their findings in context.■Students order events or the outcomes of chance experiments in terms of likelihood and identify whether events are independent or dependent.■They conduct repeated chance experiments and describe the variation in results.

AC9M4N06

develop efficient strategies and use appropriate digital tools for solving problems involving addition and subtraction, and multiplication and division where there is no remainder

AC9M4N09

follow and create algorithms involving a sequence of steps and decisions that use addition or multiplication to generate sets of numbers; identify and describe any emerging patterns

AC9M4A01

find unknown values in numerical equations involving addition and subtraction, using the properties of numbers and operations

AC9M4A02

recall and demonstrate proficiency with up to 10×10 and related ; extend and apply facts to develop efficient mental strategies for with larger numbers without a calculator

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Elaborations

- using on grid paper or created with blocks or counters to develop, represent and explain patterns in the $10 \times 10 \times 10$ to $10 \times 10 \times 10$; using the to explain the related
- using materials or diagrams to develop and record multiplication strategies such as doubling, halving, commutativity, and adding one more or subtracting from a group to reach a known fact; for example, creating of 3 3 3 on grid paper and doubling to find of 6 6 6; recording and explaining the connections to the $3 \times 3 \times 3$ and $6 \times 6 \times 6$; $3 \times 3 \times 3 = 27$, $6 \times 6 \times 6 = 216$, ...
doubled is 6, 12, 18, 36, 54, 108, 216, ...
- using known for 2, 3, 5, 2, 3, 5, 2, 3, 5 and $10 \times 10 \times 10$ to establish for 4, 6, 7, 8, 4, 6, 7, 8, 4, 6, 7, 8 and 9, 9, 9 in different ways; for example, using of $10 \times 10 \times 10$ to establish the of 9, 9, 9 as “to multiply a number by 9, 9, 9 you multiply by $10 \times 10 \times 10$ then take the number away”; $9 \times 4 = 36$, $9 \times 4 = 36$, $9 \times 4 = 36$, so $9 \times 4 \times 9 \times 4 \times 9 \times 4$ is $40 - 4 = 36$, $40 - 4 = 36$, $40 - 4 = 36$; using multiple of 3, 3, 3 as “to multiply a number by 9, 9, 9 you multiply by 3, 3, 3, and then multiply the result by 3, 3, 3 again”
- using and known for twos and fives to develop the for sevens, applying the of multiplication; for example, when finding $6 \times 7 \times 6 \times 7 \times 6 \times 7$, knowing that 7, 7, 7 is made up of 2, 2, 2 and 5, 5, 5, and using an array to show that $6 \times 7 \times 6 \times 7 \times 6 \times 7$ is the same as $6 \times 2 + 6 \times 5 = 12 + 30$, $6 \times 2 + 6 \times 5 = 12 + 30$, $6 \times 2 + 6 \times 5 = 12 + 30$ which is 42, 42, 42
- using known up to $10 \times 10 \times 10$ to $10 \times 10 \times 10$ and the inverse relationship of multiplication and to establish corresponding
- designing, creating and playing instructive card games that involve the recall, recognition and explanation of the $10 \times 10 \times 10$ to $10 \times 10 \times 10$ and related

Students learn to:

recall and demonstrate proficiency with multiplication facts up to 10×10 and related facts; extend and apply facts to develop efficient mental strategies for computation

numbers without a calculator

(AC9M4A02)

General capabilities and cross-curriculum priorities

This content description connects to the following general capabilities and cross-curriculum priorities.

Analysing

- Interpret concepts and problems
- Draw conclusions and provide reasons

Number sense and algebra

- Multiplicative strategies

Elaborations

Content elaborations provide suggestions of ways to teach the content description and connect it to general capabilities and cross-curriculum priorities. Content elaborations are optional .

Analysing

- Interpret concepts and problems
- Draw conclusions and provide reasons

Analysing

- Interpret concepts and problems
- Draw conclusions and provide reasons

Analysing

- Interpret concepts and problems

Analysing

- Interpret concepts and problems

Analysing

- Interpret concepts and problems
- Draw conclusions and provide reasons

Analysing

- Interpret concepts and problems

Generating

- Create possibilities
- Consider alternatives

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4A02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4A02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Multiplicative strategies

Numeracy: Number sense and algebra: Multiplicative strategies

Content description

AC9M4A02

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Coordinating composite units

- identifies and represents multiplication in various ways and solves simple multiplicative problems using these representations (e.g. represents multiplication as equal groups and arrays)
- identifies and represents division in various ways such as sharing division or grouping division (e.g. to share a carton of 12 12 1 2 eggs equally between 4 4 4 people, draws 12 12 1 2 dots and circles 3 3 3 groups of 4 4 4 with 3 3 3 in each share)
- identifies and represents multiplication and division abstractly using the symbols \times \times and \div \div (e.g. represents 3 3 3 groups of 4 4 4 as 3×4 3×4 ; uses $9 \div 3$ $9 \div 3$ $9 \div 3$ to represent 9 9 9 pieces of fruit being equally shared by 3 3 3 people)

Flexible strategies for single digit multiplication and division

- draws on the structure of multiplication to use known multiples in calculating related multiples (e.g. uses multiples of 4 4 4 to calculate multiples of 8 8 8)
- interprets a range of multiplicative situations using the context of the problem to form a number sentence (e.g. to calculate the total number of buttons in 2 containers, each with 5 buttons, uses the number sentence $2 \times 5 = 2 \times 5 = 2 \times 5 = ?$; if a packet of 20 20 2 0 pens is to be shared equally between 4 4 4 , writes $20 \div 4 = 20 \div 4 = 20 \div 4 = ?$)
- demonstrates flexibility in the use of single-digit multiplication facts (e.g. 7 7 7 boxes of 6 6 donuts is 42 42 4 2 donuts altogether because $7 \times 6 = 42$ $7 \times 6 = 42$ $7 \times 6 = 42$; multiplying any factor by one will always give a product of that factor i.e. $1 \times 6 = 6$ $1 \times 6 = 6$ $1 \times 6 = 6$; if you multiply any number by zero the result will always be zero)
- uses the commutative and distributive properties of multiplication to aid computation when solving problems (e.g. 5×6 5×6 is the same as 6×5 6×5 ; calculates 7×4 7×4 by adding 5×4 5×4 and 2×4 2×4)
- applies mental strategies for multiplication to division and can justify their use (e.g. to divide 64 64 6 4 by 4 4 4 , halves 64 64 6 4 then halves 32 32 3 2 to get an answer of 16 16 1 6)
- explains the idea of a remainder as what is "left over" from the division (e.g. an incomplete group, lot of, next row or multiple)

Flexible strategies for multiplication and division

- uses multiplication and division as inverse operations to solve problems, including solving problems with digital tools and to justify a solution (e.g. when solving 14×14 14×14 14×14 chooses to use division $336 \div 14 = 336 \div 14 = 336 \div 14 = 24$; determines how long it will take to save up for a purchase and tests the effect of changing the amount saved each period)
- uses known mental and written strategies such as using the distributive property, partitioning into place value or factors to solve multiplicative problems involving numbers with up to 3 3 3 digits and can justify their use (e.g. $7 \times 83 = 7 \times 80 + 7 \times 3$ $7 \times 83 = 7 \times 80 + 7 \times 3$ $7 \times 83 = 7 \times 80 + 7 \times 3$; to multiply a number by 48 48 4 8 , first multiplies by 12 12 1 2 and then multiplies the result by 4 4 4 ; to solve 16×15 16×15 , uses double and half, such as $16 \times 15 = 8 \times 30$ 8×30 8×30)
- uses estimation and rounding to check the reasonableness of products and quotients (e.g. multiplies 200 200 2 0 0 by 30 30 3 0 to determine if 6138 6138 6 1 3 8 is a reasonable answer to 198×31 198×31)

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4A02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other

- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4A02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4A02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4A02

Continuum extract

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- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4A02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4A02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

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- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4A02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4A02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4A02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Create possibilities

Critical and Creative Thinking: Generating: Create possibilities

Content description

AC9M4A02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- create possibilities by connecting or creatively expanding on ideas in ways that are new to them
- create possibilities by connecting or creatively expanding on new and known ideas in a variety of ways
- create possibilities by changing, combining, or elaborating on new and known ideas in a variety of creative ways

Snapshot – Consider alternatives

Critical and Creative Thinking: Generating: Consider alternatives

Content description

AC9M4A02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- consider alternatives and explore different or creative ways to approach a task or problem

- consider alternatives by comparing different or creative ways to approach a task, issue or problem and recommend a preferred option
- consider alternatives by challenging or creatively adjusting existing ideas in situations where current approaches do not work and recommend a preferred option

AC9M4M01

interpret unmarked and partial when measuring and comparing of length, , , and temperature, using scaled and digital instruments and appropriate

-
-

Elaborations

- reading the of measured with digital and analog kitchen and explaining what unit of the on the analog refer to
- deciding on which attribute, unit and measuring instrument to use to compare the length and of various things, such as the distance travelled by an in a science investigation; explaining the use of such as grams or millimetres to give accurate when needed
- using scaled instruments such as tape , measuring jugs, kitchen and thermometers, recording using whole ; for example, 560 560 5 6 0 millimetres, or whole and part ; for example, 5.25 5.25 5 . 2 5 metres, 1.75 1.75 1 . 7 5 litres, 2.5 2.5 2 . 5 kilograms, 28.5 28.5 2 8 . 5 ° Celsius
- reading and interpreting the of an without marked minutes to estimate the time to the nearest minute and to determine the of time between
- using the timer or alarm of a clock to alert when a specified has elapsed from a given starting time; for example, the different activities of an exercise routine
- making a scaled measuring instrument such as a tape , ruler, sand timer, sun dial or measuring cup using scaled instruments and
- exploring the different types of scaled instruments used by First Nations Ranger Groups and other groups to make decisions about caring for , and these in local

Students learn to:

interpret unmarked and partial units when measuring and comparing attributes of le capacity, duration and temperature, using scaled and digital instruments and appro

(AC9M4M01)

General capabilities and cross-curriculum priorities

This content description connects to the following general capabilities and cross-curriculum priorities.

Analysing

- Interpret concepts and problems
- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Measurement and geometry

- Understanding units of measurement

Elaborations

Content elaborations provide suggestions of ways to teach the content description and connect it to general capabilities and cross-curriculum priorities. Content elaborations are optional .

Analysing

- Interpret concepts and problems
- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Analysing

- Interpret concepts and problems
- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Analysing

- Interpret concepts and problems
- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Number sense and algebra

- Number and place value

Analysing

- Interpret concepts and problems
- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Measurement and geometry

- Measuring time

Managing and operating

- Select and operate tools

Measurement and geometry

- Measuring time

Analysing

- Interpret concepts and problems
- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Analysing

- Interpret concepts and problems
- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Country/Place

• The First Peoples of Australia are the Traditional Owners of Country/Place, protected in Australian Law by the Native Title Act 1993 which recognises pre-existing sovereignty, continuing systems of law and customs, and connection to Country/Place. This recognised legal right provides for economic sustainability and a voice into the development and management of Country/Place.

Related content

This content description can be taught with the following content descriptions from other learning areas.

AC9S4I03

AC9TDE4P02

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4M01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4M01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4M01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Understanding units of measurement

Numeracy: Measurement and geometry: Understanding units of measurement

Content description

AC9M4M01

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Introducing metric units

- recognises standard metric units are used to measure attributes of shapes, objects and events (e.g. identifies units used to measure everyday items; recognises that distances in athletic events are measured in metres such as 100 and 200 metre races)
- uses the array structure to calculate area measured in square units (e.g. draws and describes the column and row structure to represent area as an array of square units, moving beyond counting of squares by ones)
- estimates the measurement of an attribute by visualising between known informal units (e.g. uses a cup to measure a half cup of rice; determines that about 3 3 3 sheets of paper would fit across a desk, and close to 6 6 6 might fit along it, so the area of the desk is about 18 18 1 8 sheets of paper)
- explains the difference between different attributes of the same shape or object and their associated metric units (e.g. length, mass and capacity)

Angles as measures of turn

- describes the size of an angle as a measure of turn and compares familiar measures of turn to known angles (e.g. the angle between the blades gets bigger as you open the scissors; a quarter turn creates a right angle)

Using metric units

- measures, compares and estimates length, perimeter and area of a surface using metric units (e.g. traces around their hand on centimetre grid paper and counts the number of squares to estimate the area of their hand print to be about 68 68 6 8 square centimetres)
- uses scaled instruments to measure length, mass, capacity and temperature, correctly interpreting any unlabelled calibrations (e.g. 3 3 3 marks between the numbered marks for kilograms means each gap represents 250 250 2 5 0 grams, so it's divided into quarter kilogram intervals)
- estimates measurements of an attribute using metric units (e.g. estimates the width of their thumb is close to a centimetre; compares the mass of 2 2 2 bags of fruit by hefting and says "this one feels like it weighs more than a kilogram"; approximates capacities based on the known capacity of a 600 600 6 0 0 -millilitre bottle of water)

Angles as measures of turn

- compares angles to a right angle and classifies them as equal to, less than or greater than a right angle (e.g. directly compares the size of angles to a right angle, by using the corner of a book; uses reference to a right angle to describe body positions during a choreographed dance or when practising a skill for a particular sport)

Using metric units

- calculates perimeter using properties of two-dimensional shapes to determine unknown lengths
- measures and calculates the area of different shapes using metric units and a range of strategies

Angles as measures of turn

- estimates and measures angles in degrees up to one revolution (e.g. uses a protractor to measure the size of an angle; estimates angles, such as those formed at the elbows when releasing an object; determines the effect of angles on the trajectory, height and distance of flight during jumps and throws in athletics)

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4M01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4M01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4M01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
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Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4M01

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Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

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Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

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Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

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Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

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Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

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- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Number and place value

Numeracy: Number sense and algebra: Number and place value

Content description

AC9M4M01

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Numerical recognition and identification

- identifies, reads and writes numerals, beyond 4 4 4 digits in length, with spacing after every 3 3 digits (e.g. 10 10 1 0 204 204 2 0 4 , 25 25 2 5 000 000 0 0 0 000 000 0 0 0 ; 12 12 1 2 230.25 230.25 2 3 0 . 2 5 ; reads 152 152 1 5 2 450 450 4 5 0 as "one hundred and 52 52 5 2 thousand 4 4 4 hundred and 50 50 5 0 "; compares the size of populations for different countries or the cost of expensive items with an advertised selling price in the millions)
- identifies, reads and writes decimals to one and 2 2 2 decimal places (e.g. reads 4.75 4.75 4 . 7 5 as "four point seven five" or 4 4 4 and 75 75 7 5 hundredths; writes 4 4 4 dollars and 5 5 5 cents as \$ 4.05 \$4.05 \$ 4 . 0 5)

