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| Strand: Number | Topic: Number concepts |
| Foundation Level: Level statementStudents are developing a notion of counting and an awareness of number and money. Number names are becoming more meaningful.  |
| Example learning outcomesStudents rote count to a specified number (e.g. 3, 5).Students recognise numerals in their lives and environments.Students recognise money in various forms. |
| Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically |
| Students know:counting uses numbersnumbers are usefuleveryday language can represent quantities numerals match quantitiesthe language of part/whole (e.g. some, a piece of, all)money is used as exchange for goods and servicesmoney can have different forms — notes and coins, cash cardseveryday language that relates to the use of money. | Students may:rote count forwards in various stages (e.g. to 5, 10 or 20) in familiar situations, such as finger play, songs, games, play, routines recognise significant numbers (e.g. date of birth, age, house number, television channels, bus numbers) point to numerals in and around the classroom (e.g. on the clock face, on posters, on identification tags on school bags)recognise numbers that have communicative purposes (e.g. personal identification numbers (PINs), emergency and family phone numbers, numbers for automatic dialling)use everyday words, such as ‘lots of’, ‘heaps’ and ‘none’, to represent collections of familiar objectsdistinguish numerals from lettersmatch small collections of objects to representations of numbers including calculator and electronic representationsmatch numerals and hand representations of small quantities to the same value of concrete objects (e.g. numeral 1 to one piece of fruit, show two fingers or two hands to indicate the number of sandwiches to eat, numeral 2 to two counters)match a numeral to pictures of a small number of objects (e.g. numeral 1 to a picture of one item)recognise that numbers have a use (e.g. for identifying buses and houses, and for using in dates and games)recognise that counting has a use (e.g. for checking the number of items in a container, sharing collections, providing a sequence for a routine and in counting songs)indicate that they want ‘all’, ‘some’, or ‘a piece’ of cakeparticipate in activities that involve parts of a whole (e.g. cutting a piece of string or partially filling a cup)indicate when parts of pictures are missing or incorrectly placeddistinguish money from everyday objects of similar sizes and shapesuse everyday words for money, such as ‘cash’, ‘notes’, ‘coins’, appropriatelymatch coins and notes to real or pictorial representations of moneymake use of access cards for different purposes (e.g. Medicare card, cash card, video card, pre-paid bus card, library card)match various cards to familiar or real-life prompts (e.g. symbols, pictures, photographs of automatic teller machines (ATMs), buildings, shopsparticipate in routines associated with the use of cash cards to access cash or services (e.g. obtaining money from ATMs)participate in routines associated with the use of Electronic Funds Transfer at Point of Sale (EFTPOS) to buy goods and servicesparticipate in the purchase of goods and services using cash and vouchers. |

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| Level 1: Level statementStudents are developing a sense of number by knowing number names and counting in sequence. They recognise, compare, order and represent small whole numbers and use concrete materials to explore the concept of parts of a whole. They are developing an awareness of the cost of goods and recognise and represent notes and coins. Students identify and distinguish between situations that require them **to add or subtract, to share equally or to create equal groups.** |
| Core learning outcome: N 1.1Students identify, compare and order small whole numbers, make and match representations of these numbers and identify coins, notes and their uses. |
| **Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically** | **Core content** |
| Students know:number names a number has a position relative to other numbers how to count collectionshow to identify the quantity of a collectionways of representing numbershow to match representations of numbers how to compare and order small numbersattributes of coins and noteshow to identify coins and notesmoney is used in exchange for goods and services. | Students may:identify and order numbers into the counting sequence make and match representations of the counting sequence in different ways (e.g. on a blank number line, number line or hundred board) identify the position of a number relative to other numbers and explain reasoningidentify the pattern of the counting sequence to count from any given number using different representationsidentify the order of small numbers using a calculator to check or investigate different counting patternscount from a given number using different representations of numbers (concrete, verbal, pictorial, symbolic)make a collection and identify ‘how many’ in the collectionmake collections of small numbers using one-to-one correspondencemake and match different representations of the same small numbermake and order any representations of different small numberscompare collections visually and estimate whether collections have the same number describe ways of checking the closeness of an estimation by either counting or using subitisation (seeing a smaller group of items within a larger group)identify and compare small numbers using a five frame or ten framemake and match representations of small numbers using a five frame or ten framedescribe comparisons of quantities and numbers as being the ‘same’, ‘more’ or ‘less’ than each other and give reasons for judgmentsexplain ways to identify, compare and order small numbersidentify situations where a whole has been divided into portions and when part of a collection is identified (e.g. one biscuit from the tray in a packet)compare and describe portions as ‘parts of a whole’ using the language of ‘part’, ‘slice’, ‘bit’ or ‘piece’identify the different attributes of coins and notesmake and match representations of coins and notes to different representations of prices (e.g. price tags, advertisements)use money in exchange for goods and services. | Numerationwhole numbers 0 to 10number names 0 to 100parts of a whole* whole, part, slice, bit, piece

