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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. | | | | | | | | | | | | |
| **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 |
| * 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 |