Place value

- estimates and rounds natural numbers to the nearest 10 thousand, thousand etc. recognising the multiplicative relationships between the place value of the digits (e.g. estimates the crowd numbers at a football match; says that the \$ 9863 \$9863 \$ 9 8 6 3 raised at a charity event was close to \$ 10 \$10 \$ 1 0 000 000 0 0 0 ; recognises that 200 years is 10 times as large as 20 years, and applies this to environmental change)
- explains that the place value names for decimal numbers relate to the ones place value
- explains and demonstrates that the place value system extends beyond tenths to hundredths, thousandths ... (e.g. uses decimals to represent part units of measurement for length, mass, capacity and temperature)
- represents, compares, orders and interprets decimals up to 2 2 2 decimal places (e.g. constructs a number line to include decimal values between zero and one, when asked "which is greater 0.19 0.19 0 . 1 9 or 0.2 0.2 0 . 2 ?", responds " 0.2 0.2 0 . 2 " ; interprets and compares measurements such as the temperature on different days or the change in height of a growing plant observed and recorded during science investigations)
- rounds decimals to the nearest natural number in order to estimate answers (e.g. estimates the length of material needed by rounding up the measurement to the nearest natural number)

Numerical recognition and identification

- identifies, reads, writes and interprets decimal numbers applying knowledge of the place value periods of tenths, hundredths and thousandths and beyond

Place value

- compares the size of decimals to other numbers including natural numbers and decimals expressed to different numbers of places (e.g. selects 0.35 0.35 0 . 3 5 as the greatest number from the set 0.2 , 0.125 , 0.35 0.2, 0.125, 0.35 0 . 2 , 0 . 1 2 5 , 0 . 3 5 ; explains that 2 2 2 is greater than

1.845 1.845 1 . 8 4 5)

- describes the multiplicative relationship between the adjacent positions in place value for decimals (e.g. understands that 0.2 0.2 0 . 2 is 10 10 1 0 times as great as 0.02 0.02 0 . 0 2 and that 100 100 1 0 0 times 0.005 0.005 0 . 0 0 5 is 0.5 0.5 0 . 5)
- compares and orders decimals greater than one including those expressed to an unequal number of places (e.g. compares the heights of students in the class that are expressed in metres such as 1.6 1 . 6 m is taller than 1.52 1.52 1 . 5 2 m; correctly orders the numbers 1.4 1.4 1 . 4 , 1.375 1.375 1 . 3 7 5 and 2.15 2.15 2 . 1 5 from least to greatest)
- rounds decimals to one and 2 decimal places for a purpose

Numeral recognition and identification

- reads, represents, interprets and uses negative numbers in computation (e.g. explains that the temperature – 10 10 1 0 °C is colder than the temperature – 2.5 2.5 2 . 5 °C; recognises that negative numbers are less than zero; locates – 12 12 1 2 on a number line)

Place value

- identifies that negative numbers are integers that represent both size and direction (e.g. uses a number line to represent position and order negative numbers; uses negative numbers in financial contexts such as to model an overdrawn account)
- understands that multiplying and dividing numbers by 10 , 100 , 1000 10, 100, 1000 1 0 , 1 0 0 , 1 0 0 0 changes the positional value of the digits (e.g. explains that 100 100 1 0 0 times 0.125 0.125 0 . 1 2 5 is 12.5 12.5 1 2 . 5 because each digit value in 0.125 0.125 0 . 1 2 5 is multiplied by 100 100 1 0 0 , so 100×0.1 100 \times 0.1 1 0 0 \times 0 . 1 is 10 10 1 0 , 100×0.02 100 \times 0.02 1 0 0 \times 0 . 0 2 is 2 2 2 and 100×0.005 100 \times 0.005 1 0 0 \times 0 . 0 0 5 is 0.5 0.5 0 . 5 ; converts between units of centimetres and millimetres when planning, measuring and marking materials for cutting)
- rounds decimals to a specified number of decimal places for a purpose (e.g. the mean distance thrown in a school javelin competition was rounded to 2 2 2 decimal places; if the percentage profit was calculated as 12.467921 12.467921 1 2 . 4 6 7 9 2 1 % , rounds the calculation to 12.5 12.5 1 2 . 5 %)

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4M01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4M01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4M01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Measuring time

Numeracy: Measurement and geometry: Measuring time

Content description

AC9M4M01

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Measuring time

- uses standard instruments and units to describe and measure time to hours, minutes and seconds (e.g. measures time using a stopwatch; sets a timer on an appliance; estimates the time it would take to walk to the other side of the school oval and uses minutes as the unit of measurement)
- reads and interprets different representations of time (e.g. reads the time on an analog clock, watch or digital clock; uses lap times on a stop watch or fitness app)
- identifies the minute hand movement on an analog clock and the 60 60 6 0 -minute markings, interpreting the numbers as representing lots of 5 5 5 (e.g. interprets the time on an analog clock to read 7 7 7 : 40 40 4 0 , by reading the hour hand and the minute hand and explaining how they are related)
- uses smaller units of time such as seconds to record duration of events (e.g. records reaction times in sports or in relation to safe driving)
- uses a calendar to calculate time intervals in days and weeks, bridging months (e.g. develops fitness plans, tracks growth and development progress and sets realistic personal and health goals using a calendar)

Relating units of time

- identifies the relationship between units of time (e.g. months and years; seconds, minutes and hours)
- uses am and pm notation to distinguish between morning and afternoon using 12 12 1 2 -hour time
- determines elapsed time using different units such as hours and minutes, weeks and days (e.g. when developing project plans, time schedules and tracking growth)
- interprets and uses a timetable
- constructs timelines using a time scale (e.g. chronologically sequences the history of the school)

Converting between units of time

- interprets and converts between 12 12 1 2 -hour and 24 24 2 4 -hour digital time, and analog and digital representations of time to solve duration problems
- converts between units of time, using appropriate conversion rates, to solve problems involving time (e.g. uses that there are 60 60 6 0 seconds in a minute to calculate the percentage improvement a 1500 1500 1 5 0 0 m runner made to their personal best time)
- uses rates involving time to solve problems (e.g. "travelling at 60 60 6 0 km/h, how far will I travel in 30 30 3 0 minutes?"; adjusts cooking or baking times based on weight or the size of the container)

Snapshot – Select and operate tools

Digital Literacy: Managing and operating: Select and operate tools

Content description

AC9M4M01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- use familiar digital tools to complete tasks and consolidate learning
- attempt to solve a problem before seeking help
- select and use a range of digital tools to complete tasks
- attempt to solve a problem individually and with peers before seeking help
- select and use the core features of digital tools to efficiently complete tasks
- troubleshoot basic problems and identify repetitive tasks to automate

Snapshot – Measuring time

Numeracy: Measurement and geometry: Measuring time

Content description

AC9M4M01

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Measuring time

- uses standard instruments and units to describe and measure time to hours, minutes and seconds (e.g. measures time using a stopwatch; sets a timer on an appliance; estimates the time it would take to walk to the other side of the school oval and uses minutes as the unit of measurement)
- reads and interprets different representations of time (e.g. reads the time on an analog clock, watch or digital clock; uses lap times on a stop watch or fitness app)
- identifies the minute hand movement on an analog clock and the 60 60 6 0 -minute markings, interpreting the numbers as representing lots of 5 5 5 (e.g. interprets the time on an analog clock to read 7 7 7 : 40 40 4 0 , by reading the hour hand and the minute hand and explaining how they are related)
- uses smaller units of time such as seconds to record duration of events (e.g. records reaction times in sports or in relation to safe driving)
- uses a calendar to calculate time intervals in days and weeks, bridging months (e.g. develops fitness plans, tracks growth and development progress and sets realistic personal and health goals using a calendar)

Relating units of time

- identifies the relationship between units of time (e.g. months and years; seconds, minutes and hours)
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Converting between units of time

- interprets and converts between 12 12 1 2 -hour and 24 24 2 4 -hour digital time, and analog and digital representations of time to solve duration problems
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- uses rates involving time to solve problems (e.g. "travelling at 60 60 6 0 km/h, how far will I travel in 30 30 3 0 minutes?"; adjusts cooking or baking times based on weight or the size of the container)

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4M01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4M01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4M01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
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- condense and combine selected information related to the topic of study
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Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4M01

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Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

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Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

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AC9M4M02

recognise ways of measuring and approximating the and of and , using appropriate formal and

-
-

Elaborations

- recognising that is the sum of the lengths that form the boundary of a or enclosed space; choosing suitable from a of to around the boundary of a such as a garden bed; comparing the results to say which unit was an appropriate choice for the ; using a piece of string or rope to the of and , including those that have curved sections
- creating a of representing “paddocks” on grid paper and establishing different methods of working out the length of the boundary fences; explaining that the more efficient methods involve adding the side lengths rather than squares
- recognising that is the space enclosed by the boundary of a or the surface of an ; measuring and comparing the of , using an array of paper tiles or mosaic squares, including part to fill gaps at the edge of the ; comparing the total by combining the fractional parts to make whole
- demonstrating how to use one unit repeatedly to the of a ; for example, using one paper square to and compare the of a and a triangle; recording and explaining how they used part to give a more accurate , and why they needed to ensure there were no gaps or overlaps
- investigating the ways First Nations Ranger Groups and other groups of land to make decisions about fire burns to care for

Students learn to:

recognise ways of measuring and approximating the perimeter and area of shapes and using appropriate formal and informal units

(AC9M4M02)

General capabilities and cross-curriculum priorities

This content description connects to the following general capabilities and cross-curriculum priorities.

Analysing

- Interpret concepts and problems

Measurement and geometry

- Understanding units of measurement

Elaborations

Content elaborations provide suggestions of ways to teach the content description and connect it to general capabilities and cross-curriculum priorities. Content elaborations are optional .

Analysing

- Interpret concepts and problems

Analysing

- Interpret concepts and problems

Analysing

- Interpret concepts and problems

Measurement and geometry

- Understanding units of measurement

Number sense and algebra

- Interpreting fractions

Analysing

- Interpret concepts and problems
- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Country/Place

- First Nations communities of Australia maintain a deep connection to, and responsibility for, Country/Place and have holistic values and belief systems that are connected to the land, sea, sky and waterways.

People

- First Nations Australians have sophisticated political, economic and social organisation systems, which include family and kinship structures, laws, traditions, customs, land tenure systems, and protocols for strong governance and authority.

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4M02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
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Snapshot – Understanding units of measurement

Numeracy: Measurement and geometry: Understanding units of measurement

Content description

AC9M4M02

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Introducing metric units

- recognises standard metric units are used to measure attributes of shapes, objects and events (e.g. identifies units used to measure everyday items; recognises that distances in athletic events are measured in metres such as 100 and 200 metre races)
- uses the array structure to calculate area measured in square units (e.g. draws and describes the column and row structure to represent area as an array of square units, moving beyond counting of squares by ones)
- estimates the measurement of an attribute by visualising between known informal units (e.g. uses a cup to measure a half cup of rice; determines that about 3 3 3 sheets of paper would fit across a desk, and close to 6 6 6 might fit along it, so the area of the desk is about 18 18 1 8 sheets of paper)
- explains the difference between different attributes of the same shape or object and their associated metric units (e.g. length, mass and capacity)

Angles as measures of turn

- describes the size of an angle as a measure of turn and compares familiar measures of turn to known angles (e.g. the angle between the blades gets bigger as you open the scissors; a quarter turn creates a right angle)

Using metric units

- measures, compares and estimates length, perimeter and area of a surface using metric units (e.g. traces around their hand on centimetre grid paper and counts the number of squares to estimate the area of their hand print to be about 68 68 6 8 square centimetres)
- uses scaled instruments to measure length, mass, capacity and temperature, correctly interpreting any unlabelled calibrations (e.g. 3 3 3 marks between the numbered marks for kilograms means each gap represents 250 250 2 5 0 grams, so it's divided into quarter kilogram intervals)

- estimates measurements of an attribute using metric units (e.g. estimates the width of their thumb is close to a centimetre; compares the mass of 2 2 2 bags of fruit by hefting and says "this one feels like it weighs more than a kilogram"; approximates capacities based on the known capacity of a 600 600 6 0 0 -millilitre bottle of water)

Angles as measures of turn

- compares angles to a right angle and classifies them as equal to, less than or greater than a right angle (e.g. directly compares the size of angles to a right angle, by using the corner of a book; uses reference to a right angle to describe body positions during a choreographed dance or when practising a skill for a particular sport)

Using metric units

- calculates perimeter using properties of two-dimensional shapes to determine unknown lengths
- measures and calculates the area of different shapes using metric units and a range of strategies

Angles as measures of turn

- estimates and measures angles in degrees up to one revolution (e.g. uses a protractor to measure the size of an angle; estimates angles, such as those formed at the elbows when releasing an object; determines the effect of angles on the trajectory, height and distance of flight during jumps and throws in athletics)

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4M02

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Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4M02

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Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4M02

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Snapshot – Understanding units of measurement

Numeracy: Measurement and geometry: Understanding units of measurement

Content description

AC9M4M02

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this

content.