Number senseconservation of number 0 to 10position and order of numbers 0 to 10different representations of numbers (concrete, verbal, pictorial, symbolic)Moneygoods and services have a purchase priceterms* saving, spending, cost

attributes of coins and notes |
| At each level, investigations should occur in a range of contexts. For example, students could investigate:the number of items needed to fill the shelves in a play shopthe combinations of items to fill sample bags to sell at school eventsthe number of players needed for activities or gamesthe exchange of money for goods and services, such as in a class shop or for class activitiesallocation of numbers for particular purposes, such as queuing at the delicatessen or finding a seat on a plane data collected to answer specific questions, such as favourite pets, food preferences or popular games.  |

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| Level 2: Level statement Students demonstrate their developing number sense by comparing, ordering and representing whole numbers to 999 and understanding that the value of a digit in a number determinesits place. They understand that a whole can be made up of equal parts and use concrete materials to represent halves and quarters. When using money to purchase goods, they tender different combinations of notes and coins. Students are beginning to recall or work out some addition, subtraction and multiplication number facts. They use a range of computation methods, including mental, written and calculator,to solve problems. |
| Core learning outcome: N 2.1 Students compare and order whole numbers to 999, make and match different representations and combinations of whole numbers and of equivalent amounts of money, and identify simple fractions of objects and collections. |
| **Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically** | **Core content** |
| Students know:patterns of whole numbers to 999a number has a position relative to other numbers the place value of each digit within a number how to compare and order whole numbersways of representing numbersways of representing a number using different combinations of numbersthe language of equivalence the value of coins and noteshow to make different representations of equivalent amounts of money conventions for reading and recording dollars and centssimple fractionshow to identify simple fractions of objects and collections. | Students may:select a counting strategy appropriate for a given situation (e.g. counting in 2s to identify a house’s street number)make different arrangements of objects or pictures to assist the count (e.g. in groups of twos, fives or tens)represent the count in different ways (e.g. on a five frame or a ten frame, blank number line, hundred board or number line)identify the pattern of the counting sequence to count from any given number extend the counting sequence to number names for decades and hundredsmake and match different representations of each decade and hundred extend the counting sequence to number names within each decade and hundredidentify the position of a number relative to other numbersuse the position of a number (relative to other numbers) to describe how to locate that number on a different representationdescribe similarities and differences when the same counting pattern is used with larger numberscompare numbers to identify and explain similarities and differences between them (e.g. their number names, position relative to other numbers, order in the counting sequence, the quantity each represents and value of each of the digits)make and describe different combinations of the same number using place valueidentify and describe subsets of numbers (odd and even)compare numbers to identify those ‘greater than’, ‘smaller than’ or ‘of the same value’use known numbers to assist when ordering numbers on a blank number linegive reasons to justify the ordercount the number of equal parts of a whole that has been divided into halves and quartersname two equal parts of a whole or a collection as ‘halves’, and four equal parts of a whole or collection as ‘quarters’identify and explain ways to represent a half and a quarter of a whole identify and explain ways to represent a half and quarter of a collection identify the number of fold lines required to make halves and quarterscompare the number of fold lines with the number of equal partsidentify ways to check that the parts of a collection or whole are equalmake different combinations of coins and notes to match displayed pricesmake different combinations of cash to the same amount to pay for goods or servicesread and record prices in dollars and centsexplain that change is given when too much money is tendered for purchases. | Numerationwhole numbers to 99, then to 999place value to hundredsequals (=), does not equal (≠)fractions in context* equal parts of a whole
* half (1 part out of 2 equal parts)
* quarter (1 part out of 4 equal parts)

