|  |  |  |
| --- | --- | --- |
| Strand: Measurement | | Topic: Time |
| Foundation Level: Level statement  Students are responding to and developing some everyday language associated with time, length, mass, area and volume. | | |
| Example learning outcome  Students associate everyday language related to time to familiar events, times of the day or week. | | |
| Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically | | |
| Students know:   * everyday language that relates to time. | Students may:  respond to a range of routine commands (e.g. ‘next’, ‘after’, ‘before’, ‘later’, ‘not now’, ‘start’, ‘finish’)  participate in games, familiar activities or routines that require a response to directions involving time (e.g. stop, wait, next)  use common language related to time in life situations (e.g. go to school in the morning, stay home at the weekend, go to bed at night)  respond ‘yes’ or ‘no’ to ideas about time  respond to notions of time related to ‘wait’, ‘soon’, ‘not now’ for anticipated events (e.g. swimming is soon, wait for bus or taxi)  respond to notions of time related to the commencement of events (e.g. ‘now’, ‘it’s time’, ‘let’s go’, ‘ready, set, go’)  respond to language related to the duration of events (e.g. ‘one more’, ‘keep going’, ‘nearly finished’)  respond to notions of duration of time when using equipment, such as manual or electronic timers (e.g. for cooking or timing events)  respond to language related to the completion of an event (e.g. ‘finished’, ‘all over’, ‘no more’, ‘stop’)  participate in developing a sequence for familiar daily routines (e.g. swimming, therapy programs, shopping, community-based activities, morning tea or lunch routine, getting a taxi, arriving home, getting dressed) using photographs, drawings or iconic schedules  respond to signals that indicate changes in routines, or commencement or completion of familiar events (e.g. the bell for the finish of work, start of lunch time; a siren for a fire drill; an alarm clock for finishing sleeping)  recognise several parts of a familiar sequence as belonging to a significant familiar event (e.g. setting the table as part of the lunch routine)  recognise significant changes in familiar routines or situations — such as night and day, going to school, going home — through a range of sensory observations  show an awareness of the names of the days of the week  associate ‘yesterday’ as a connection to past events  associate ‘tomorrow’ as a connection to future events  associate clocks and watches with telling the time  identify specific, routine events on particular days using visuo-graphic prompts on timetables or calendars  participate in, or contribute to, roleplays, songs and games involving ideas related to time  show an awareness of duration when participating in routine events, such as shopping or commuting (e.g. go to shop, choose items, pay for items, leave shop; get ready, go to the bus stop, wait for and catch a bus)  participate in, notice or recognise the predictability of sequences of events in a range of environments (e.g. toileting at home, at school and in the community)  show an awareness of different durations in a working day (e.g. work — morning tea; work — lunch; work — home). | |

|  |  |  |
| --- | --- | --- |
| Level 1: Level statement  Students identify and distinguish between the attributes of length, mass, area and volume. They select an attribute to make comparisons between objects. They describe these comparisons using appropriate language. They use non-standard units when they estimate and measure length, mass, area and volume.  Students are developing an awareness of time and its relevance to their everyday lives. They sequence familiar events and relate specific events to days of the week and months of the year. They use comparative language to describe the duration of events or activities. | | |
| Core learning outcome M 1.2  Students sequence familiar events related to days and weeks, and directly compare the duration of events. | | |
| **Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically** | | **Core content** |
| Students know:  names and sequence of days in a week  events can be sequenced within a day and across a week  how to sequence familiar events  duration of an event is measured from the start time to the finish time  how to directly compare the duration of events. | Students may:  use language related to particular points in time  identify whether an event occurred before (earlier or in the past) or after (later) a designated point in time  identify the different points in a time sequence and give reasons for decisions  order events in a sequence according to time and give reasons  identify the relationship between days and weeks  represent the occurrence of events on weekly class calendars and identify the months within which these occur  suggest reasons for the placement of events on calendars  informally identify the duration between familiar events using non-standard units (e.g. number of sleeps)  identify durations as being the time between the start and finish  describe durations using comparative language  relate ideas about duration to other familiar events that take more time or less time. | Units and conventions  non-standard units  units   * days, weeks, months   comparative language (e.g. later, earlier, more time, less time)  class calendars  Relationships  points in time (e.g. home time,  start time)  times of day (e.g. morning)  days and a week  duration   * time between start and finish |
| Investigations should occur in a range of contexts. For example, students could investigate:  daily routines, such as getting ready for school  sequences related to past experiences, such as a holiday or a trip  the duration of various activities, such as lunch time, morning tea time, music lessons. | | |