Repeating a single informal unit to measure

- measures length using a single informal unit repeatedly (e.g. uses one paper clip to measure the length of a line, making the first unit, marking its place, then moving the paper clip along the line and repeating this process)
- measures the area of a surface using an informal single unit of measure repeatedly (e.g. uses a sheet of paper to measure the area of a desktop)
- measures an attribute by counting the number of informal units used

Estimating measurements

- uses familiar household items as benchmarks when estimating, length, mass and capacity (e.g. compares capacities based on knowing the capacity of a bottle of water such as, "it will take about 3 3 3 bottles to fill")

Describing turns

- describes a turn in both direction and the amount of turn (e.g. a quarter turn to the right, a full turn on the spot)

Introducing metric units

- recognises standard metric units are used to measure attributes of shapes, objects and events (e.g. identifies units used to measure everyday items; recognises that distances in athletic events are measured in metres such as 100 and 200 metre races)
- uses the array structure to calculate area measured in square units (e.g. draws and describes the column and row structure to represent area as an array of square units, moving beyond counting of squares by ones)
- estimates the measurement of an attribute by visualising between known informal units (e.g. uses a cup to measure a half cup of rice; determines that about 3 3 3 sheets of paper would fit across a desk, and close to 6 6 6 might fit along it, so the area of the desk is about 18 18 1 8 sheets of paper)
- explains the difference between different attributes of the same shape or object and their associated metric units (e.g. length, mass and capacity)

Angles as measures of turn

- describes the size of an angle as a measure of turn and compares familiar measures of turn to known angles (e.g. the angle between the blades gets bigger as you open the scissors; a quarter turn creates a right angle)

Using metric units

- measures, compares and estimates length, perimeter and area of a surface using metric units (e.g. traces around their hand on centimetre grid paper and counts the number of squares to estimate the area of their hand print to be about 68 68 6 8 square centimetres)
- uses scaled instruments to measure length, mass, capacity and temperature, correctly interpreting any unlabelled calibrations (e.g. 3 3 3 marks between the numbered marks for kilograms means each gap represents 250 250 2 5 0 grams, so it's divided into quarter kilogram intervals)
- estimates measurements of an attribute using metric units (e.g. estimates the width of their thumb is close to a centimetre; compares the mass of 2 2 2 bags of fruit by hefting and says "this one feels like it weighs more than a kilogram"; approximates capacities based on the known capacity of a 600 600 6 0 0 -millilitre bottle of water)

Angles as measures of turn

- compares angles to a right angle and classifies them as equal to, less than or greater than a right angle (e.g. directly compares the size of angles to a right angle, by using the corner of a book; uses reference to a right angle to describe body positions during a choreographed dance or when practising a skill for a particular sport)

Snapshot – Interpreting fractions

Numeracy: Number sense and algebra: Interpreting fractions

Content description

AC9M4M02

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Equivalence of fractions

- identifies the need to have equal wholes to compare fractional parts (e.g. compares the pieces of pizza when 2 2 2 identical pizzas are cut into 6 6 6 and 8 8 8 and describes how one-sixth is greater than one-eighth)
- creates fractions greater than one by recreating the whole (e.g. when creating four-thirds, demonstrates that three-thirds corresponds to the whole and the fourth third is part of an additional whole)
- creates equivalent fractions by dividing the same-sized whole into different parts (e.g. shows two-sixths is the same as one-third of the same whole; creates a fraction wall)
- uses partitioning to establish relationships between fractions (e.g. creates one-sixth as one-third of one-half)

Fractions as numbers

- connects the concepts of fractions and division: a fraction is a quotient, or a division statement (e.g. two-sixths is the same as $2 \div 6$ $2 \div 6$ $2 \div 6$ or 2 2 2 partitioned into 6 6 6 equal parts or to solve "how to share 2 chocolate bars equally between 3 3 3 people", understands that it is 2 2 2 divided by 3 3 3, therefore each person gets two-thirds of a chocolate bar)
- justifies where to place fractions on a number line (e.g. to show two-thirds on a number line divides the space between zero and one into 3 3 3 equal parts and indicates the correct location)
- uses and explains the equivalence of decimals to benchmark fractions (e.g. $1 \div 4 = 0.25$ $\frac{1}{4} = 0.25$ $4 \div 1 = 4$ $1 \div 2 = 0.5$ $\frac{1}{2} = 0.5$ $2 \div 1 = 2$ $1 \div 3 = 0.\overline{3}$ $3 \div 4 = 0.75$ $\frac{3}{4} = 0.75$ $4 \div 3 = 1.\overline{3}$ $1 \div 10 = 0.1$ $\frac{1}{10} = 0.1$ $10 \div 1 = 10$ $1 \div 100 = 0.01$ $\frac{1}{100} = 0.01$ $100 \div 1 = 100$ $1 \div 0.1 = 10$); converts cup measures to millilitres)

Comparing fractions

- understands the equivalence relationship between a fraction, decimal and percentage as different representations of the same quantity (e.g. $1 \div 2 = 0.5 = 50\%$ $\frac{1}{2} = 0.5 = 50\%$ $2 \div 1 = 2$ $1 \div 5 = 0.2$ $5 \div 5 = 1$ $5 \div 10 = 0.5$ $10 \div 10 = 1$ $50 \div 50 = 1$ $50 \div 100 = 0.5$ $100 \div 100 = 1$ $0 \div 0 = 0$)
- identifies a fraction as a rational number that has relative size (e.g. describes a position as $\frac{2}{3}$ $\frac{2}{3}$ $\frac{2}{3}$ of the way up a ladder or varies a movement by performing it at half speed; understands "a quarter turn" as turning 90° rather than turning once every four steps)
- reasons and uses knowledge of equivalence to compare and order fractions of the same whole (e.g. compares two-thirds and three-quarters of the same collection or whole, by converting them into equivalent fractions of eight-twelfths and nine-twelfths; explains that three-fifths must be greater than four-ninths because three-fifths is greater than a half, and four-ninths is less than a half)

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4M02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4M02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4M02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

AC9M4M03

solve problems involving the of time including situations involving “am” and “pm” and conversions between of time

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-

Elaborations

- calculating the amount of time between 2 2 2 , such as the start and finish of a movie, a bus journey or a flight, including cases where the starting and finishing times are written using “am” and “pm” notation
- converting of time using relationships between , such as 60 60 6 0 minutes in an hour and 60 60 6 0 seconds in a minute, to solve problems; for example, creating a daily timetable for an activity such as an athletics carnival or planning an exercise routine with activities and rests
- exploring First Nations Australians’ explanations of the passing of time through cultural accounts about cyclic phenomena involving sun, moon and stars

Students learn to:

solve problems involving the duration of time including situations involving “am” and conversions between units of time

(AC9M4M03)

General capabilities and cross-curriculum priorities

This content description connects to the following general capabilities and cross-curriculum priorities.

Inquiring

- Identify, process and evaluate information

Measurement and geometry

- Measuring time

Elaborations

Content elaborations provide suggestions of ways to teach the content description and connect it to general capabilities and cross-curriculum priorities. Content elaborations are optional .

Inquiring

- Identify, process and evaluate information

Inquiring

- Identify, process and evaluate information

Inquiring

- Identify, process and evaluate information

Culture

- First Nations Australian societies are diverse and have distinct cultural expressions such as language, customs and beliefs. As First Nations Peoples of Australia, they have the right to maintain, control, protect and develop their cultural expressions, while also maintaining the right to control, protect and develop culture as Indigenous Cultural and Intellectual Property.

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4M03

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Measuring time

Numeracy: Measurement and geometry: Measuring time

Content description

AC9M4M03

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Measuring time

- uses standard instruments and units to describe and measure time to hours, minutes and seconds (e.g. measures time using a stopwatch; sets a timer on an appliance; estimates the time it would take to walk to the other side of the school oval and uses minutes as the unit of measurement)
- reads and interprets different representations of time (e.g. reads the time on an analog clock, watch or digital clock; uses lap times on a stop watch or fitness app)
- identifies the minute hand movement on an analog clock and the 60 60 6 0 -minute markings, interpreting the numbers as representing lots of 5 5 5 (e.g. interprets the time on an analog clock to read 7 7 7 : 40 40 4 0 , by reading the hour hand and the minute hand and explaining how they are related)
- uses smaller units of time such as seconds to record duration of events (e.g. records reaction times in sports or in relation to safe driving)
- uses a calendar to calculate time intervals in days and weeks, bridging months (e.g. develops fitness plans, tracks growth and development progress and sets realistic personal and health goals using a calendar)

Relating units of time

- identifies the relationship between units of time (e.g. months and years; seconds, minutes and hours)
- uses am and pm notation to distinguish between morning and afternoon using 12 12 1 2 -hour time
- determines elapsed time using different units such as hours and minutes, weeks and days (e.g. when developing project plans, time schedules and tracking growth)
- interprets and uses a timetable
- constructs timelines using a time scale (e.g. chronologically sequences the history of the school)

Converting between units of time

- interprets and converts between 12 12 1 2 -hour and 24 24 2 4 -hour digital time, and analog and digital representations of time to solve duration problems
- converts between units of time, using appropriate conversion rates, to solve problems involving time (e.g. uses that there are 60 60 6 0 seconds in a minute to calculate the percentage improvement a 1500 1500 1 5 0 0 m runner made to their personal best time)
- uses rates involving time to solve problems (e.g. "travelling at 60 60 6 0 km/h, how far will I travel in 30 30 3 0 minutes?"; adjusts cooking or baking times based on weight or the size of the container)

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4M03

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4M03

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4M03

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

AC9M4M04

estimate and compare using names including , , , and , and recognise their relationship to a

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Elaborations

- classifying the interior of a of , using examples of to identify , , right and
- identifying within the environment and estimating whether they are , right or
- creating a right-angle template using cardboard or a double-folded piece of paper and using it to compare in the environment, commenting on whether they are smaller than or greater than a
- using different measuring tools such as a spirit level or squares to determine whether or are straight, square or (at)

Students learn to:

estimate and compare angles using angle names including acute, obtuse, straight and revolution, and recognise their relationship to a right angle

(AC9M4M04)

General capabilities and cross-curriculum priorities

This content description connects to the following general capabilities and cross-curriculum priorities.

Analysing

- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Measurement and geometry

- Understanding geometric properties

Elaborations

Content elaborations provide suggestions of ways to teach the content description and connect it to general capabilities and cross-curriculum priorities. Content elaborations are optional .

Analysing

- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Analysing

- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Analysing

- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Analysing

- Draw conclusions and provide reasons

Generating

- Put ideas into action

Inquiring

- Identify, process and evaluate information

Related content

This content description can be taught with the following content descriptions from other learning areas.

AC9TDE4P02

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4M04

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4M04

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Understanding geometric properties

Numeracy: Measurement and geometry: Understanding geometric properties

Content description

AC9M4M04

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Properties of shapes and objects

- identifies the relationship between the number of sides of a two-dimensional shape and the number of vertices (e.g. if the shape has 4 4 4 sides, it has 4 4 4 vertices)
- describes and identifies the two-dimensional shapes that form the faces of three-dimensional objects (e.g. recognises the faces of a triangular prism as triangles and rectangles)
- represents shapes and objects (e.g. drawing and sketching; model building such as skeletal models and centi-cubes; using digital drawing packages; manipulates body to create shapes and objects when choreographing dance)

Transformations

- determines whether a shape has line symmetry (e.g. folds paper cut-outs of basic shapes to demonstrate which has line symmetry and which does not)
- identifies symmetry in the environment
- identifies and creates geometrical patterns involving the repetition of familiar shapes (e.g. uses pattern blocks to create a pattern and describes how the pattern was created)

Angles

- compares angles to a right angle, classifying them as greater than, less than or equal to a right angle

Properties of shapes and object

- identifies, names and classifies two-dimensional shapes according to their side and angle properties (e.g. describes a square as a regular rectangle)
- identifies key features of shapes (e.g. explains that quadrilaterals have 2 2 2 diagonals however they are not always equal in length)
- aligns three-dimensional objects to their two-dimensional nets
- identifies the relationship between the number of faces, edges and the number of vertices of a three-dimensional object (e.g. uses a table to list the number of faces, edges and vertices of common three-dimensional objects and identifies the relationships in the data)

Transformations

- identifies that shapes can have rotational symmetry (e.g. "this drawing of a flower is symmetrical as I can spin it around both ways and it always looks exactly the same")
- creates symmetrical designs using a range of shapes and identifies the type of symmetry as appropriate (e.g. uses symmetry as a stimulus for choreographing a dance; analyses the symmetrical qualities, shapes and lines in examples of Islamic art)
- creates tessellating patterns with common shapes, deciding which will tessellate and which will not by referring to their sides and angles

Angles

- estimates, compares and constructs angles (e.g. uses a ruler and protractor to construct a 45° angle; compares the size of angles in the environment and estimates their size)

- describes angles in the environment according to their size as acute, obtuse, right, straight, reflex or a revolution and identifies them in shapes and objects (e.g. identifies slope as angles in the environment such as the ramp outside of the school block)

Properties of shapes and objects

- classifies three-dimensional objects according to their properties (e.g. describes the difference between a triangular prism and a triangular pyramid)
- creates two-dimensional nets for pyramids and prisms

Transformations

- uses combinations of reflecting, translating and rotating shapes to describe and create patterns and solve problems
- identifies tessellations used in the environment and explains why some combinations of shapes will tessellate while others will not (e.g. tiling a wall using a combination of different shaped tiles; exploring regular and semi-regular tessellations in architectural design)
- explains the result of changing critical and non-critical properties of shapes (e.g. "if I enlarge a square, it's still a square, or if I rotate a square, it remains a square, but if I change the length of one of its sides, it's no longer a square")

Angles

- identifies supplementary and complementary angles and uses them to solve problems
- identifies that angles at a point add to 360° and that vertically opposite angles are equal and reasons to solve problems

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4M04

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4M04

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4M04

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to

provide reasons and construct arguments for choices made

- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4M04

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
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- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4M04

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4M04

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4M04

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made

- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Put ideas into action

Critical and Creative Thinking: Generating: Put ideas into action

Content description

AC9M4M04

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- put ideas into action by experimenting with options and predicting possible results
- put ideas into action by predicting an outcome, trialling options and assessing their effectiveness
- put ideas into action by predicting potential or future outcomes and systematically testing a range of options

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4M04

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

AC9M4SP01

represent and in the environment, using combinations of familiar and

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-

Elaborations

- identifying common that form part of a by re-creating these using physical or
- physically or virtually using cubes to make models that real ; for example, building a virtual environment by using a computer software program to out of cubes
- approximating in the environment with familiar and ; for example, drawing cartoon animals by combining familiar
- recognising how familiar and are used in logos and other graphics to represent more complex and creating logos using graphic design software

Students learn to:

represent and approximate composite shapes and objects in the environment, using familiar shapes and objects

(AC9M4SP01)

General capabilities and cross-curriculum priorities

This content description connects to the following general capabilities and cross-curriculum priorities.

Analysing

- Interpret concepts and problems

Generating

- Consider alternatives

Measurement and geometry

- Understanding geometric properties

Elaborations

Content elaborations provide suggestions of ways to teach the content description and connect it to general capabilities and cross-curriculum priorities. Content elaborations are optional .