Number senseconservation of number (whole numbers)position and order of numbers* relationships between numbers

different representations of numberssubsets of whole numbers* odd and even

Moneygoods and services have a purchase price* tendering cash for purchases

equivalent valuesconventions* reading and recording dollars and cents
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| **At each level, investigations should occur in a range of contexts. For example, students could investigate:**illustrations of large numbers, such as the number of windows in skyscrapers the numbers of insects in coloniesprofiles of numbers — listing what is known about a specific number and finding out morecommunity use of numbers, such as house numbers or numbers in advertisementspage number references for research purposes different ways in which numbers are represented in games and puzzles, such as cards or dominoes combinations of notes and coins to pay for goods or services in a class shop or enterpriseadvertised prices for a desired item to identify highest and lowest priceshow to share collections between two or four equal groupsways of folding paper to create decorations or paper sculptures. |

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| Level 3: Level statementStudents compare, order and represent whole numbers to 9 999, common and decimal fractions and recognise the value of each digit. They tender appropriate amounts of money for cash transactions and identify other methods of paying for goods and services. Students recall or work out all addition, subtraction and multiplication number facts and some division facts. They use a range of computation methods, including mental, written and calculator, to solve problems that involve whole numbers and decimal fractions in context. |
| Core learning outcome: N 3.1Students compare, order and represent whole numbers to 9 999 and common and decimal fractions, calculate cash transactions and describe other methods of payment. |
| **Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically** | **Core content** |
| Students know:patterns of whole numbers to 9 999patterns of common and decimal fractionssimilarities and differences in patterns of whole numbers and common and decimal fractionsthe place value of each digit within a whole number and decimal fractionwhole numbers and common and decimal fractions have positions relative to other numbershow to compare and order whole numbers and common and decimal fractionsways of representing whole numbers and common and decimal fractions the same whole number or common or decimal fraction can be represented using different combinations of smaller numbersparts of a whole can be represented as common or decimal fractionsmental computation strategies and computation methods to calculate cash transactionsconventions for reading, recording and rounding dollars and centsmethods of payment. | Students may:identify patterns when counting forwards and backwards from any number using a range of counting strategies (e.g. by 50s, 200s, 1 000s)identify or represent the counting patterns on number charts, number lines and calculatorsexplain similarities and differences among counting patterns and extensions of counting patternsrecord whole numbers and common or decimal fractions in different ways, including on a blank number lineorder numbers, including whole numbers and common and decimal fractions, by identifying the position of numbers relative to other numbers and explain reasoningcompare and order various representations of equal parts of a wholecompare and order whole numbers, and common and decimal fractions, and use symbols to indicate whether numbers are ‘greater than’, ‘equal to’ or ‘less than’ other numbersrepresent whole numbers and common and decimal fractions on a number line and explain which are ‘greater than’, ‘equal to’ or ‘less than’ othersrepresent a whole number and decimal fraction in different ways, including on calculatorscompare and describe the value of digits in different places in whole numbers and in decimal fractionsexplain similarities and differences between the place value of whole numbers and the place value of decimal fractionsrepresent and record regroupings of whole numbers, and regroupings of common and decimal fractions, in different waysuse place value to identify and explain regroupings of the same numberuse alternative methods to check the value of the regroupings, such as calculators or written computationidentify and describe subsets of whole numbers (multiples and factors)identify and describe common fractions and decimal fractions used in various situationsidentify links between common fractions and decimal fractionsexplain the position of a fraction relative to a whole and relative to other fractions and give reasons for the judgment e.g. ‘I’d put 1¾ between 1 and 2 on a number line because it is bigger than 1 but smaller than 2’interpret amounts of money represented in a variety of wayscompare, order and match different combinations of amounts of cashcalculate the total cost of items rounding totals as requiredidentify whether a specified amount of money is ‘enough’ or ‘not enough’ for purchasestender amounts of money to cover costsestimate or calculate changerecord amounts of money as required using conventions e.g. 96c or $0.96identify and explain a variety of payment methods for cashless transactions. | Numerationwhole numbers to 9 999decimal fractions in context* tenths, hundredths

