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| **SCOPE AND SEQUENCE** | Mathematics — Years 1 to 9 | **MEASUREMENT** | **DRAFT** |
| **Scope and sequence** identifies what should be taught and what is important for students to have opportunities to learn. It describes the *knowledge* that students need for ongoing learning in Mathematics. This knowledge is presented as *Concepts and facts* and *Procedur*es.The scope and sequence:* is provided for each year of schooling
* should be used together with the *Essential Learnings*
* provides additional detail in each Organiser
* informs the focus of Mathematics in assessment
* is a key document for school curriculum planning.
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| **Prep** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** | **Year 7** | **Year 8** | **Year 9** |
| ***Concepts and facts*** | ***Concepts and facts*** | ***Concepts and facts*** | ***Concepts and facts*** | ***Concepts and facts*** | ***Concepts and facts*** | ***Concepts and facts*** | ***Concepts and facts*** | ***Concepts and facts*** | ***Concepts and facts*** |
| * Attributes of objects for measuring
* Familiar daily routines, activity and alternative sequences
* Familiar points in time
* Times of day
 | * Non-standard units:
	+ personal referents
* Ways to measure:
	+ length
	+ area
	+ volume,
	+ mass
	+ time
* Standards units:
	+ days and weeks
	+ o’clock times on 12-hour displays that link to familiar points in time of the day
* Points in time: start and finish time
* Duration of time
* Seasons
 | * Non-standard units
* Ways to measure with no gaps, overlaps or spillage when measuring
* Ways to measure:
	+ mass: hefting, measuring instruments
* Standard units:
	+ centimetre (cm)
	+ metre (m)
	+ kilogram (kg)
	+ litre (L)
	+ hour, half-hour on analogue clocks
	+ hour (h) minute (min)
	+ months of the year
	+ seasons of the year
* Sequence of events
* Duration of time in minutes
 | * Non-standard units
	+ square unit grids
* Standard units:
	+ year (yr)
	+ half and quarter of:

- metre (m), - kilogram (kg), - litres (L), - hour on analogue clocks* Ways to measure:
	+ area: rows
	+ volume: layers
* Duration of events
 | * Non-standard units:
	+ grids
	+ floor tiles
	+ paces
	+ hand spans
* Standard units:
	+ degree (º)
	+ metre (m) centimetre (cm)
	+ kilogram (kg), gram (g)
	+ litres (L), millilitre (mL)
	+ minute (min), second (sec)
	+ decade
	+ leap year
* Duration of time in seconds
* Timetables and schedules
* Ways to measure angles
 | * Non-standard units
* Standard units:
	+ degree (º)
	+ square metre (m2), square centimetre (cm2)
	+ metre(m), centimetre (cm)
	+ kilogram (kg), gram (g)
	+ litres (L), millilitre (mL)
	+ minute (min)
	+ century, decade
* Time conventions:
	+ ante meridiem (am)
	+ post meridiem (pm)
* Duration of time in minutes and seconds
* Timelines
 | * Standard units:
	+ millimetre (mm), kilometre (km)
	+ square metre (m2), square centimetre (cm2)
	+ cubic metre (m3), cubic centimetre (cm3)
	+ tonne (t), kilogram (kg)
	+ 12-hour, 24-hour time
* Rules for calculations of area, e.g. counting squares and part squares
* Duration of events: timetables
 | * Standard units**:**
	+ International System (SI) has seven base units
* Rules for perimeter, area and volume based on relationships between attributes of regular 2D (regular polygons, triangles, circles) and 3D objects (rectangular prism)
* Scale and gradations
* Error in measurements
* Australian time zones
* Australian daylight savings times
* Duration of time in fractions of a minute, or a second.