Analysing

- Interpret concepts and problems

Analysing

- Interpret concepts and problems

Creating and exchanging

- Create, communicate and collaborate

Managing and operating

- Select and operate tools

Analysing

- Interpret concepts and problems

Analysing

- Interpret concepts and problems

Creating and exchanging

- Create, communicate and collaborate

Managing and operating

- Select and operate tools

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4SP01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Consider alternatives

Critical and Creative Thinking: Generating: Consider alternatives

Content description

AC9M4SP01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- consider alternatives and explore different or creative ways to approach a task or problem
- consider alternatives by comparing different or creative ways to approach a task, issue or problem and recommend a preferred option
- consider alternatives by challenging or creatively adjusting existing ideas in situations where current approaches do not work and recommend a preferred option

Snapshot – Understanding geometric properties

Numeracy: Measurement and geometry: Understanding geometric properties

Content description

AC9M4SP01

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Features of shapes and objects

- identifies and describes features of shapes and objects (e.g. sides, corners, faces, edges and vertices)
- sorts and classifies familiar shapes and objects based on obvious features (e.g. triangles have 3 sides; a sphere is round like a ball)

Transformations

- identifies features of shapes and objects of different sizes and in different orientations in the environment (e.g. identifies a rotated view of an object made out of centicubes; compares representation of familiar shapes and objects in visual artworks from different cultures, times and places commenting on their features)
- explains that the shape or object does not change when presented in different orientations (e.g. a square remains a square when rotated)

Angles

- identifies angles in the environment (e.g. an angle formed when a door is opened; identifies that there are 4 4 4 angles in a square)

Properties of shapes and objects

- identifies the relationship between the number of sides of a two-dimensional shape and the number of vertices (e.g. if the shape has 4 4 4 sides, it has 4 4 4 vertices)
- describes and identifies the two-dimensional shapes that form the faces of three-dimensional objects (e.g. recognises the faces of a triangular prism as triangles and rectangles)
- represents shapes and objects (e.g. drawing and sketching; model building such as skeletal models and centi-cubes; using digital drawing packages; manipulates body to create shapes and objects when choreographing dance)

Transformations

- determines whether a shape has line symmetry (e.g. folds paper cut-outs of basic shapes to demonstrate which has line symmetry and which does not)
- identifies symmetry in the environment
- identifies and creates geometrical patterns involving the repetition of familiar shapes (e.g. uses pattern blocks to create a pattern and describes how the pattern was created)

Angles

- compares angles to a right angle, classifying them as greater than, less than or equal to a right angle

Properties of shapes and object

- identifies, names and classifies two-dimensional shapes according to their side and angle properties (e.g. describes a square as a regular rectangle)
- identifies key features of shapes (e.g. explains that quadrilaterals have 2 2 2 diagonals however they are not always equal in length)
- aligns three-dimensional objects to their two-dimensional nets
- identifies the relationship between the number of faces, edges and the number of vertices of a three-dimensional object (e.g. uses a table to list the number of faces, edges and vertices of common three-dimensional objects and identifies the relationships in the data)

Transformations

- identifies that shapes can have rotational symmetry (e.g. "this drawing of a flower is symmetrical as I can spin it around both ways and it always looks exactly the same")
- creates symmetrical designs using a range of shapes and identifies the type of symmetry as appropriate (e.g. uses symmetry as a stimulus for choreographing a dance; analyses the symmetrical qualities, shapes and lines in examples of Islamic art)
- creates tessellating patterns with common shapes, deciding which will tessellate and which will not by referring to their sides and angles

Angles

- estimates, compares and constructs angles (e.g. uses a ruler and protractor to construct a 45° angle; compares the size of angles in the environment and estimates their size)
- describes angles in the environment according to their size as acute, obtuse, right, straight, reflex or a revolution and identifies them in shapes and objects (e.g. identifies slope as angles in the environment such as the ramp outside of the school block)

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4SP01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4SP01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Create, communicate and collaborate

Digital Literacy: Creating and exchanging: Create, communicate and collaborate

Content description

AC9M4SP01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- experiment with the features of familiar digital tools to create content
- use the core features of a range of digital tools to create content and communicate and collaborate with peers and trusted adults
- select and control a variety of features in appropriate digital tools to create content and communicate and collaborate with trusted groups

Snapshot – Select and operate tools

Digital Literacy: Managing and operating: Select and operate tools

Content description

AC9M4SP01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- use familiar digital tools to complete tasks and consolidate learning
- attempt to solve a problem before seeking help
- select and use a range of digital tools to complete tasks
- attempt to solve a problem individually and with peers before seeking help
- select and use the core features of digital tools to efficiently complete tasks
- troubleshoot basic problems and identify repetitive tasks to automate

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4SP01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4SP01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Create, communicate and collaborate

Digital Literacy: Creating and exchanging: Create, communicate and collaborate

Content description

AC9M4SP01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- experiment with the features of familiar digital tools to create content
- use the core features of a range of digital tools to create content and communicate and collaborate with peers and trusted adults
- select and control a variety of features in appropriate digital tools to create content and communicate and collaborate with trusted groups

Snapshot – Select and operate tools

Digital Literacy: Managing and operating: Select and operate tools

Content description

AC9M4SP01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- use familiar digital tools to complete tasks and consolidate learning
- attempt to solve a problem before seeking help
- select and use a range of digital tools to complete tasks
- attempt to solve a problem individually and with peers before seeking help
- select and use the core features of digital tools to efficiently complete tasks
- troubleshoot basic problems and identify repetitive tasks to automate

AC9M4SP02

create and interpret systems using and directions to locate and describe positions and pathways

-
-

Elaborations

- interpreting a map of a familiar location of interest, such as a map of the showgrounds, a food festival, a botanical garden, a park in the local or a train station, and writing instructions using for a friend to find them at a specified location
- recognising that a spreadsheet uses a system, locating and entering in cells and using a spreadsheet to record collected through observations or experiments
- comparing and contrasting, describing and locating landmarks, people or things in a bird's eye picture of a busy scene, such as people in a park, initially without a transparent system overlaid on the picture, and then with the grid overlaid; noticing how the grid helps to pinpoint things quickly and easily
- using different sized grids as a tool to enlarge an image or artwork
- simulating the actions of autonomous or robotic vehicles moving to different positions within a grid, using and to describe positions and pathways; for example, imitating an autonomous mobile warehouse robot moving stock to different aisles, using systems to locate positions

Students learn to:

create and interpret grid reference systems using grid references and directions to describe positions and pathways

(AC9M4SP02)

General capabilities and cross-curriculum priorities

This content description connects to the following general capabilities and cross-curriculum priorities.

Analysing

- Interpret concepts and problems

Generating

- Consider alternatives

Measurement and geometry

- Positioning and locating

Elaborations

Content elaborations provide suggestions of ways to teach the content description and connect it to general capabilities and cross-curriculum priorities. Content elaborations are optional .

Analysing

- Interpret concepts and problems

Generating

- Consider alternatives

Analysing

- Interpret concepts and problems

Generating

- Consider alternatives

Investigating

- Interpret data

Managing and operating

- Select and operate tools

Analysing

- Interpret concepts and problems

Generating

- Consider alternatives

Measurement and geometry

- Positioning and locating

Measurement and geometry

- Understanding geometric properties

Generating

- Put ideas into action

Measurement and geometry

- Positioning and locating

Related content

This content description can be taught with the following content descriptions from other learning areas.

AC9HS4S02

AC9HS4S03

AC9TDI4P04

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4SP02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Consider alternatives

Critical and Creative Thinking: Generating: Consider alternatives

Content description

AC9M4SP02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- consider alternatives and explore different or creative ways to approach a task or problem
- consider alternatives by comparing different or creative ways to approach a task, issue or problem and recommend a preferred option
- consider alternatives by challenging or creatively adjusting existing ideas in situations where current approaches do not work and recommend a preferred option

Snapshot – Positioning and locating

Numeracy: Measurement and geometry: Positioning and locating

Content description

AC9M4SP02

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Using informal maps and plans

- draws an informal map or sketch to provide directions (e.g. draws a dance map when planning choreography; sketches the pathway to provide directions for a robotic vehicle to move from one location to another within a space)
- describes and locates relative positions on an informal map or plan (e.g. locates the starting position for the cross-country race using an informal map of the course; uses a seating plan to describe where they sit relative to the teacher's desk)
- orients an informal map using recognisable landmarks and current location (e.g. orients a map to show the location of the audience and locates the entry and exit points of the school gymnasium)
- locates self on an informal map to select an appropriate path to a given location

Using formal maps and plans

- locates position on maps using grid references (e.g. locates the school in cell E5; uses grid references to identify specific locations on a stage and when creating a stage plan, lighting design or prompt script)
- describes routes using landmarks and directional language including reference to quarter, half, three-quarter turns; turns to the left and right; clockwise and anticlockwise turns (e.g. communicates strategic plays in relation to coaching a team game or sport)
- interprets keys, simple scales and compass directions contained within a map to locate features (e.g. uses a map and compass directions when bush walking or orienteering)

Using proportional thinking for scaling

- interprets the scale used to create plans, drawings or maps (e.g. interprets scale to determine the approximate distance between two locations when orienteering)
- interprets and uses plans and maps involving scale (e.g. creates and interprets scale drawings when designing and making set pieces for a production)
- describes and interprets maps to determine the geographical location and positioning of states and territories within Australia and of countries relative to Australia
- interprets and uses more formal directional language such as compass bearings, degrees of turn, coordinates and distances to locate position or the distance from one location to another (e.g. identifies coordinates using GPS technologies)

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4SP02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Consider alternatives

Critical and Creative Thinking: Generating: Consider alternatives

Content description

AC9M4SP02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- consider alternatives and explore different or creative ways to approach a task or problem
- consider alternatives by comparing different or creative ways to approach a task, issue or problem and recommend a preferred option
- consider alternatives by challenging or creatively adjusting existing ideas in situations where current approaches do not work and recommend a preferred option

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4SP02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Consider alternatives

Critical and Creative Thinking: Generating: Consider alternatives

Content description

AC9M4SP02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- consider alternatives and explore different or creative ways to approach a task or problem
- consider alternatives by comparing different or creative ways to approach a task, issue or problem and recommend a preferred option
- consider alternatives by challenging or creatively adjusting existing ideas in situations where current approaches do not work and recommend a preferred option

Snapshot – Interpret data

Digital Literacy: Investigating: Interpret data

Content description

AC9M4SP02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- classify and group data using digital familiar tools to answer simple questions
- organise, summarise and visualise data using a range of digital tools to identify patterns and answer questions
- analyse and visualise data using a range of digital tools to identify patterns and make predictions

Snapshot – Select and operate tools

Digital Literacy: Managing and operating: Select and operate tools

Content description

AC9M4SP02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- use familiar digital tools to complete tasks and consolidate learning
- attempt to solve a problem before seeking help
- select and use a range of digital tools to complete tasks
- attempt to solve a problem individually and with peers before seeking help

- select and use the core features of digital tools to efficiently complete tasks
- troubleshoot basic problems and identify repetitive tasks to automate

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4SP02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Consider alternatives

Critical and Creative Thinking: Generating: Consider alternatives

Content description

AC9M4SP02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- consider alternatives and explore different or creative ways to approach a task or problem
- consider alternatives by comparing different or creative ways to approach a task, issue or problem and recommend a preferred option
- consider alternatives by challenging or creatively adjusting existing ideas in situations where current approaches do not work and recommend a preferred option

Snapshot – Positioning and locating

Numeracy: Measurement and geometry: Positioning and locating

Content description

AC9M4SP02

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Using informal maps and plans

- draws an informal map or sketch to provide directions (e.g. draws a dance map when planning choreography; sketches the pathway to provide directions for a robotic vehicle to move from one location to another within a space)
- describes and locates relative positions on an informal map or plan (e.g. locates the starting position for the cross-country race using an informal map of the course; uses a seating plan to describe where they sit relative to the teacher's desk)
- orients an informal map using recognisable landmarks and current location (e.g. orients a map to show the location of the audience and locates the entry and exit points of the school gymnasium)
- locates self on an informal map to select an appropriate path to a given location

Using formal maps and plans

- locates position on maps using grid references (e.g. locates the school in cell E5; uses grid references to identify specific locations on a stage and when creating a stage plan, lighting design or prompt script)
- describes routes using landmarks and directional language including reference to quarter, half, three-quarter turns; turns to the left and right; clockwise and anticlockwise turns (e.g. communicates strategic plays in relation to coaching a team game or sport)
- interprets keys, simple scales and compass directions contained within a map to locate features (e.g. uses a map and compass directions when bush walking or orienteering)

Using proportional thinking for scaling

- interprets the scale used to create plans, drawings or maps (e.g. interprets scale to determine the approximate distance between two locations when orienteering)
- interprets and uses plans and maps involving scale (e.g. creates and interprets scale drawings when designing and making set pieces for a production)

- describes and interprets maps to determine the geographical location and positioning of states and territories within Australia and of countries relative to Australia
- interprets and uses more formal directional language such as compass bearings, degrees of turn, coordinates and distances to locate position or the distance from one location to another (e.g. identifies coordinates using GPS technologies)

Snapshot – Understanding geometric properties

Numeracy: Measurement and geometry: Understanding geometric properties

Content description

AC9M4SP02

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Properties of shapes and objects

- identifies the relationship between the number of sides of a two-dimensional shape and the number of vertices (e.g. if the shape has 4 4 4 sides, it has 4 4 4 vertices)
- describes and identifies the two-dimensional shapes that form the faces of three-dimensional objects (e.g. recognises the faces of a triangular prism as triangles and rectangles)
- represents shapes and objects (e.g. drawing and sketching; model building such as skeletal models and centi-cubes; using digital drawing packages; manipulates body to create shapes and objects when choreographing dance)

Transformations

- determines whether a shape has line symmetry (e.g. folds paper cut-outs of basic shapes to demonstrate which has line symmetry and which does not)
- identifies symmetry in the environment
- identifies and creates geometrical patterns involving the repetition of familiar shapes (e.g. uses pattern blocks to create a pattern and describes how the pattern was created)

Angles

- compares angles to a right angle, classifying them as greater than, less than or equal to a right angle

Properties of shapes and object

- identifies, names and classifies two-dimensional shapes according to their side and angle properties (e.g. describes a square as a regular rectangle)
- identifies key features of shapes (e.g. explains that quadrilaterals have 2 2 2 diagonals however they are not always equal in length)
- aligns three-dimensional objects to their two-dimensional nets
- identifies the relationship between the number of faces, edges and the number of vertices of a three-dimensional object (e.g. uses a table to list the number of faces, edges and vertices of common three-dimensional objects and identifies the relationships in the data)

Transformations

- identifies that shapes can have rotational symmetry (e.g. "this drawing of a flower is symmetrical as I can spin it around both ways and it always looks exactly the same")
- creates symmetrical designs using a range of shapes and identifies the type of symmetry as appropriate (e.g. uses symmetry as a stimulus for choreographing a dance; analyses the symmetrical qualities, shapes and lines in examples of Islamic art)
- creates tessellating patterns with common shapes, deciding which will tessellate and which will not by referring to their sides and angles

Angles

- estimates, compares and constructs angles (e.g. uses a ruler and protractor to construct a 45° angle; compares the size of angles in the environment and estimates their size)
- describes angles in the environment according to their size as acute, obtuse, right, straight, reflex or a revolution and identifies them in shapes and objects (e.g. identifies slope as angles in the environment such as the ramp outside of the school block)

Properties of shapes and objects

- classifies three-dimensional objects according to their properties (e.g. describes the difference between a triangular prism and a triangular pyramid)

