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| Strand: Space | Topic: Location, direction and movement |
| Foundation Level: Level statementStudents are developing notions of shape, location, direction and movement. |
| Example learning outcomesStudents position or locate objects in response to directions.Students use an awareness of locations to follow the directions for daily routines.Students recognise familiar places when approaching from different directions. |
| Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically |
| Students know: a range of different actions to respond to everyday language for movement signs require different movement responsesfamiliar locations from different viewpoints and approaches. | Students may:follow directions and/or cues, such as up, down, to, from, on, under, open, shut, in, out, off, on top of, upside down, in a range of familiar contexts (e.g. get communication book in or out of bag, get in or out of the car, place book on the table, turn lights on or off, open or shut eyes, open or shut a cupboard, move the joystick on an electric wheelchair) follow practised routines relevant to different aspects of their lives (e.g. travelling to school, community centre, leisure activities)respond to prompts to use objects the ‘right way up’ (e.g. hold the puzzle piece with the picture on top, hold a bag the right way up to open it, hold a cup or jug the right way to hold liquid)recognise signs that identify movement, pathways and locations (e.g. signs for exit, push or pull; icons for no entry, walk or don’t walk, toilet; positional or directional arrows in public places)recognise familiar locations from different viewpoints (e.g. approaching a picnic table from the car park or the toilet block; approaching the classroom from the main entrance, playground or toilet block)participate in action songs or rhymes that require signs, gestures or tactile promptsparticipate in obstacle courses that involve finding locations and exploring movementsfollow pathways involving turns (e.g. cars in tracks, follow the leader, negotiate a bike path) follow set pathways around familiar environments (e.g. shopping centres, the school, the classroom)plan pathways involving turns (e.g. pushing objects through sand, travelling from the classroom to the toilet)position items for specific purposes (e.g. storing equipment, setting a table, placing items in a refrigerator, locating and using the cursor on a computer screen).  |

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| Level 1: Level statementStudents identify some obvious properties that distinguish 3D shapes and objects and 2D shapes, and understand that these properties are constant. They describe properties using simple geometric terms and construct representations of shapes, paying attention to the number of sides or corners and the shapes of faces.Students identify and describe locations and the positions of objects relative to known landmarks within familiar environments. They give directions that guide others through those environments, follow directions to move between one location and another and identify alternative pathways between locations. |
| Core learning outcome: S 1.2Students follow and give simple directions to move through familiar environments and locate and place objects in those environments. |
| **Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically** | **Core content** |
| Students know:language associated with location, direction and movementhow to use the language associated with location, direction and movement to give directions for moving through, and for locating and placing objects in, familiar environmentshow to interpret the language associated with location, direction and movement to follow directions to move through, and to locate and place objects in, familiar environments. | Students may:identify and list words that are used to describe position and movement identify frequently visited locations and describe them in relation to other known locations (e.g. the toilets are near the library)identify a variety of pathways to and from frequently visited locationsidentify and list the key components of directions (e.g. starting points, finishing points, changes of direction, possible pathways)use everyday language to give directions make ‘mind pictures’ of, and describe, possible pathways to and from known locationsfollow and give directions to different locations from the same starting pointfollow and give directions to the same location from different starting pointsplace an object in the classroom or school ground and give directions to their peers to locate itfollow others’ directions to locate an object in the classroom or school ground monitor responses to directions they give and adjust as necessarycombine gestures with the language of location, direction and movement as requiredgive reasons for the language selected and the style (verbal or non-verbal) used to give directionsinterpret positional signs (text or arrows) as requiredsuggest alternative, safe pathways to the same location using the language associated with position, location, direction and movementcompare the similarities and differences in the language and type of directions needed for different purposes (e.g. the number of steps in a treasure hunt)change directions when travelling (e.g. when turning, indicate directional change with gestures)use ‘mind pictures’ to visualise pathways for locating or placing objectsevaluate the ease with which directions could be followed, and the appropriateness of the directions for different people; modify directions as necessary. | Location and movementlanguage* position (on, between, beside, near, before, after …)
* direction (over, under, up, down, left, right … )
* movement (forwards, backwards, sideways …)
* non-verbal
	+ signs, symbols (static)
	+ gestures (dynamic)