 | * Standard units:
	+ square kilometre (km2)
	+ hectare (ha)
* Formula for area, volume and perimeter for regular shapes
* Rate: familiar units in context, e.g. bananas $3 per kilogram
* Time zones and longitude
* Duration of events and time
 | * Standard units
* Formulas for volume of prism and area of parallelogram
* Accumulation of measurement errors
* Lengths and angles using:
	+ scale
	+ similarity
	+ trigonometry
	+ Pythagoras’ Theorem
* Rate: familiar context,e.g. water usage mL/hr, speed km/hr
* Duration of events and time
 |
| ***Procedures*** | ***Procedures*** | ***Procedures*** | ***Procedures*** | ***Procedures*** | ***Procedures*** | ***Procedures*** | ***Procedures*** | ***Procedures*** | ***Procedures*** |
| * Match
* Direct comparison of measurements
* Order and sequence
 | * Direct comparison
* Order and sequence
* Estimation
* Connection between:
	+ attribute and ways to measure it
	+ days and week
	+ sequence of daily events and o’clock
 | * Direct comparison
* Indirect comparison,e.g. measuring the first length with a piece of string then using the measured string and comparing it to the second length
* Order and sequence
* Estimation
* Connection between:
	+ half hour as a fraction of the hour
	+ hour and minutes
	+ minutes and 5-minute intervals
	+ days and months
	+ months, seasons and year
	+ sequence of events and times of the day
* Relationship between the size of the non-standard unit and the number required
 | * Direct comparison
* Indirect comparison
* Comparison between:
	+ personal referent and standard units
	+ whole, half and quarter of standard unit
* Order and sequence
* Estimation
* Connection between:
	+ days, weeks and a month and year
 | * Comparison
* Order
* Estimation using personal referents for all measures including for angles
* Scheduled sequences of events
* Connection between:
	+ seconds and a minute
* Links between smaller and larger standard units in length, area, volume, mass and time
* Links between analogue and digital time, e.g. 1:50 is the same as ten minutes to two
 | * Comparison
* Order
* Estimation
	+ stepping out
	+ grids
* Equivalence of measures of smaller units as larger units and vice versa, e.g. 600 mL/0.6 L, 1.5kg/1500 g
* Relationships between dimensions, e.g. area: length and width: volume, length, width and height
 | * Comparison
* Order
* Estimation of different standard units as referents
* Equivalent measures, e.g. 6 mm = 0.6 cm = 0.006 m
* Relationship between:
	+ length of side and perimeter
	+ length, width and area of rectangle
	+ perimeter and area
	+ kilograms and tonnes
	+ the larger the unit the fewer required to measure and vice versa
	+ units of measure, e.g. 75 minutes = 1¼ hours
 | * Comparison
* Order
* Estimation of reasonable value using scale
* Relationships between:
	+ Kilometre and metre
	+ centimetre and millimetre
	+ attributes of 2D and 3D shapes
	+ units of measure, e.g. 75 minutes = 1¼ hours
* Equivalence of measures of smaller units as larger units and vice versa, e.g. 2500 kg = 2.5 t
 | * Comparison
* Order
* Estimation
* Relationships between:
	+ hectare, square kilometre and square metre
	+ kilograms and tonnes
	+ perimeter and area of rectangle
	+ diameter and circumference of circle (pi)
	+ length, width and height, and volume of a prism
	+ length of side and perimeter of irregular or composite shapes
* Equivalent measures and conversions
 | * Comparison
* Order
* Estimation
* Relationships between:
	+ millilitres and cubic centimetres
	+ diameter, radius and area of a circle
	+ length and width (height), and areas of triangles and parallelograms
	+ areas of triangles and areas of rectangles
	+ areas of rectangles and areas of parallelograms (same length, same width or height)
* Equivalent measures and conversions, e.g. 4.5 hectares instead of 45 000 m2
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| * Concrete materials:
	+ computers
	+ manipulative materials
	+ analogue and digital clocks
* Verbal:
	+ everyday language: long/er, short/er, heavy/ier, light/er empty, full, lunchtime, going home time
* Visual:
	+ drawings of sequences in routines
	+ photographs of everyday objects and seasons
	+ calendars
 | * Concrete materials:
	+ computers
	+ manipulative materials
	+ calendars