place value from thousands to hundredthsgreater than (>), equal to (=), less than (<) fractions in context* equal parts of a whole
* common fraction format
* decimal fraction format

Number senseconservation of number (whole numbers, decimal and common fractions)position and order of numbers* relationships between numbers
* sensible adjustments of numbers

different representations of numberssubsets of whole numbers* multiples
* factors

Moneycash transactionscashless transactions(e.g. EFTPOS, prepaid cards, accounts)equivalent valuesconventions* reading
* recording
* rounding totals for cash purchases

change |
| **At each level, investigations should occur in a range of contexts. For example, students could investigate:*** number of spectators at an event
* advertised prices for electronic games or toys to make comparisons
* distances between geographical locations
* holiday deals
* ways that amounts of ingredients for cooking can be represented
* ways measurements of fabric, craft or building materials for construction projects can be represented and compared
* results in field events, such as long jump (metres and centimetres)
* ways of creating equal groups of students for sports activities or for performances
* rounding totals for cash purchases of items to stay within a specified budget
* combinations of notes and coins that could be used when giving change
* different methods of payment for electricity or telephone accounts.
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| Level 4: Level statementStudents compare and order whole numbers and common and decimal fractions. They identify fractions expressed in different ways and make connections between common fractions, decimal fractions and percentages. They identify a range of factors such as advertising, discounts and methods of payment that may influence financial decisions. Students recall all addition, subtraction, multiplication and division number facts. They use a range of computation methods to solve problems that involve whole numbers, common and decimal fractions, percentages and rates.  |
| Core learning outcome: N 4.1Students compare and order whole numbers and common and decimal fractions of any size, make connections between key percentages and fractions, and describe how a range of factors influence financial decisions. |
| **Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically** | **Core content** |
| Students know:patterns of whole numberspatterns of common and decimal fractionssimilarities and differences in patterns of whole numbers and patterns of common and decimal fractionsthe place value of each digit within a whole number and decimal fraction whole numbers and common and decimal fractions have positions relative to other numbershow to compare and order whole numbers and common and decimal fractions of any size percentage is a fraction based on hundredths of a whole or parts out of 100key percentagesconnections between common or decimal fractions and percentageshow to represent common and decimal fractions as percentages and vice versathe need for financial decisionsfactors that influence financial decisionshow a range of factors influence financial decisions. | Students may:identify and interpret common and decimal fraction formatsexplain the relationship between common fractions and divisionidentify equivalence between common fractionsidentify common fractions, improper fractions, decimal fractions and mixed numbers that are equivalentlocate and compare the position of whole numbers and common or decimal fractions on a number line or blank number line and give reasons for the placementdevelop referents for common fractions (e.g. knowing ¾ is between ½ and 1, 7/8 and 9/10 are close to 1)use symbols to identify whether common or decimal fractions are ‘greater than’, ‘equal to’ or ‘less than’ other fractions identify and explain why an infinite range of fractions can be placed between any two numbersmake sensible adjustments of numbers as requiredapply and explain the use of square and cubic notation in problem situations, such as in measurement contexts involving area or volumeidentify patterns and compare the size of whole numbers and decimal fractions and the value of digits in different placescompare and order whole numbers and decimal fractions using place valueuse everyday representations, such as 1.5 m (1 500 000)identify and explain regroupings of the same numberrepresent and record regroupings in a variety of waysidentify and describe subsets of whole numbers, including prime, composite, square and triangular numbersexplain percentage as a fraction of 100 and represent using percentage symbolidentify and explain connections between percentages and their equivalent representations expressed as hundredthsmatch and explain connections between key percentages, and common and decimal fractionsselect and use connections between key percentages and fractions to assist in solving problemscompare key percentages and common and decimal fractions, such as ¼, 0.25 and 25%, and determine whether one is ‘more than’, ‘less than’ or the ‘same as’ anotherorder the percentages and fractions in different ways such as in ascending and descending order e.g. 25%, ½ , 0.75list and describe the factors influencing financial decisionsinterpret factors and identify unavoidable costsidentify factors that impact on potential income, savings or costsexplain advantages and disadvantages associated with various factorsdetermine potential income, savings or costsexplain the importance of careful budgetingconduct market research to confirm or refute speculationsmake financial decisions based on understandings of best buys, discounts, methods of payment. | **Numeration**whole numbersdecimal fractionskey percentages (100%, 50%, 25%, 20%, 10%,1%)fractions* common fractions format
* terms (vinculum, numerator, denominator)
* decimal fractions format
* percentage format
* equivalence