‘mind pictures’ of familiar pathwaysalternative pathwaysDirection and anglelanguage* turns (change in direction)
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| Investigations should occur in a range of contexts. For example, students could investigate:possible pathways within the classroom, school campus or local venuesdesigns for a class or school mural with images and objects placed in different positionspossible routes through obstacle courses they have developedthe location of ‘treasures’ by following treasure maps.  |

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| Level 2: Level statementStudents sort 3D shapes and objects by identifying common properties, including those that distinguish them from 2D shapes. They identify and match drawings, pictures and other representations of 3D shapes and objects from different viewpoints and orientations. They investigate nets of some shapes by unfolding and refolding packages.Students recognise that maps and plans are representations of environments and use these to follow or give directions related to pathways and the location of objects. They interpret and use alphanumeric grids to describe locations. They create simple sketches that represent parts of familiar environments and recognise the relative size and proximity of objects and locations. |
| Core learning outcome: S 2.2Students interpret and create simple maps, plans and grids to follow and give directions, and to locate or arrange places or objects. |
| **Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically** | **Core content** |
| Students know:maps, plans and grids are representations of aspects of the environmenthow to arrange places or objects to create simple maps, plans and grids how to interpret simple maps, plans and grids to locate places or objectslanguage associated with location, direction and movementhow to use the language of location, direction and movement to give directions and to locate or arrange places or objectshow to interpret the language of location, direction and movement to follow directions and to locate or arrange places or objects. | Students may:identify and list language that could be used to give directions or to locate or arrange places and objectsgive and follow directions to familiar places in the school environment (e.g. library, tuckshop)give reasons for the choice of language used to describe movements and directionsdetermine the view to be represented when using a simple map, plan or grid to give directions, or to locate or arrange places or objectscreate simple maps, plans and gridsidentify different ways to represent movement on maps, plans and gridsprovide representations of pathways on maps, plans or grids for others to followmodify representations of pathways using feedback from others and evaluate effectiveness of changes visualise and follow described pathways evaluate the ease of interpreting directions given by peersidentify what happens when directions are changed to include different amounts of turn or when turns are rotated when locating objects or places (e.g. clockwise instead of anticlockwise, moved right instead of left)visualise and create representations of alternative pathways to the same locationidentify and locate key features (e.g. fire hydrants, doorways) on maps to assist interpretation arrange places or objects on maps, plans or grids in response to directionscompare and make judgments about the relative sizes of objects, proximity to other objects and distances involved when locating or arranging places or objects on maps, plans or grids arrange icons to represent specific objects or locations and decide whether icons assist interpretationslist and arrange possible icons for directions, such as quarter or three-quarter clockwise turns, that enhance interpretation of movement using a gridcheck that others interpret the map as intended and make modifications as necessaryrepresent different viewpoints and check the interpretations of othersinterpret and follow maps, plans and grids developed by others that use different viewpoints identify the intended purpose for the representation. | Location and movementsimple mapssketches of simple plans (e.g. rooms)relative size of objects and locationsnon-labelled grids alphanumeric grids (e.g. B3)movement (e.g. paces, steps, grid spaces)different viewpoints (above, ‘bird’s- eye view’, front, behind, side)alternative pathways Direction and anglelanguage* full, half, quarter and three-quarter turns
* left and right turns
* clockwise, anticlockwise
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|  Investigations should occur in a range of contexts. For example, students could investigate:diagrammatic representations of gymnastic, dance or march routines for a group performancerepresentations of pathways for school activities, such as fun runs or treasure huntsrepresentations of journeys made by fictional characters, such as the Gingerbread Man or Shreka visitors’ guide for the school art show or fete.  |