- creates two-dimensional nets for pyramids and prisms

Transformations

- uses combinations of reflecting, translating and rotating shapes to describe and create patterns and solve problems
- identifies tessellations used in the environment and explains why some combinations of shapes will tessellate while others will not (e.g. tiling a wall using a combination of different shaped tiles; exploring regular and semi-regular tessellations in architectural design)
- explains the result of changing critical and non-critical properties of shapes (e.g. "if I enlarge a square, it's still a square, or if I rotate a square, it remains a square, but if I change the length of one of its sides, it's no longer a square")

Angles

- identifies supplementary and complementary angles and uses them to solve problems
- identifies that angles at a point add to 360° and that vertically opposite angles are equal and reasons to solve problems

Snapshot – Put ideas into action

Critical and Creative Thinking: Generating: Put ideas into action

Content description

AC9M4SP02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- put ideas into action by experimenting with options and predicting possible results
- put ideas into action by predicting an outcome, trialling options and assessing their effectiveness
- put ideas into action by predicting potential or future outcomes and systematically testing a range of options

Snapshot – Positioning and locating

Numeracy: Measurement and geometry: Positioning and locating

Content description

AC9M4SP02

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Using informal maps and plans

- draws an informal map or sketch to provide directions (e.g. draws a dance map when planning choreography; sketches the pathway to provide directions for a robotic vehicle to move from one location to another within a space)
- describes and locates relative positions on an informal map or plan (e.g. locates the starting position for the cross-country race using an informal map of the course; uses a seating plan to describe where they sit relative to the teacher's desk)
- orients an informal map using recognisable landmarks and current location (e.g. orients a map to show the location of the audience and locates the entry and exit points of the school gymnasium)
- locates self on an informal map to select an appropriate path to a given location

Using formal maps and plans

- locates position on maps using grid references (e.g. locates the school in cell E5; uses grid references to identify specific locations on a stage and when creating a stage plan, lighting design or prompt script)
- describes routes using landmarks and directional language including reference to quarter, half, three-quarter turns; turns to the left and right; clockwise and anticlockwise turns (e.g. communicates strategic plays in relation to coaching a team game or sport)
- interprets keys, simple scales and compass directions contained within a map to locate features (e.g. uses a map and compass directions when bush walking or orienteering)

Using proportional thinking for scaling

- interprets the scale used to create plans, drawings or maps (e.g. interprets scale to determine the approximate distance between two locations when orienteering)

- interprets and uses plans and maps involving scale (e.g. creates and interprets scale drawings when designing and making set pieces for a production)
- describes and interprets maps to determine the geographical location and positioning of states and territories within Australia and of countries relative to Australia
- interprets and uses more formal directional language such as compass bearings, degrees of turn, coordinates and distances to locate position or the distance from one location to another (e.g. identifies coordinates using GPS technologies)

AC9M4SP03

recognise and of and create symmetrical patterns and pictures, using where appropriate

-
-

Elaborations

- identifying of by tracing around various and to create an image, and using the image to test and record which different result in the same image
- using or generative artificial intelligence tool to manipulate and create symmetrical patterns; for example, creating tessellation patterns that are symmetrical and discussing any or rotational symmetries
- using stimulus materials such as the motifs in Central Asian textiles, Tibetan artefacts, Indian lotus designs and Islamic artwork to investigate and discuss and
- exploring the natural environment on to investigate and discuss patterns and symmetry of and such as in flowers, plants and landscapes

Students learn to:

recognise line and rotational symmetry of shapes and create symmetrical patterns and dynamic geometric software where appropriate

(AC9M4SP03)

General capabilities and cross-curriculum priorities

This content description connects to the following general capabilities and cross-curriculum priorities.

Creating and exchanging

- Create, communicate and collaborate

Managing and operating

- Select and operate tools

Measurement and geometry

- Understanding geometric properties

Elaborations

Content elaborations provide suggestions of ways to teach the content description and connect it to general capabilities and cross-curriculum priorities. Content elaborations are optional .

Managing and operating

- Select and operate tools

Measurement and geometry

- Understanding geometric properties
- Understanding geometric properties

Understanding Asia's global significance

- The peoples of Asia shape human endeavour through aesthetic, creative, political, sporting, economic, technological and scientific domains.

Country/Place

- First Nations communities of Australia maintain a deep connection to, and responsibility for, Country/Place and have holistic values and belief systems that are connected to the land, sea, sky and waterways.

Related content

This content description can be taught with the following content descriptions from other learning areas.

AC9HP4M03

AC9TDE4P02

Snapshot – Create, communicate and collaborate

Digital Literacy: Creating and exchanging: Create, communicate and collaborate

Content description

AC9M4SP03

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- experiment with the features of familiar digital tools to create content
- use the core features of a range of digital tools to create content and communicate and collaborate with peers and trusted adults
- select and control a variety of features in appropriate digital tools to create content and communicate and collaborate with trusted groups

Snapshot – Select and operate tools

Digital Literacy: Managing and operating: Select and operate tools

Content description

AC9M4SP03

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- use familiar digital tools to complete tasks and consolidate learning
- attempt to solve a problem before seeking help
- select and use a range of digital tools to complete tasks
- attempt to solve a problem individually and with peers before seeking help
- select and use the core features of digital tools to efficiently complete tasks
- troubleshoot basic problems and identify repetitive tasks to automate

Snapshot – Understanding geometric properties

Numeracy: Measurement and geometry: Understanding geometric properties

Content description

AC9M4SP03

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Properties of shapes and objects

- identifies the relationship between the number of sides of a two-dimensional shape and the number of vertices (e.g. if the shape has 4 4 4 sides, it has 4 4 4 vertices)
- describes and identifies the two-dimensional shapes that form the faces of three-dimensional objects (e.g. recognises the faces of a triangular prism as triangles and rectangles)
- represents shapes and objects (e.g. drawing and sketching; model building such as skeletal models and centi-cubes; using digital drawing packages; manipulates body to create shapes and objects when choreographing dance)

Transformations

- determines whether a shape has line symmetry (e.g. folds paper cut-outs of basic shapes to demonstrate which has line symmetry and which does not)
- identifies symmetry in the environment
- identifies and creates geometrical patterns involving the repetition of familiar shapes (e.g. uses pattern blocks to create a pattern and describes how the pattern was created)

Angles

- compares angles to a right angle, classifying them as greater than, less than or equal to a right angle

Properties of shapes and object

- identifies, names and classifies two-dimensional shapes according to their side and angle properties (e.g. describes a square as a regular rectangle)
- identifies key features of shapes (e.g. explains that quadrilaterals have 2 2 2 diagonals however they are not always equal in length)
- aligns three-dimensional objects to their two-dimensional nets
- identifies the relationship between the number of faces, edges and the number of vertices of a

three-dimensional object (e.g. uses a table to list the number of faces, edges and vertices of common three-dimensional objects and identifies the relationships in the data)

Transformations

- identifies that shapes can have rotational symmetry (e.g. "this drawing of a flower is symmetrical as I can spin it around both ways and it always looks exactly the same")
- creates symmetrical designs using a range of shapes and identifies the type of symmetry as appropriate (e.g. uses symmetry as a stimulus for choreographing a dance; analyses the symmetrical qualities, shapes and lines in examples of Islamic art)
- creates tessellating patterns with common shapes, deciding which will tessellate and which will not by referring to their sides and angles

Angles

- estimates, compares and constructs angles (e.g. uses a ruler and protractor to construct a 45° angle; compares the size of angles in the environment and estimates their size)
- describes angles in the environment according to their size as acute, obtuse, right, straight, reflex or a revolution and identifies them in shapes and objects (e.g. identifies slope as angles in the environment such as the ramp outside of the school block)

Properties of shapes and objects

- classifies three-dimensional objects according to their properties (e.g. describes the difference between a triangular prism and a triangular pyramid)
- creates two-dimensional nets for pyramids and prisms

Transformations

- uses combinations of reflecting, translating and rotating shapes to describe and create patterns and solve problems
- identifies tessellations used in the environment and explains why some combinations of shapes will tessellate while others will not (e.g. tiling a wall using a combination of different shaped tiles; exploring regular and semi-regular tessellations in architectural design)
- explains the result of changing critical and non-critical properties of shapes (e.g. "if I enlarge a square, it's still a square, or if I rotate a square, it remains a square, but if I change the length of one of its sides, it's no longer a square")

Angles

- identifies supplementary and complementary angles and uses them to solve problems
- identifies that angles at a point add to 360° and that vertically opposite angles are equal and reasons to solve problems

Snapshot – Select and operate tools

Digital Literacy: Managing and operating: Select and operate tools

Content description

AC9M4SP03

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- use familiar digital tools to complete tasks and consolidate learning
- attempt to solve a problem before seeking help
- select and use a range of digital tools to complete tasks
- attempt to solve a problem individually and with peers before seeking help
- select and use the core features of digital tools to efficiently complete tasks
- troubleshoot basic problems and identify repetitive tasks to automate

Snapshot – Understanding geometric properties

Numeracy: Measurement and geometry: Understanding geometric properties

Content description

AC9M4SP03

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Features of shapes and objects

- identifies and describes features of shapes and objects (e.g. sides, corners, faces, edges and

vertices)

- sorts and classifies familiar shapes and objects based on obvious features (e.g. triangles have 3 sides; a sphere is round like a ball)

Transformations

- identifies features of shapes and objects of different sizes and in different orientations in the environment (e.g. identifies a rotated view of an object made out of centicubes; compares representation of familiar shapes and objects in visual artworks from different cultures, times and places commenting on their features)
- explains that the shape or object does not change when presented in different orientations (e.g. a square remains a square when rotated)

Angles

- identifies angles in the environment (e.g. an angle formed when a door is opened; identifies that there are 4 angles in a square)

Properties of shapes and objects

- identifies the relationship between the number of sides of a two-dimensional shape and the number of vertices (e.g. if the shape has 4 sides, it has 4 vertices)
- describes and identifies the two-dimensional shapes that form the faces of three-dimensional objects (e.g. recognises the faces of a triangular prism as triangles and rectangles)
- represents shapes and objects (e.g. drawing and sketching; model building such as skeletal models and centi-cubes; using digital drawing packages; manipulates body to create shapes and objects when choreographing dance)

Transformations

- determines whether a shape has line symmetry (e.g. folds paper cut-outs of basic shapes to demonstrate which has line symmetry and which does not)
- identifies symmetry in the environment
- identifies and creates geometrical patterns involving the repetition of familiar shapes (e.g. uses pattern blocks to create a pattern and describes how the pattern was created)

Angles

- compares angles to a right angle, classifying them as greater than, less than or equal to a right angle

Properties of shapes and object

- identifies, names and classifies two-dimensional shapes according to their side and angle properties (e.g. describes a square as a regular rectangle)
- identifies key features of shapes (e.g. explains that quadrilaterals have 2 diagonals however they are not always equal in length)
- aligns three-dimensional objects to their two-dimensional nets
- identifies the relationship between the number of faces, edges and the number of vertices of a three-dimensional object (e.g. uses a table to list the number of faces, edges and vertices of common three-dimensional objects and identifies the relationships in the data)

Transformations

- identifies that shapes can have rotational symmetry (e.g. "this drawing of a flower is symmetrical as I can spin it around both ways and it always looks exactly the same")
- creates symmetrical designs using a range of shapes and identifies the type of symmetry as appropriate (e.g. uses symmetry as a stimulus for choreographing a dance; analyses the symmetrical qualities, shapes and lines in examples of Islamic art)
- creates tessellating patterns with common shapes, deciding which will tessellate and which will not by referring to their sides and angles

Angles

- estimates, compares and constructs angles (e.g. uses a ruler and protractor to construct a 45° angle; compares the size of angles in the environment and estimates their size)
- describes angles in the environment according to their size as acute, obtuse, right, straight, reflex or a revolution and identifies them in shapes and objects (e.g. identifies slope as angles in the environment such as the ramp outside of the school block)

Snapshot – Understanding geometric properties

Numeracy: Measurement and geometry: Understanding geometric properties

Content description

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Properties of shapes and objects

- identifies the relationship between the number of sides of a two-dimensional shape and the number of vertices (e.g. if the shape has 4 4 4 sides, it has 4 4 4 vertices)
- describes and identifies the two-dimensional shapes that form the faces of three-dimensional objects (e.g. recognises the faces of a triangular prism as triangles and rectangles)
- represents shapes and objects (e.g. drawing and sketching; model building such as skeletal models and centi-cubes; using digital drawing packages; manipulates body to create shapes and objects when choreographing dance)

Transformations

- determines whether a shape has line symmetry (e.g. folds paper cut-outs of basic shapes to demonstrate which has line symmetry and which does not)
- identifies symmetry in the environment
- identifies and creates geometrical patterns involving the repetition of familiar shapes (e.g. uses pattern blocks to create a pattern and describes how the pattern was created)

Angles

- compares angles to a right angle, classifying them as greater than, less than or equal to a right angle

Properties of shapes and object

- identifies, names and classifies two-dimensional shapes according to their side and angle properties (e.g. describes a square as a regular rectangle)
- identifies key features of shapes (e.g. explains that quadrilaterals have 2 2 2 diagonals however they are not always equal in length)
- aligns three-dimensional objects to their two-dimensional nets
- identifies the relationship between the number of faces, edges and the number of vertices of a three-dimensional object (e.g. uses a table to list the number of faces, edges and vertices of common three-dimensional objects and identifies the relationships in the data)

Transformations

- identifies that shapes can have rotational symmetry (e.g. "this drawing of a flower is symmetrical as I can spin it around both ways and it always looks exactly the same")
- creates symmetrical designs using a range of shapes and identifies the type of symmetry as appropriate (e.g. uses symmetry as a stimulus for choreographing a dance; analyses the symmetrical qualities, shapes and lines in examples of Islamic art)
- creates tessellating patterns with common shapes, deciding which will tessellate and which will not by referring to their sides and angles

Angles

- estimates, compares and constructs angles (e.g. uses a ruler and protractor to construct a 45° angle; compares the size of angles in the environment and estimates their size)
- describes angles in the environment according to their size as acute, obtuse, right, straight, reflex or a revolution and identifies them in shapes and objects (e.g. identifies slope as angles in the environment such as the ramp outside of the school block)

Properties of shapes and objects

- classifies three-dimensional objects according to their properties (e.g. describes the difference between a triangular prism and a triangular pyramid)
- creates two-dimensional nets for pyramids and prisms

Transformations

- uses combinations of reflecting, translating and rotating shapes to describe and create patterns and solve problems
- identifies tessellations used in the environment and explains why some combinations of shapes will tessellate while others will not (e.g. tiling a wall using a combination of different shaped tiles; exploring regular and semi-regular tessellations in architectural design)
- explains the result of changing critical and non-critical properties of shapes (e.g. "if I enlarge a square, it's still a square, or if I rotate a square, it remains a square, but if I change the

length of one of its sides, it's no longer a square")

Angles

- identifies supplementary and complementary angles and uses them to solve problems
- identifies that angles at a point add to 360 360 3 6 0 ° and that vertically opposite angles are equal and reasons to solve problems

AC9M4ST01

for categorical and discrete to address a question of interest or purpose, using ; represent using many-to-one pictographs, and other displays or ; interpret and discuss the information that has been created

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Elaborations

- investigating many-to-one using and graphical software, interpreting and discussing key features
- understanding that can be represented with one symbol representing more than one piece of , and that it is important to read all information about a representation before making judgements
- constructing graphs of collected through observation during science experiments, recording, interpreting and discussing the results in terms of the scientific study
- co-creating an online poll to students in their school about a topic of interest, exploring how online platforms use generative artificial intelligence to make word clouds, quizzes, polls and graphical representations of the collected
- acquiring of using practical activities, observations or repeated , recording using tally charts, digital tables or sheets, graphing, discussing and comparing the results using a
- using secondary of fire burns to that assist First Nations Ranger Groups and other groups to care for

Students learn to:

acquire data for categorical and discrete numerical variables to address a question purpose, using digital tools; represent data using many-to-one pictographs, column displays or visualisations; interpret and discuss the information that has been creat

(AC9M4ST01)

General capabilities and cross-curriculum priorities

This content description connects to the following general capabilities and cross-curriculum priorities.