|  |  |  |
| --- | --- | --- |
| Level 2: Level statement  Students use non-standard and some standard units to estimate, measure and order length, mass, area and volume. They understand that the larger the unit, the fewer required to measure an object, and that standard units provide consistency when measuring.  Students measure and compare durations of events and link these to familiar activities. They read hour and half-hour displays on analogue clocks and any time on digital displays. They use calendars to locate and sequence events that are of significance to them over a year. | | |
| Core learning outcome: M 2.2  Students use a calendar to locate and sequence events, read and interpret key times on 12-hour displays, and measure and compare durations of time. | | |
| Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically | | **Core content** |
| Students know:  conventions for, and purposes of, calendars  how to read a calendar to locate events  how to sequence events by time  units of time  ways of measuring and comparing durations  12-hour displays represent the points in time and the passing of time  structure of a 12-hour display  how to read and interpret key times on analogue displays  relationships between different units of time. | Students may:  explain the purposes of monthly and yearly calendars  list possible uses for calendars  identify the time units used within calendars and explain the relationships between these  identify significant reference points on a calendar (e.g. the digits that denote the year)  explain the use of numbers on the calendar (selection, positioning and pattern on the calendar grid) and the relationship between the numbers on the calendar and the days and dates  interpret abbreviations to identify and describe the day and date of events  locate dates of recurring meaningful events (e.g. weekly music lessons, fortnightly shopping trips)  list or represent events, such as personal sequences of events, for a particular week or month in different ways  identify and describe different displays of time  identify and describe the movement of the hands of a clock and how each hand assists in reading time  explain 5-minute intervals used on analogue clocks  explain the relationship between the use of 12-hour displays on analogue clocks and 24 hours in a day  read and represent ‘o’clock’ and ‘half past’ on analogue clocks  read and record digital time as it relates to daily events  match and represent o’clock and half past on analogue and digital clocks  identify and interpret common and colloquial expressions related to time (e.g. ‘be there in a sec’)  explain the need for, and use of, larger and smaller units of time  monitor the passing of time using a range of instruments and describe the relationship between representations on instruments and the units of time  estimate, measure and record time using small standard units  compare and classify the duration of events as being ‘more than’, ‘less than’, or ‘about the same as’ an identified standard unit or multiples of small standard units (e.g. 1 minute or 5 minutes)  develop referents for a range of standard units and give reasons for choices. | Units and conventions  units   * seconds (s) * minutes (min) * hours (h)   + half hour, quarter hour * years (yr)   12-hour displays   * analogue (o’clock, half hour,  5-minute interval markings) * digital (all times)   seasons  calendars   * abbreviations for days (e.g. Mon) * months in words   representations (e.g. 9:30,  nine-thirty)  Relationships  days and months  weeks and a year  months and a year  analogue and digital displays  duration   * estimation of seconds, minutes |
| Investigations should occur in a range of contexts. For example, students could investigate:  the use of calendars in historical and current contexts  the construction of calendars to show recurring and incidental school and class events and celebrations over a month or a year  the design of calendars to show weather or sports seasons  contemporary and historical clocks, such as water clocks, sun dials, digital clocks  durations of events or tasks. | | |