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| Level 3: Level statement Students identify and visualise the geometric properties that define and distinguish families of prisms, cylinders, spheres, cones and pyramids. They recognise and describe the properties that distinguish trapeziums and rhombuses from other quadrilaterals, as well as the properties that distinguish different groups of triangles. They describe the properties of shapes using terms such as parallel, congruent, symmetrical and other terms related to angles. They draw shapes using various conventions to indicate particular geometric properties. Students describe locations and directions with reference to the four compass points and grid references displayed on simple, authentic maps and plans. They interpret the symbols used on maps by referring to the keys and legends and know that most maps are orientated to the north. |
| Core learning outcome: S 3.2Students interpret and create maps and plans using a range of conventions, describe locations and give directions using major compass points, angles and grids. |
| **Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically** | **Core content** |
| Students know:conventions for maps, plans and gridshow to use conventions to create maps and plans how to use conventions to interpret maps and plansthe four major compass pointsthe relationship between the amount of turn and the change in directionhow to describe locations using major compass points, angles and gridshow to give directions using major compass points, angles and grids. | Students may:describe the purposes of conventions for maps and plansidentify and interpret conventions on maps and plans and use these to describe locations or give directionsuse grid references for regions (squares) or points (exact location) and major compass points to locate places of interest on maps and plansvisualise, follow and give directions to places of interest or importanceprovide directions for alternative pathways to specific locations when approaching those locations from different major compass pointsidentify and give directions to places close to specified locations by referring to compass points and angles to identify changes in direction and amount of turncreate maps and plans for particular purposes using conventions and give reasons for choicesevaluate the use of different conventions when maps are interpreted and used. | Location and movementcombinations of alphanumeric grids and maps (e.g. local area)plans (e.g. school layout)conventions* keys and legends (symbols and explanations of the symbols)
* grid references (regions and/or points)
* orientation to north

Direction and anglethe four compass points (N, S, E, W)connection between compass points and the amount of turn  |
| Investigations should occur in a range of contexts. For example, students could investigate:the creation of maps to assist the emergency evacuation of their home or schoolstreet maps of their local area to plan routes for fun runs or walkathonsthe location of speciality shops and amenities in shopping centres the design of tourist maps for visitors to their local area. |

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| Level 4: Level statementStudents analyse the geometric properties that define and distinguish families of polygons and their subgroups. They analyse and describe groups of 3D shapes, such as the Platonic solids. They use the properties of prisms and pyramids to identify other shapes belonging to those groups. They analyse and classify shapes according to criteria including rotational symmetry and perpendicular lines or faces, and measure angles in degrees using protractors.Students interpret maps of the world, describing the location of the equator and other key lines of reference. They describe how the lines of latitude and longitude relate to the equator and the poles. They refer to the eight compass points or angle of turn when giving directions. They use simple linear scales to estimate distance on maps and plans. |
| Core learning outcome: S 4.2Students interpret maps and plans with reference to conventions including latitude and longitude for maps, and describe movements using compass points and distance. |
| **Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically** | **Core content** |
| Students know:conventions for maps and plansscale proportionally enlarges or reduces measurementslines of latitude and longitude which are key lines of reference how to interpret maps and plans with reference to conventionsthe eight major compass points the relationship between the amount of turn and the change in directionhow to describe movements using compass points and distance. | Students may:locate and identify key lines of reference describe the purpose of key lines of referencecompare various locations relative to key latitudes and longitudes (e.g. Brisbane is south of the Equator and east of Greenwich)use conventions, including scale and coordinates, to find locations and describe pathwaysuse simple scale to determine the relative distances between points describe movements between locations using distance and compass points, angle as a difference in direction (e.g. East/South is 90°), estimates of turn in degrees (Facing north, turn 45° to face north-west), follow directions involving conventions, direction and angle.  | Location and movementconventions* simple scale on maps (linear form or 1 cm:1 km)
* coordinates
	+ grid references
	+ movement between grid reference points
* latitude and longitude
	+ key lines of reference (prime meridian, equator)
	+ polar limits

maps* flat maps
* globes

plans (e.g. shopping centre)Direction and angleeight compass points (N, NE, E, SE, S, SW, W, NW)connection between the eight compass points and the amount of turnangle as a difference in directionestimation and measurement of angles in degrees |
| Investigations should occur in a range of contexts. For example, students could investigate:climatic zones and geographical regionsalternative pathways around venues such as amusement parks camping areas suitable for accommodating a large group for an extended period of time (e.g. orientation of camp sites, distance to amenities and activity areas)maps for treasure hunts for use at school fairs or fetessimple orienteering courses, such as ‘Hunt the coin’.  |