Creating and exchanging

- Create, communicate and collaborate

Managing and operating

- Select and operate tools

Statistics and probability

- Interpreting and representing data

Elaborations

Content elaborations provide suggestions of ways to teach the content description and connect it to general capabilities and cross-curriculum priorities. Content elaborations are optional .

Analysing

- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Creating and exchanging

- Create, communicate and collaborate

Managing and operating

- Select and operate tools

Analysing

- Interpret concepts and problems
- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Analysing

- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Creating and exchanging

- Create, communicate and collaborate

Statistics and probability

- Interpreting and representing data

Analysing

- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Investigating

- Acquire and collate data
- Interpret data

Country/Place

- First Nations communities of Australia maintain a deep connection to, and responsibility for, Country/Place and have holistic values and belief systems that are connected to the land, sea, sky and waterways.

Related content

This content description can be taught with the following content descriptions from other learning areas.

AC9HP4P09

AC9HS4S02

AC9HS4S03

AC9S4I04

AC9TDI4K03

Snapshot – Create, communicate and collaborate

Digital Literacy: Creating and exchanging: Create, communicate and collaborate

Content description

AC9M4ST01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- experiment with the features of familiar digital tools to create content
- use the core features of a range of digital tools to create content and communicate and collaborate with peers and trusted adults
- select and control a variety of features in appropriate digital tools to create content and communicate and collaborate with trusted groups

Snapshot – Select and operate tools

Digital Literacy: Managing and operating: Select and operate tools

Content description

AC9M4ST01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- use familiar digital tools to complete tasks and consolidate learning
- attempt to solve a problem before seeking help
- select and use a range of digital tools to complete tasks
- attempt to solve a problem individually and with peers before seeking help
- select and use the core features of digital tools to efficiently complete tasks
- troubleshoot basic problems and identify repetitive tasks to automate

Snapshot – Interpreting and representing data

Numeracy: Statistics and probability: Interpreting and representing data

Content description

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Collecting, displaying and interpreting categorical data

- designs survey questions to collect categorical data (e.g. creates a suite of survey questions to plan the end of year class party)
- collects, records and displays one-variable data in variety of ways such as tables, charts, plots and graphs using the appropriate digital tools (e.g. uses a spreadsheet to record data collected in a class survey and generates a column graph to display the results)
- displays and interprets categorical data in one-to-many data displays
- interprets and represents categorical data in simple displays such as bar and column graphs, pie charts, models, maps, colour wheels, and pictorial timelines, and makes simple inferences from such displays
- makes comparisons from categorical data displays using relative heights from a common baseline (e.g. compares the heights of the columns in a simple column graph to determine the tallest and recognises this as the most frequent response)

Collecting, displaying and interpreting numerical data

- collects and records discrete numerical data using an appropriate method for recording (e.g. uses a frequency table to record the experimental results for rolling a dice; records sample measurements taken during a science investigation)
- constructs graphical representations of numerical data and explains the difference between continuous and discrete data (e.g. explains that measurements such as length, mass and temperature are continuous data whereas a count such as the number of people in a queue is discrete)
- explains how data displays can be misleading (e.g. whether a scale should start at zero; not using uniform intervals on the axes)
- interprets visual representations of data displayed using a multi-unit scale, reading values between the marked units and describing any variation and trends in the data

Collecting, displaying, interpreting and analysing numerical data

- poses questions based on variations in continuous numerical data and chooses the appropriate method to collect and record data (e.g. collects information on the heights of buildings or daily temperatures, tabulates the results and represents these graphically; uses a survey to collect primary data or secondary data extracted from census data)
- uses numerical and graphical representations relevant to the purpose of the collection of the data and explains their reasoning (e.g. "I can't use a frequency histogram for categorical data because there is no numerical connection between the categories"; converts their data to percentages in order to compare the girls' results to those of the boys, as the total number of boys and girls who participated in the survey was different)
- determines and calculates the most appropriate statistic to describe the spread of data (e.g. when creating an infographic, uses the mean of the data to describe household income and the median of the data for house prices)
- calculates simple descriptive statistics such as mode, mean or median as measures to represent typical values of a distribution (e.g. describes the mean kilojoule intake and median hours of exercise of a sample population when investigating community health and wellbeing; describes central tendency when analysing road safety statistics)
- compares the usefulness of different representations of the same data (e.g. chooses to use a line graph to illustrate trends, a bar graph to compare the living standards of different economies and a histogram to show income distribution)
- describes the spread of a data distribution in terms of the range, clusters, skewness and symmetry of the graphical display, and determines and makes connections to the mode, median and mean of the data

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4ST01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Create, communicate and collaborate

Digital Literacy: Creating and exchanging: Create, communicate and collaborate

Content description

AC9M4ST01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- experiment with the features of familiar digital tools to create content
- use the core features of a range of digital tools to create content and communicate and collaborate with peers and trusted adults
- select and control a variety of features in appropriate digital tools to create content and communicate and collaborate with trusted groups

Snapshot – Select and operate tools

Digital Literacy: Managing and operating: Select and operate tools

Content description

AC9M4ST01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- use familiar digital tools to complete tasks and consolidate learning
- attempt to solve a problem before seeking help
- select and use a range of digital tools to complete tasks
- attempt to solve a problem individually and with peers before seeking help
- select and use the core features of digital tools to efficiently complete tasks
- troubleshoot basic problems and identify repetitive tasks to automate

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4ST01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that

approaches may change depending on the subject or learning area

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4ST01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4ST01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4ST01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4ST01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Create, communicate and collaborate

Digital Literacy: Creating and exchanging: Create, communicate and collaborate

Content description

AC9M4ST01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- experiment with the features of familiar digital tools to create content
- use the core features of a range of digital tools to create content and communicate and collaborate with peers and trusted adults
- select and control a variety of features in appropriate digital tools to create content and communicate and collaborate with trusted groups

Snapshot – Interpreting and representing data

Numeracy: Statistics and probability: Interpreting and representing data

Content description

AC9M4ST01

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Collecting, displaying and interpreting categorical data

- designs survey questions to collect categorical data (e.g. creates a suite of survey questions to plan the end of year class party)
- collects, records and displays one-variable data in variety of ways such as tables, charts, plots and graphs using the appropriate digital tools (e.g. uses a spreadsheet to record data collected in a class survey and generates a column graph to display the results)
- displays and interprets categorical data in one-to-many data displays
- interprets and represents categorical data in simple displays such as bar and column graphs, pie charts, models, maps, colour wheels, and pictorial timelines, and makes simple inferences from such displays
- makes comparisons from categorical data displays using relative heights from a common baseline (e.g. compares the heights of the columns in a simple column graph to determine the tallest and recognises this as the most frequent response)

Collecting, displaying and interpreting numerical data

- collects and records discrete numerical data using an appropriate method for recording (e.g. uses a frequency table to record the experimental results for rolling a dice; records sample measurements taken during a science investigation)
- constructs graphical representations of numerical data and explains the difference between continuous and discrete data (e.g. explains that measurements such as length, mass and temperature are continuous data whereas a count such as the number of people in a queue is discrete)
- explains how data displays can be misleading (e.g. whether a scale should start at zero; not using uniform intervals on the axes)
- interprets visual representations of data displayed using a multi-unit scale, reading values between the marked units and describing any variation and trends in the data

Collecting, displaying, interpreting and analysing numerical data

- poses questions based on variations in continuous numerical data and chooses the appropriate method to collect and record data (e.g. collects information on the heights of buildings or daily temperatures, tabulates the results and represents these graphically; uses a survey to collect primary data or secondary data extracted from census data)
- uses numerical and graphical representations relevant to the purpose of the collection of the data and explains their reasoning (e.g. "I can't use a frequency histogram for categorical data because there is no numerical connection between the categories"; converts their data to percentages in order to compare the girls' results to those of the boys, as the total number of boys and girls who participated in the survey was different)
- determines and calculates the most appropriate statistic to describe the spread of data (e.g. when creating an infographic, uses the mean of the data to describe household income and the median of the data for house prices)

- calculates simple descriptive statistics such as mode, mean or median as measures to represent typical values of a distribution (e.g. describes the mean kilojoule intake and median hours of exercise of a sample population when investigating community health and wellbeing; describes central tendency when analysing road safety statistics)
- compares the usefulness of different representations of the same data (e.g. chooses to use a line graph to illustrate trends, a bar graph to compare the living standards of different economies and a histogram to show income distribution)
- describes the spread of a data distribution in terms of the range, clusters, skewness and symmetry of the graphical display, and determines and makes connections to the mode, median and mean of the data

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4ST01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4ST01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Acquire and collate data

Digital Literacy: Investigating: Acquire and collate data

Content description

AC9M4ST01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- collect data by counting, measuring and observing with familiar digital tools
- collect and access data using a range of digital tools and methods in response to a defined question
- collect and access data using a range of digital tools and methods in response to a defined question or problem

Snapshot – Interpret data

Digital Literacy: Investigating: Interpret data

Content description

AC9M4ST01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- classify and group data using digital familiar tools to answer simple questions
- organise, summarise and visualise data using a range of digital tools to identify patterns and answer questions
- analyse and visualise data using a range of digital tools to identify patterns and make predictions

AC9M4ST02

analyse the effectiveness of different displays or in illustrating and comparing , then discuss the of distributions and the in the

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-

Elaborations

- suggesting questions that can be answered by a given display and using the display to answer these questions
- interpreting representations in the media and other forums where symbols represent one-to-many relationships and how this can be challenging when the representations use part-whole representations
- comparing different student generated diagrams, tables and graphs, describing their similarities and differences and commenting on the usefulness of each representation for interpreting the
- discussing how analysing and visualising is a fundamental step in preparation for AI developers

Students learn to:

analyse the effectiveness of different displays or visualisations in illustrating and co distributions, then discuss the shape of distributions and the variation in the data

(AC9M4ST02)

General capabilities and cross-curriculum priorities

This content description connects to the following general capabilities and cross-curriculum priorities.

Analysing

- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Statistics and probability

- Interpreting and representing data

Elaborations

Content elaborations provide suggestions of ways to teach the content description and connect it to general capabilities and cross-curriculum priorities. Content elaborations are optional .

Inquiring

- Develop questions

Speaking and listening

- Speaking

Analysing

- Interpret concepts and problems

Analysing

- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Statistics and probability

- Interpreting and representing data

Related content

This content description can be taught with the following content descriptions from other learning areas.

AC9HS4S02

AC9HS4S03

AC9TDI4K03

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4ST02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4ST02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Interpreting and representing data

Numeracy: Statistics and probability: Interpreting and representing data

Content description

AC9M4ST02

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Collecting, displaying and interpreting categorical data

- designs survey questions to collect categorical data (e.g. creates a suite of survey questions to plan the end of year class party)
- collects, records and displays one-variable data in variety of ways such as tables, charts, plots and graphs using the appropriate digital tools (e.g. uses a spreadsheet to record data collected in a class survey and generates a column graph to display the results)
- displays and interprets categorical data in one-to-many data displays
- interprets and represents categorical data in simple displays such as bar and column graphs, pie charts, models, maps, colour wheels, and pictorial timelines, and makes simple inferences from such displays
- makes comparisons from categorical data displays using relative heights from a common baseline (e.g. compares the heights of the columns in a simple column graph to determine the tallest and recognises this as the most frequent response)

Collecting, displaying and interpreting numerical data

- collects and records discrete numerical data using an appropriate method for recording (e.g. uses a frequency table to record the experimental results for rolling a dice; records sample measurements taken during a science investigation)
- constructs graphical representations of numerical data and explains the difference between continuous and discrete data (e.g. explains that measurements such as length, mass and temperature are continuous data whereas a count such as the number of people in a queue is discrete)
- explains how data displays can be misleading (e.g. whether a scale should start at zero; not using uniform intervals on the axes)

- interprets visual representations of data displayed using a multi-unit scale, reading values between the marked units and describing any variation and trends in the data

Collecting, displaying, interpreting and analysing numerical data

- poses questions based on variations in continuous numerical data and chooses the appropriate method to collect and record data (e.g. collects information on the heights of buildings or daily temperatures, tabulates the results and represents these graphically; uses a survey to collect primary data or secondary data extracted from census data)
- uses numerical and graphical representations relevant to the purpose of the collection of the data and explains their reasoning (e.g. "I can't use a frequency histogram for categorical data because there is no numerical connection between the categories"; converts their data to percentages in order to compare the girls' results to those of the boys, as the total number of boys and girls who participated in the survey was different)
- determines and calculates the most appropriate statistic to describe the spread of data (e.g. when creating an infographic, uses the mean of the data to describe household income and the median of the data for house prices)
- calculates simple descriptive statistics such as mode, mean or median as measures to represent typical values of a distribution (e.g. describes the mean kilojoule intake and median hours of exercise of a sample population when investigating community health and wellbeing; describes central tendency when analysing road safety statistics)
- compares the usefulness of different representations of the same data (e.g. chooses to use a line graph to illustrate trends, a bar graph to compare the living standards of different economies and a histogram to show income distribution)
- describes the spread of a data distribution in terms of the range, clusters, skewness and symmetry of the graphical display, and determines and makes connections to the mode, median and mean of the data

Snapshot – Develop questions

Critical and Creative Thinking: Inquiring: Develop questions

Content description

AC9M4ST02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- develop questions to explore a familiar idea or topic
- questions developed are fit for the purpose of the investigation
- develop questions to examine unfamiliar ideas and topics
- questions developed support the process of improving knowledge and understanding about a topic or investigation
- develop questions to examine unfamiliar ideas and topics
- questions developed focus on improving understanding about a topic and clarifying information about processes or procedures

Snapshot – Speaking

Literacy: Speaking and listening: Speaking

Content description

AC9M4ST02

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Crafting ideas

- creates spoken texts for a range of purposes across learning areas (e.g. explains how the mathematics problem was solved)
- uses complex sentence constructions including relative clauses (e.g. "The boy who drew the picture got a prize.") (see Grammar)
- adjusts register according to purpose and audience
- elaborates on ideas using a short sequence of sentences
- incorporates learnt content into spoken text
- sequences ideas and events appropriately

- uses mainly correct grammatical constructions (e.g. pronoun references; noun-verb agreement)
- varies volume and intonation to suit purpose and audience
- plans and delivers spoken presentations using appropriate structure and language
- includes video and audio enhancements to spoken texts, where appropriate (e.g. includes slides or pictures in a spoken presentation)

Vocabulary

- experiments with vocabulary drawn from a variety of sources
- uses adverbials to give more precise meaning to verbs (e.g. talking loudly) (see Grammar)
- uses a range of vocabulary to indicate connections (e.g. consequences)
- uses conditional vocabulary to expand upon ideas (e.g. "If Goldilocks ate all the porridge the bears would be hungry.")