|  |  |  |
| --- | --- | --- |
| Level 3: Level statement  Students use equivalent forms of standard units to compare, order and measure. They select appropriate standard units to estimate and measure length, mass, area and volume. They further develop their estimation skills by identifying and using a set of personal measurement referents.  Students interpret and use calendars, simple timetables and diaries to plan and record events in their daily lives. They know and use conventions related to reading and recording time.  They calculate the duration of events. | | |
| Core learning outcome: M 3.2  Students read, record and calculate with 12-hour time, and interpret calendars and simple timetables related to daily activities. | | |
| **Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically** | | **Core content** |
| Students know:  how 12-hour time relates to analogue and digital clocks  how to read digital and analogue representations of 12-hour time  conventions for recording  12-hour analogue and  digital time  relationships between different units of time  mental computation strategies and computation methods for calculating time  conventions for, and purposes of, calendars  conventions for, and purposes of, simple timetables and timelines for daily activities  how to interpret simple timetables and timelines for daily activities. | Students may:  explain the use of a.m. and p.m. as it relates to 12-hour time and the relationship between hours and days  read and interpret different time displays, such as those on digital and analogue clocks, on electronic equipment (e.g. microwave ovens), and in printed program guides timetables and appointment diaries  identify and describe the relationships between minutes and an hour, seconds and a minute, and fractions of hours  record time using conventions (e.g. 9:30)  estimate durations of second(s), minute(s) and half hour using personal referents  measure and calculate short durations in seconds, minutes and hours using relationships between units  of time  record sequences of activities using 12-hour time  explain the purposes of calendars, timetables and timelines  use patterns within a calendar grid, units of time (e.g. a fortnight), and abbreviations to locate days and dates within and across months  identify and describe the characteristics of a leap year  interpret timetables to determine the order of activities (e.g. library lessons, lunch time)  record days, dates and times for specific events on a calendar or timetable. | Units and conventions  units   * fortnight * leap year   12-hour displays (analogue and digital)   * quarter past, quarter to * five-minute intervals   timelines  timetables (e.g. school, bus, train)  diaries (e.g. personal, school, class)  calendars   * abbreviations for days  (e.g. M for Monday), months  (e.g. Feb for February)   conventions   * dates (e.g. dd/mm/yy) * ante meridiem (a.m.) * post meridiem (p.m.)   Relationships  digital and analogue time  seconds and a minute  minutes and an hour  minutes and parts of hours  (quarter, half)  hours and days  duration  personal referent (for seconds, minutes, half hour) |
| Investigations should occur in a range of contexts. For example, students could investigate:  the scheduling and duration of television programs to plan viewing  travel times for different modes of transport  tide times to plan a surfing or fishing excursion  a timetable for daily activities at a school camp. | | |

|  |  |  |
| --- | --- | --- |
| Level 4: Level statement  Students investigate ways to determine areas, volumes and lengths of boundaries and describe the relationships between the dimensions in general terms. They select and use the appropriate standard units when estimating and measuring.  Students use personal timetables, diaries, timelines and calendars to plan and organise events or activities of significance to them. They use 24-hour and 12-hour time. | | |
| Core learning outcome: M 4.2  Students read, record and calculate with 24-hour time and develop timetables and calendars to plan and organise events or activities. | | |
| **Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically** | | **Core content** |
| Students know:  how 12-hour time relates to  24-hour time  how to read digital and analogue representations of 24-hour time  conventions for recording  24-hour time  mental computation strategies and computation methods for calculating with 24-hour time  how to make durations of time manageable for calculations  how to develop timetables and calendars  how to plan and organise events or activities using calendars and timetables. | Students may:  interpret timetables and match 12-hour representations to 24-hour time (e.g. 5:30 a.m. written as 0530 or 5:55 p.m. written as 1755)  explain the relationship between ante meridiem (a.m.), post meridiem (p.m.) and 24-hour times  estimate and calculate the duration of events involving combinations of hours and minutes renaming mixed units as required (e.g. 2 h 35 min = 155 min)  estimate and calculate duration of events renaming mixed units as required  identify and explain factors impacting on a travel plan (e.g. transition times)  record start and finish times electronically or manually using 24-hour time  show the relationships between different time units (days, weeks and months, years, decades and centuries)  use conventions for ease of interpretation  create a timeline taking into account scale and proportion  use a calendar to communicate forthcoming or past events in days, weeks and months, and to identify start and finish dates of particular programs  use a timetable or timeline to communicate past or future events. | Units and conventions  units   * decade * century (e.g. 21st century is 2001-2100)   24-hour time  personal timetables, diaries (electronic or manual)  timelines  calendars  Relationships  days, weeks, months and years  hour and minutes (e.g. 90 minutes = 1½ hours)  decade and century  24-hour time and 12-hour time  duration   * time calculations |
| **Investigations should occur in a range of contexts. For example, students could investigate:**  a program for a school camp  planning a class project over a term or semester with a culminating event  pictorial representations of timelines related to historical explorations or discoveries  various ways in which time is measured and recorded by different professions or occupations. | | |