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| Level 5: Level statementStudents investigate the properties of shapes, including congruence and similarity, and identify shapes embedded within irregular shapes to assist with the calculation of areas. They interpret and draw plans and elevations with attention to suitable scales, depth and perspective, and use geometric tools to assist with the construction of shapes and angles.Students use the conventions of mapping, including latitude and longitude, to interpret and describe movements and locations on maps of the world. They calculate distance on maps and dimensions on plans by referring to scales expressed as simple ratios. They give or follow directions expressed as compass bearings and distance to move around a local environment. |
| Core learning outcome: S 5.2Students interpret maps and globes referring to latitude and longitude, interpret and describe plans that use scale and describe movements using compass bearings and distance. |
| **Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically** | **Core content** |
| Students know:latitude indicates position north or south of the 0° latitude (the equator)longitude indicates position east or west of 0° longitude (Greenwich) measured along the equatorhow to interpret maps and globes using latitude and longitudehow to interpret scale on maps and planshow to describe movements using compass bearings and distance. | Students may:read latitude and longitude in whole degrees on maps and globesuse conventions to find locations on maps and apply scale to calculate distancesrepresent locations using conventions use compass bearings to describe directions of travel use scale to interpret planscalculate the actual distances and sizes represented on plansidentify the orientation of maps and plansdescribe locations of various features on maps.  | Location and movementconventions* scale on maps expressed as a simple ratio (e.g. 1:10; 1:1000 )
* coordinates
	+ latitude and longitude expressed in whole degrees
	+ location of points and places using latitude and longitude
* distance and bearing (local environment)

maps* flat maps including world, atlas, street directory, and orthophoto
* globes

simple floor plans with scaleDirection and anglebearings in whole degrees (measured clockwise from north)estimation of bearings in degreesapplication of scales to maps to find actual distances |
| **Investigations should occur in a range of contexts. For example, students could investigate:** orienteering courses in local parks or recreation areasitineraries for road trips within Australia considering the location of points of interest, time available and distance to be travelledconstruction or environmental plansair routes within Australia. |

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| Level 6: Level statementStudents make generalisations about shapes, lines and angles and develop chains of reasoning connecting related properties that can be used to solve geometric problems. They communicate their solutions by using geometric terms and symbols supported by appropriate representations.Students analyse a range of authentic maps, globes and plans, identifying the information that guides interpretation. They understand why time varies across the world, and refer to international time zones, rotation of the Earth, and position on the Earth’s surface to explain or calculate dates and times in specific places. |
| Core learning outcome: S 6.2Students interpret maps and plans using standard conventions, provide directions based on bearings and distance, and use longitude to explain time differences between major locations. |
| **Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically** | **Core content** |
| Students know:the standard conventions used on maps and planshow to interpret maps and plans using standard conventionshow to give directions based on bearings and distancethe relationship between lines of longitude and time differences.  | Students may:use scale to interpret plansexplain the relationship between whole degrees and minutes of arcuse scale to enlarge or reduce shapes within plans or regions within mapsdraw plans using conventions and identify the orientation apply scale to calculate distances represented on maps or measurements on plansinterpret maps and globes using latitude and longitude in whole and fractions of degrees to identify locations and travel pathwaysprovide directions based on compass bearings and distanceidentify key referents for international time zonesexplain time differences between worldwide locations based on changes in longitude.  | Location and movementconventions* scale on maps expressed as ratio (e.g. 1:25; 1:40)
* coordinates
	+ fractions of degrees expressed as minutes (mentally and on scientific calculators)
	+ latitude and longitude expressed in degrees and minutes
* scale on floor plans expressed in millimetres

key referents for international time zones* Greenwich Mean Time (GMT) or Universal Time Coordinates (UTC)
* International Date Line

link between longitude and timedistance and bearingDirection and anglemaps (local environment) with a given scalenavigational instructions based on distance and bearings (using protractors) |
| **Investigations should occur in a range of contexts. For example, students could investigate:**suitability of a specific site for a given construction or environmental planplans for Do It Yourself projects travel itineraries for around the world adventuresglobal positioning devicessimulated nautical navigation for trips in the local areapossible courses for orienteering on mountain bike or foot. |