Crafting ideas

- creates detailed spoken texts on a broad range of learning area topics
- includes details and elaborations to expand ideas
- uses connectives to signal a change in relationship (e.g. "however", "although", "on the other hand") or to show causal relationships (e.g. "due to", "since") (see Grammar)
- uses a range of expressions to introduce an alternative point of view (e.g. "in my opinion", "he did not agree with")
- rehearses spoken text to accommodate time and technology
- controls tone, volume, pitch and pace to suit content and audience
- uses technologies or audio and visual features to enhance spoken text (e.g. videos a spoken presentation with music, sound effect enhancements)

Vocabulary

- uses a broader range of more complex noun groups/phrases to expand description (e.g. "protective, outer covering")
- selects more specific and precise words to replace general words (e.g. uses "difficult" or "challenging" for "hard")
- uses some rhetorical devices (e.g. "don't you agree?")

Crafting ideas

- creates spoken texts responsive to audience and a broad range of learning area topics, clearly articulating words and ideas
- organises more complex ideas or concepts logically, selecting details to accentuate key points
- speaks audibly and coherently to a less familiar audience for a sustained period
- shows increasing awareness of audience by moderating length, content and delivery of spoken texts
- adjusts register according to purpose and audience
- does research to prepare spoken texts
- uses a range of technology, and audio and visual resources to engage audience and enhance content

Vocabulary

- varies vocabulary to add interest and to describe with greater precision (e.g. uses topic-specific noun groups/phrases such as "exploitation of resources") (see Grammar)
- uses language creatively (e.g. "the moon shines bravely")
- uses sensory vocabulary to engage the audience (e.g. "a gasp of dismay")
- uses technical vocabulary to demonstrate topic knowledge (e.g. "deforestation")
- consistently uses a range of synonyms to add variety and precision to spoken text
- uses abstractions (e.g. "freedom", "fairness")

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4ST02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4ST02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4ST02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Interpreting and representing data

Numeracy: Statistics and probability: Interpreting and representing data

Content description

AC9M4ST02

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Collecting, displaying and interpreting categorical data

- designs survey questions to collect categorical data (e.g. creates a suite of survey questions to plan the end of year class party)
- collects, records and displays one-variable data in variety of ways such as tables, charts, plots and graphs using the appropriate digital tools (e.g. uses a spreadsheet to record data collected in a class survey and generates a column graph to display the results)
- displays and interprets categorical data in one-to-many data displays
- interprets and represents categorical data in simple displays such as bar and column graphs, pie charts, models, maps, colour wheels, and pictorial timelines, and makes simple inferences from such displays
- makes comparisons from categorical data displays using relative heights from a common baseline (e.g. compares the heights of the columns in a simple column graph to determine the tallest and recognises this as the most frequent response)

Collecting, displaying and interpreting numerical data

- collects and records discrete numerical data using an appropriate method for recording (e.g. uses a frequency table to record the experimental results for rolling a dice; records sample measurements taken during a science investigation)
- constructs graphical representations of numerical data and explains the difference between continuous and discrete data (e.g. explains that measurements such as length, mass and temperature are continuous data whereas a count such as the number of people in a queue is discrete)
- explains how data displays can be misleading (e.g. whether a scale should start at zero; not using

uniform intervals on the axes)

- interprets visual representations of data displayed using a multi-unit scale, reading values between the marked units and describing any variation and trends in the data

Collecting, displaying, interpreting and analysing numerical data

- poses questions based on variations in continuous numerical data and chooses the appropriate method to collect and record data (e.g. collects information on the heights of buildings or daily temperatures, tabulates the results and represents these graphically; uses a survey to collect primary data or secondary data extracted from census data)
- uses numerical and graphical representations relevant to the purpose of the collection of the data and explains their reasoning (e.g. "I can't use a frequency histogram for categorical data because there is no numerical connection between the categories"; converts their data to percentages in order to compare the girls' results to those of the boys, as the total number of boys and girls who participated in the survey was different)
- determines and calculates the most appropriate statistic to describe the spread of data (e.g. when creating an infographic, uses the mean of the data to describe household income and the median of the data for house prices)
- calculates simple descriptive statistics such as mode, mean or median as measures to represent typical values of a distribution (e.g. describes the mean kilojoule intake and median hours of exercise of a sample population when investigating community health and wellbeing; describes central tendency when analysing road safety statistics)
- compares the usefulness of different representations of the same data (e.g. chooses to use a line graph to illustrate trends, a bar graph to compare the living standards of different economies and a histogram to show income distribution)
- describes the spread of a data distribution in terms of the range, clusters, skewness and symmetry of the graphical display, and determines and makes connections to the mode, median and mean of the data

AC9M4ST03

conduct , collecting through responses and other methods; record and display using ; interpret the and communicate the results

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Elaborations

- creating a to collect class responses to a preferred movie choice, and recording responses using spreadsheets; graphing using a or other appropriate representations and interpreting the results of the reporting findings back to the class
- conducting a statistical investigation and acquiring from different online sources; for example, using online query interfaces to select and retrieve from an online database such as weather records, Google Trends or the World Health Organization
- investigating different in which can take place and the types of questions to ask to collect relevant to the ; for example, investigating supermarket customer complaints that breakfast cereals with the most sugar are positioned at children's eye level, discussing what questions they would need to ask and answer

Students learn to:

**conduct statistical investigations, collecting data through survey responses and otl
record and display data using digital tools; interpret the data and communicate the**

(AC9M4ST03)

General capabilities and cross-curriculum priorities

This content description connects to the following general capabilities and cross-curriculum priorities.

Analysing

- Draw conclusions and provide reasons

Inquiring

- Develop questions

Creating and exchanging

- Create, communicate and collaborate

Statistics and probability

- Interpreting and representing data

Elaborations

Content elaborations provide suggestions of ways to teach the content description and connect it to general capabilities and cross-curriculum priorities. Content elaborations are optional .

Analysing

- Draw conclusions and provide reasons

Inquiring

- Develop questions
- Identify, process and evaluate information

Creating and exchanging

- Create, communicate and collaborate

Investigating

- Interpret data

Managing and operating

- Select and operate tools

Analysing

- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Creating and exchanging

- Create, communicate and collaborate

Investigating

- Interpret data

Managing and operating

- Select and operate tools

Analysing

- Draw conclusions and provide reasons

Inquiring

- Develop questions
- Identify, process and evaluate information

Related content

This content description can be taught with the following content descriptions from other learning areas.

AC9HS4S02

AC9HS4S03

AC9S4I02

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4ST03

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Develop questions

Critical and Creative Thinking: Inquiring: Develop questions

Content description

AC9M4ST03

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- develop questions to explore a familiar idea or topic
- questions developed are fit for the purpose of the investigation
- develop questions to examine unfamiliar ideas and topics
- questions developed support the process of improving knowledge and understanding about a topic or investigation
- develop questions to examine unfamiliar ideas and topics
- questions developed focus on improving understanding about a topic and clarifying information about processes or procedures

Snapshot – Create, communicate and collaborate

Digital Literacy: Creating and exchanging: Create, communicate and collaborate

Content description

AC9M4ST03

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- experiment with the features of familiar digital tools to create content
- use the core features of a range of digital tools to create content and communicate and collaborate with peers and trusted adults
- select and control a variety of features in appropriate digital tools to create content and communicate and collaborate with trusted groups

Snapshot – Interpreting and representing data

Numeracy: Statistics and probability: Interpreting and representing data

Content description

AC9M4ST03

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Collecting, displaying and interpreting categorical data

- designs survey questions to collect categorical data (e.g. creates a suite of survey questions to plan the end of year class party)
- collects, records and displays one-variable data in variety of ways such as tables, charts, plots and graphs using the appropriate digital tools (e.g. uses a spreadsheet to record data collected in a class survey and generates a column graph to display the results)
- displays and interprets categorical data in one-to-many data displays
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- makes comparisons from categorical data displays using relative heights from a common baseline (e.g. compares the heights of the columns in a simple column graph to determine the tallest and recognises this as the most frequent response)

Collecting, displaying and interpreting numerical data

- collects and records discrete numerical data using an appropriate method for recording (e.g. uses a frequency table to record the experimental results for rolling a dice; records sample measurements taken during a science investigation)
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- explains how data displays can be misleading (e.g. whether a scale should start at zero; not using uniform intervals on the axes)
- interprets visual representations of data displayed using a multi-unit scale, reading values between the marked units and describing any variation and trends in the data

Collecting, displaying, interpreting and analysing numerical data

- poses questions based on variations in continuous numerical data and chooses the appropriate

method to collect and record data (e.g. collects information on the heights of buildings or daily temperatures, tabulates the results and represents these graphically; uses a survey to collect primary data or secondary data extracted from census data)

- uses numerical and graphical representations relevant to the purpose of the collection of the data and explains their reasoning (e.g. "I can't use a frequency histogram for categorical data because there is no numerical connection between the categories"; converts their data to percentages in order to compare the girls' results to those of the boys, as the total number of boys and girls who participated in the survey was different)
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- calculates simple descriptive statistics such as mode, mean or median as measures to represent typical values of a distribution (e.g. describes the mean kilojoule intake and median hours of exercise of a sample population when investigating community health and wellbeing; describes central tendency when analysing road safety statistics)
- compares the usefulness of different representations of the same data (e.g. chooses to use a line graph to illustrate trends, a bar graph to compare the living standards of different economies and a histogram to show income distribution)
- describes the spread of a data distribution in terms of the range, clusters, skewness and symmetry of the graphical display, and determines and makes connections to the mode, median and mean of the data

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4ST03

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Develop questions

Critical and Creative Thinking: Inquiring: Develop questions

Content description

AC9M4ST03

Continuum extract

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- questions developed support the process of improving knowledge and understanding about a topic or investigation
- develop questions to examine unfamiliar ideas and topics
- questions developed focus on improving understanding about a topic and clarifying information about processes or procedures

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4ST03

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources

- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Create, communicate and collaborate

Digital Literacy: Creating and exchanging: Create, communicate and collaborate

Content description

AC9M4ST03

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- experiment with the features of familiar digital tools to create content
- use the core features of a range of digital tools to create content and communicate and collaborate with peers and trusted adults
- select and control a variety of features in appropriate digital tools to create content and communicate and collaborate with trusted groups

Snapshot – Interpret data

Digital Literacy: Investigating: Interpret data

Content description

AC9M4ST03

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- classify and group data using digital familiar tools to answer simple questions
- organise, summarise and visualise data using a range of digital tools to identify patterns and answer questions
- analyse and visualise data using a range of digital tools to identify patterns and make predictions

Snapshot – Select and operate tools

Digital Literacy: Managing and operating: Select and operate tools

Content description

AC9M4ST03

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- use familiar digital tools to complete tasks and consolidate learning
- attempt to solve a problem before seeking help
- select and use a range of digital tools to complete tasks
- attempt to solve a problem individually and with peers before seeking help
- select and use the core features of digital tools to efficiently complete tasks
- troubleshoot basic problems and identify repetitive tasks to automate

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4ST03

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4ST03

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Create, communicate and collaborate

Digital Literacy: Creating and exchanging: Create, communicate and collaborate

Content description

AC9M4ST03

Continuum extract

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- experiment with the features of familiar digital tools to create content
- use the core features of a range of digital tools to create content and communicate and collaborate with peers and trusted adults
- select and control a variety of features in appropriate digital tools to create content and communicate and collaborate with trusted groups

Snapshot – Interpret data

Digital Literacy: Investigating: Interpret data

Content description

AC9M4ST03

Continuum extract

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Snapshot – Select and operate tools

Digital Literacy: Managing and operating: Select and operate tools

Content description

AC9M4ST03

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- attempt to solve a problem individually and with peers before seeking help
- select and use the core features of digital tools to efficiently complete tasks
- troubleshoot basic problems and identify repetitive tasks to automate

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4ST03

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Develop questions

Critical and Creative Thinking: Inquiring: Develop questions

Content description

AC9M4ST03

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- develop questions to explore a familiar idea or topic
- questions developed are fit for the purpose of the investigation
- develop questions to examine unfamiliar ideas and topics
- questions developed support the process of improving knowledge and understanding about a topic or investigation
- develop questions to examine unfamiliar ideas and topics
- questions developed focus on improving understanding about a topic and clarifying information about processes or procedures

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4ST03

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

AC9M4P01

describe possible everyday and the possible outcomes of and order outcomes or based on their likelihood of occurring; identify independent or dependent

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Elaborations

- using lists of familiar to students and ordering them from “least likely” to “most likely” to occur; considering and discussing why the order of some might be different for different students
- predicting the outcome of a coin toss after 5 5 5 heads have been flipped in a row, discussing the assertion that because so many heads came up, it is more likely that a tail rather than a head will come up next; discussing with reasons why the assumption is correct or incorrect
- predicting how likely, from least likely to most likely, of selecting a red ball from a bag containing 10 10 1 0 red balls and 5 5 5 white balls, a bag containing 20 20 2 0 of each, or one that has 25 25 2 5 red balls and 20 20 2 0 white balls, justifying their decision
- identifying school activities where the chance of them taking place is affected by the chance of other occurring; for example, given that there is a high chance of a storm on Friday, there is only a small chance that the coastal dune planting project will go ahead
- listing the outcomes of everyday chance situations and identifying where one cannot happen if the

other happens; for example, discussing that it cannot be hot and cold at the same time; selecting a card from a deck and discussing if it is red it cannot be a spade or a club

- identifying different dependent where the chance of one outcome occurring will be affected by the occurrence of other outcomes and different independent where the chance of one outcome occurring will not be affected by the occurrence of other outcome(s)
- exploring how ordering outcomes based on their likelihood of occurring is an essential component of early warning systems that use artificial intelligence to make decisions, such as natural disaster warning systems
- discussing how likelihood relates to the decisions an artificial intelligence tool makes when generating predictive text; for example, discussing which word would most likely come next in a sentence, then refining the decision as the first letter is revealed

Students learn to:

describe possible everyday events and the possible outcomes of chance experiments or events based on their likelihood of occurring; identify independent or dependent

(AC9M4P01)

General capabilities and cross-curriculum priorities

This content description connects to the following general capabilities and cross-curriculum priorities.