|  |  |  |
| --- | --- | --- |
| Level 5: Level statement  Students identify and describe links between their own generalised methods and formulae used to calculate areas, volumes and lengths of boundaries.  Students solve realistic time-management problems and plan and manage use of time. They understand and consider the impact of different time zones within Australia. | | |
| Core learning outcome: M 5.2  Students interpret and solve realistic problems related to time management and time zones within Australia. | | |
| **Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically** | | **Core content** |
| Students know:  time zones within Australia  different ways to manage time  factors impacting on time management  how to identify, interpret and solve realistic problems involving time management  how to identify, interpret and solve realistic problems involving time zones within Australia | Students may:  interpret problems related to time zones and time management  identify the different time zones within Australia and explain reasons for these differences  estimate and calculate time differences between various locations  record duration of time using various representations of time units  identify factors that impact on time management, such as the length of tasks, meal times, time required for travel and transfer  calculate time usage and record timetables of more than one-week duration using various representations of time units  modify timetables to make optimal use of time and give reasons for decisions with reference to time zones, including daylight saving times  interpret and explain decimal representations of time units  justify decisions related to time management. | Units and conventions  Australian time zones   * Eastern Standard Time (EST) * Central Standard Time (CST) * Western Standard Time (WST) * daylight saving time   timetables  Relationships  decimal representations of time units (e.g. 2.25 hours = 2 hours  15 minutes)  duration   * time calculations   timetables of more than one week duration |
| Investigations should occur in a range of contexts. For example, students could investigate:  a range of local and national timetables, both electronic and print, to develop travel or communication plans  advertised contract plans taking into account time available, rate of usage and factors impacting on usage, such as budget, time and number of users  the impact of different time zones within Australia on business, health or personal situations  personal time management. | | |

|  |  |  |
| --- | --- | --- |
| Level 6: Level statement  Students explore and explain relationships within triangles. They select and use formulae to solve problems related to area, volume and length.  Students use a variety of timetables to plan, monitor, manage and record the use of time. They justify their decisions by identifying implications and consequences. They understand and consider the impact of different time zones within the world. | | |
| Core learning outcome: M 6.2\*  Students analyse and use a variety of timetables to justify time management decisions, and interpret and solve realistic problems involving international time zones. | | |
| **Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically** | | **Core content** |
| Students know:  how to analyse and use a variety of timetables  how to justify time management decisions  international time zones  how to identify, interpret and solve realistic problems involving international time zones  relationships between time zones and longitude. | Students may:  analyse timetables in relation to time management issues  access and analyse a range of relevant timetables both electronic and print  calculate time usage and record timetables using appropriate time units  allocate additional time in response to factors that influence time management decisions  justify decisions related to time management  compare international times with Australian time zones to synchronise global events  explain that 15º of longitude equates to one hour of time difference across the surface of the earth  estimate and calculate time differences between different locations | Units and conventions  international time zones   * Greenwich Mean Time (GMT)  or Universal Time Coordinates (UTC) * International Date Line   timetables  Relationships  time zones and longitude  synchronisation of events  duration   * time calculations |
| **Investigations should occur in a range of contexts. For example, students could investigate:**   * international travel itineraries * global communication link-ups * schedules for television coverage of live overseas events * personal time management. | | |

\* This outcome may be demonstrated in association with S 6.2