	+ analogue and digital clocks
* Verbal:
	+ everyday language: long, covered, heavy, empty, slow, longer/shorter, heavier/lighter, later, earlier
* Written:
	+ o’clock analogue time
	+ days of week
	+ electronic
	+ sequence of daily events
* Visual:
	+ drawings
	+ analogue clock
	+ personal referent for different measures
 | * Concrete materials:
	+ computers and other electronic devices
	+ manipulative materials
	+ appropriate measuring instruments, e.g. metre ruler, trundle wheel, tape measure, balance, kitchen and bathroom scales, area grids, litre jugs
	+ calendars
	+ analogue and digital clocks
* Verbal:
	+ strategies for estimation and calculations
* Written:
	+ months and dates
	+ abbreviations for days
	+ simple plans for events
	+ class calendars
* Visual:
	+ analogue and digital clocks
	+ personal referent for different measures
 | * Concrete materials:
	+ computers and other electronic devices
	+ manipulative materials
	+ calendars
	+ analogue and digital clocks
* Verbal:
	+ digital and analogue times
	+ dates
	+ comparative language
	+ strategies for estimation and calculations
* Written:
	+ days and dates
	+ abbreviations for months, e.g. Jan and J
	+ digital representation of analogue time
	+ time in words, e.g. nine-thirty
	+ calendars
* Visual:
	+ analogue and digital clocks
	+ personal referent for different measures
 | * Concrete materials:
	+ computers and other electronic devices
	+ manipulative materials
	+ appropriate measuring instruments, e.g. stopwatch, 360º protractor
	+ calendars
	+ diaries
	+ analogue and digital clocks
* Verbal:
	+ strategies for estimation and calculations
	+ mathematical language: metric prefixes (milli-, centi-, kilo-)
* Written:
	+ conventions for recording measurements (timed events) and dates (including abbreviations)
	+ digital and analogue of the same time
* Visual:
	+ analogue and digital clocks
	+ calendar
	+ personal referent for different measures
 | * Concrete materials:
	+ computers and other electronic devices
	+ manipulative materials
	+ appropriate measuring instruments, e.g. 360ºprotractor
	+ train or bus timetables
	+ analogue and digital clocks
* Verbal:
	+ strategies for estimation and calculations to the nearest minute
* Written:
	+ decimal of measurements
	+ calculations of duration schedules
	+ timetables
	+ timelines
* Visual:
	+ analogue and digital clocks
	+ calendar
	+ personal referent for different measures
 | * Concrete materials:
	+ computers and other electronic devices (measuring instruments and technologies)
	+ manipulative materials
	+ appropriate measuring instruments for precision, e.g. 150 mL on a cup measure with 50 mL markings, 360º protractor
* Verbal:
	+ strategies for estimation and calculations
* Written:
	+ calculations of duration
* Visual:
	+ timetables
	+ personal referent for different measures
 | * Concrete materials:
	+ computers and other electronic devices (measuring instruments and technologies,e.g. speedometer)
	+ manipulative materials
	+ appropriate measuring instruments for precision
* Verbal:
	+ strategies for estimation and calculations
	+ mathematical language: diameter, circumference, base of triangles and prisms
* Written:
	+ diary entries
	+ timetables
	+ timelines
	+ calculations between and within 12-hour and 24-hour times
* Visual:
	+ timetables
	+ personal referent for different measures
 | * Concrete materials:
	+ computers and other electronic devices (measuring instruments and technologies)
	+ manipulative materials
* Verbal:
	+ strategies for estimation and calculations
	+ mathematical language: radius, pi
* Written:
	+ time calculations
* Visual:
	+ personal referent for different measures
 | * Concrete materials:
	+ computers and other electronic devices (measuring instruments and technologies)
	+ manipulative materials
* Verbal:
	+ strategies for estimation and calculations
	+ mathematical language: opposite, adjacent, hypotenuse, Pythagoras’ Theorem, tangent, Eastern Standard Time (EST), Central Standard Time (CST), Western Standard Time (WST), daylight saving time
* Written:
	+ calculations of measurement
	+ calculations Australian time zone differences
* Visual:
	+ personal referent for different measures
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