Generating

- Consider alternatives

Inquiring

- Identify, process and evaluate information

Statistics and probability

- Understanding chance

Elaborations

Content elaborations provide suggestions of ways to teach the content description and connect it to general capabilities and cross-curriculum priorities. Content elaborations are optional .

Generating

- Consider alternatives

Inquiring

- Identify, process and evaluate information

Generating

- Consider alternatives

Inquiring

- Identify, process and evaluate information

Analysing

- Draw conclusions and provide reasons

Generating

- Consider alternatives

Inquiring

- Identify, process and evaluate information

Generating

- Consider alternatives

Inquiring

- Identify, process and evaluate information

Snapshot – Consider alternatives

Critical and Creative Thinking: Generating: Consider alternatives

Content description

AC9M4P01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- consider alternatives and explore different or creative ways to approach a task or problem
- consider alternatives by comparing different or creative ways to approach a task, issue or problem and recommend a preferred option

- consider alternatives by challenging or creatively adjusting existing ideas in situations where current approaches do not work and recommend a preferred option

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4P01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Understanding chance

Numeracy: Statistics and probability: Understanding chance

Content description

AC9M4P01

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Comparing chance

- describes and orders the likelihood of events in non-quantitative terms such as certain, likely, highly likely, unlikely, impossible (e.g. "if there are more blue than red marbles in a bag, blue is more likely to be selected"; "I am certain that I won't win the competition because I didn't enter")
- records outcomes of chance experiments in tables and charts
- demonstrates that outcomes of chance experiments may differ from expected results (e.g. we will not get the same results every time we roll a dice)
- draws conclusions that recognise variation in results of chance experiments (e.g. you rolled a lot of sixes this game, I hope I get more sixes next time)

Fairness

- identifies all possible outcomes of one-step experiments and records outcomes in tables and charts
- explains why outcomes of chance experiments may differ from expected results (e.g. "just because there are 6 6 6 numbers on a dice doesn't mean you are going to roll a 6 6 6 every 6 6 6 rolls, you may not roll a 6 6 6 in the entire game")
- explains the difference between the notion of equal likelihood of possible outcomes and those that are not equally likely (e.g. explains the use of phrases such as fifty-fifty when there are 2 2 2 outcomes and when 2 2 2 events occurring are equally likely as opposed to head and tail are more likely than 2 2 2 heads or 2 2 2 tails)
- identifies unfair elements in games that affect the chances of winning (e.g. having an unequal number of turns; weighted dice)
- explains that the outcomes of chance events are either "certain to happen", "certain not to happen" or lie somewhere in between and knows that impossible events are events that are "certain not to happen"
- identifies events where the chance of one event occurring will not affect the occurrence of the other (e.g. if a coin is tossed and heads have come up 7 7 7 times in a row, it is still equally likely that the next toss will be either a head or a tail)

Probabilities

- expresses the theoretical probability of an event as the number of ways an event can happen out of the total number of possibilities
- identifies a range of chance events that have a probability from 0 – 1 0 – 1 0 – 1 (e.g. you have zero probability of rolling a 7 7 7 with one roll of a standard 6 6 6 -sided dice; the probability

that tomorrow is Wednesday given today is Tuesday is one)

- describes probabilities as fractions of one (e.g. the probability of an even number when rolling a dice is $\frac{3}{6}$)
- expresses probabilities as fractions, decimals, percentages and ratios recognising that all probabilities lie on a measurement scale of zero to one (e.g. uses numerical representations such as 75 % chance of rain or 4 out of 5 people liked the story; explains why you can't have a probability less than zero)

Snapshot – Consider alternatives

Critical and Creative Thinking: Generating: Consider alternatives

Content description

AC9M4P01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- consider alternatives and explore different or creative ways to approach a task or problem
- consider alternatives by comparing different or creative ways to approach a task, issue or problem and recommend a preferred option
- consider alternatives by challenging or creatively adjusting existing ideas in situations where current approaches do not work and recommend a preferred option

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4P01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
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- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Consider alternatives

Critical and Creative Thinking: Generating: Consider alternatives

Content description

AC9M4P01

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- consider alternatives by challenging or creatively adjusting existing ideas in situations where current approaches do not work and recommend a preferred option

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4P01

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- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4P01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Consider alternatives

Critical and Creative Thinking: Generating: Consider alternatives

Content description

AC9M4P01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

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- consider alternatives by comparing different or creative ways to approach a task, issue or problem and recommend a preferred option
- consider alternatives by challenging or creatively adjusting existing ideas in situations where current approaches do not work and recommend a preferred option

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4P01

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- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
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Snapshot – Consider alternatives

Critical and Creative Thinking: Generating: Consider alternatives

Content description

AC9M4P01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- consider alternatives and explore different or creative ways to approach a task or problem
- consider alternatives by comparing different or creative ways to approach a task, issue or problem and recommend a preferred option
- consider alternatives by challenging or creatively adjusting existing ideas in situations where

current approaches do not work and recommend a preferred option

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4P01

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

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- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

AC9M4P02

conduct repeated to observe relationships between outcomes; identify and describe the in results

-
-

Elaborations

- playing games such as Noughts and Crosses or First to 20 20 2 0 and deciding if it makes a difference who goes first and whether you can use a particular strategy to increase your chances of winning
- recording and ordering the outcomes of experiments using different physical or virtual random generators such as coins, dice and a variety of spinners, and discussing how AI systems use random generators to train
- experimenting with tossing 2 2 2 coins at the same time, recording and commenting on the chance of outcomes after a number of tosses
- shuffling a of cards, drawing a card at random, and recording whether it was a spade, club, diamond or heart, picture card or numbered; repeating the experiment a number of times and discussing the results

Students learn to:

conduct repeated chance experiments to observe relationships between outcomes; the variation in results

(AC9M4P02)

General capabilities and cross-curriculum priorities

This content description connects to the following general capabilities and cross-curriculum priorities.

Analysing

- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Statistics and probability

- Understanding chance

Elaborations

Content elaborations provide suggestions of ways to teach the content description and connect it to general capabilities and cross-curriculum priorities. Content elaborations are optional .

Analysing

- Interpret concepts and problems
- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Generating

- Put ideas into action

Statistics and probability

- Understanding chance

Analysing

- Draw conclusions and provide reasons

Inquiring

- Identify, process and evaluate information

Statistics and probability

- Interpreting and representing data

Analysing

- Draw conclusions and provide reasons

Generating

- Put ideas into action

Inquiring

- Identify, process and evaluate information

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4P02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4P02

Continuum extract

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- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
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Snapshot – Understanding chance

Numeracy: Statistics and probability: Understanding chance

Content description

AC9M4P02

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Comparing chance

- describes and orders the likelihood of events in non-quantitative terms such as certain, likely, highly likely, unlikely, impossible (e.g. "if there are more blue than red marbles in a bag, blue is more likely to be selected"; "I am certain that I won't win the competition because I didn't enter")
- records outcomes of chance experiments in tables and charts

- demonstrates that outcomes of chance experiments may differ from expected results (e.g. we will not get the same results every time we roll a dice)
- draws conclusions that recognise variation in results of chance experiments (e.g. you rolled a lot of sixes this game, I hope I get more sixes next time)

Fairness

- identifies all possible outcomes of one-step experiments and records outcomes in tables and charts
- explains why outcomes of chance experiments may differ from expected results (e.g. "just because there are 6 6 6 numbers on a dice doesn't mean you are going to roll a 6 6 6 every 6 6 6 rolls, you may not roll a 6 6 6 in the entire game")
- explains the difference between the notion of equal likelihood of possible outcomes and those that are not equally likely (e.g. explains the use of phrases such as fifty-fifty when there are 2 2 2 outcomes and when 2 2 2 events occurring are equally likely as opposed to head and tail are more likely than 2 2 2 heads or 2 2 2 tails)
- identifies unfair elements in games that affect the chances of winning (e.g. having an unequal number of turns; weighted dice)
- explains that the outcomes of chance events are either "certain to happen", "certain not to happen" or lie somewhere in between and knows that impossible events are events that are "certain not to happen"
- identifies events where the chance of one event occurring will not affect the occurrence of the other (e.g. if a coin is tossed and heads have come up 7 7 7 times in a row, it is still equally likely that the next toss will be either a head or a tail)

Probabilities

- expresses the theoretical probability of an event as the number of ways an event can happen out of the total number of possibilities
- identifies a range of chance events that have a probability from 0 – 1 0 – 1 0 – 1 (e.g. you have zero probability of rolling a 7 7 7 with one roll of a standard 6 6 6 -sided dice; the probability that tomorrow is Wednesday given today is Tuesday is one)
- describes probabilities as fractions of one (e.g. the probability of an even number when rolling a dice is $\frac{3}{6}$)
- expresses probabilities as fractions, decimals, percentages and ratios recognising that all probabilities lie on a measurement scale of zero to one (e.g. uses numerical representations such as 75 75 75 % chance of rain or 4 4 4 out 5 5 5 people liked the story; explains why you can't have a probability less than zero)

Snapshot – Interpret concepts and problems

Critical and Creative Thinking: Analysing: Interpret concepts and problems

Content description

AC9M4P02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify the main parts of a concept or problem and describe how these relate to each other
- identify and prioritise significant elements and relationships within a concept or problem
- identify the relevant and significant aspects of a concept or problem, understanding that approaches may change depending on the subject or learning area

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4P02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- draw conclusions and make choices when completing tasks and explain the reasons for choices made
- draw conclusions and make choices when completing tasks, using observation and prior knowledge to provide reasons and construct arguments for choices made
- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

AC9M4P02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- identify and explore relevant information from a range of sources, including visual information and digital sources
- identify and explain similarities and differences in selected information
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- condense and combine selected information related to the topic of study
- identify and examine relevant information and opinion from a range of sources, including visual information and digital sources
- compare information and opinion that can be verified against claims based on personal preference

Snapshot – Put ideas into action

Critical and Creative Thinking: Generating: Put ideas into action

Content description

AC9M4P02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

- put ideas into action by experimenting with options and predicting possible results
- put ideas into action by predicting an outcome, trialling options and assessing their effectiveness
- put ideas into action by predicting potential or future outcomes and systematically testing a range of options

Snapshot – Understanding chance

Numeracy: Statistics and probability: Understanding chance

Content description

AC9M4P02

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Comparing chance

- describes and orders the likelihood of events in non-quantitative terms such as certain, likely, highly likely, unlikely, impossible (e.g. "if there are more blue than red marbles in a bag, blue is more likely to be selected"; "I am certain that I won't win the competition because I didn't enter")
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not to happen"

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Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4P02

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The following continuum extract shows the alignment of the continuum with this content.

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- draw conclusions and make choices when completing tasks, using discipline knowledge to provide reasons and evaluate arguments for choices made

Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

Content description

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Snapshot – Interpreting and representing data

Numeracy: Statistics and probability: Interpreting and representing data

Content description

AC9M4P02

Learning progression extract

The following learning progression extract shows the alignment of the learning progression with this content.

Collecting, displaying and interpreting categorical data

- designs survey questions to collect categorical data (e.g. creates a suite of survey questions to plan the end of year class party)
- collects, records and displays one-variable data in variety of ways such as tables, charts, plots and graphs using the appropriate digital tools (e.g. uses a spreadsheet to record data collected in

a class survey and generates a column graph to display the results)

- displays and interprets categorical data in one-to-many data displays
- interprets and represents categorical data in simple displays such as bar and column graphs, pie charts, models, maps, colour wheels, and pictorial timelines, and makes simple inferences from such displays
- makes comparisons from categorical data displays using relative heights from a common baseline (e.g. compares the heights of the columns in a simple column graph to determine the tallest and recognises this as the most frequent response)

Collecting, displaying and interpreting numerical data

- collects and records discrete numerical data using an appropriate method for recording (e.g. uses a frequency table to record the experimental results for rolling a dice; records sample measurements taken during a science investigation)
- constructs graphical representations of numerical data and explains the difference between continuous and discrete data (e.g. explains that measurements such as length, mass and temperature are continuous data whereas a count such as the number of people in a queue is discrete)
- explains how data displays can be misleading (e.g. whether a scale should start at zero; not using uniform intervals on the axes)
- interprets visual representations of data displayed using a multi-unit scale, reading values between the marked units and describing any variation and trends in the data

Collecting, displaying, interpreting and analysing numerical data

- poses questions based on variations in continuous numerical data and chooses the appropriate method to collect and record data (e.g. collects information on the heights of buildings or daily temperatures, tabulates the results and represents these graphically; uses a survey to collect primary data or secondary data extracted from census data)
- uses numerical and graphical representations relevant to the purpose of the collection of the data and explains their reasoning (e.g. "I can't use a frequency histogram for categorical data because there is no numerical connection between the categories"; converts their data to percentages in order to compare the girls' results to those of the boys, as the total number of boys and girls who participated in the survey was different)
- determines and calculates the most appropriate statistic to describe the spread of data (e.g. when creating an infographic, uses the mean of the data to describe household income and the median of the data for house prices)
- calculates simple descriptive statistics such as mode, mean or median as measures to represent typical values of a distribution (e.g. describes the mean kilojoule intake and median hours of exercise of a sample population when investigating community health and wellbeing; describes central tendency when analysing road safety statistics)
- compares the usefulness of different representations of the same data (e.g. chooses to use a line graph to illustrate trends, a bar graph to compare the living standards of different economies and a histogram to show income distribution)
- describes the spread of a data distribution in terms of the range, clusters, skewness and symmetry of the graphical display, and determines and makes connections to the mode, median and mean of the data

Snapshot – Draw conclusions and provide reasons

Critical and Creative Thinking: Analysing: Draw conclusions and provide reasons

Content description

AC9M4P02

Continuum extract

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Snapshot – Put ideas into action

Critical and Creative Thinking: Generating: Put ideas into action

Content description

AC9M4P02

Continuum extract

The following continuum extract shows the alignment of the continuum with this content.

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Snapshot – Identify, process and evaluate information

Critical and Creative Thinking: Inquiring: Identify, process and evaluate information

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