square and cubic notationNumber senseposition and order of numbers* relationships between numbers
* sensible adjustments of numbers

connections between key percentages, unit fractions and decimal fractionseveryday representations of numbers (e.g. 20K/20 000, $1.5m/$1.5 million, $3b/$3 billion)subsets of numbers* prime and composite
* square
* triangular

Moneyfinancial decisions* purchases (best buys, discounts)
* advertising (for purchases)
* methods of payment
* budgets for specific events

key percentages* simple interest
* discounts

cashless transactions (e.g. cheques, money orders, EFTPOS, store cards) |
| At each level, investigations should occur in a range of contexts. For example, students could investigate:populations and debts of selected countries various quantities needed for different recipes the sizes of different scale models living standards in different countries according to employment rates, mortality rates versus birth rates, etcetrasporting performances based on player statistics media claims on social issuesopinion pollsclass enterprises, such as a stall at the fete or a class musicaldevelopment and marketing of productshow different bank accounts operatebest buys using advertising materials.  |

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| Level 5: Level statementStudents compare and order positive and negative integers and explain and record index notation. They interpret and use conventions for expressing rates and ratios. They identify methods of saving and investigate the factors affecting debit and credit transactions. They understand that the purchase of goods and services may attract fees or charges. Students use a range of computation methods to solve problems that involve positive rational numbers, rates, ratios and direct proportions. |
| Core learning outcome: N 5.1Students compare and order integers, use and interpret index notation, rates and ratios, and analyse options to make informed financial decisions about saving, credit and debit. |
| **Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically** | **Core content** |
| Students know:integers represent positive and negative whole numbers integers have a position relative to other numbers on a number line how to compare and order integersindex notation is a way of representing numbershow to use and interpret index notation rates and ratios represent relationships between quantitieshow to use and interpret rates and ratioshow to analyse financial optionsthe relevance of and need for financial decisionsfactors that influence financial decisions about savings, credit and debithow to make informed financial decisions about savings, credit and debit. | Students may:position integers on a number linecompare and order integers record integers using conventionsanalyse the relative distances between integers on a number line and explain how integers are added and subtracted identify and describe patterns using square, cube and exponential numbers (e.g. refer to formulae for measurement of regular shapes)identify square root as the inverse of squaringrewrite equivalent forms, such as side times side and S2explain ‘rate’ as being the relationship between ‘unlike’ quantitiesuse conventions for recording rates for different situationsuse rate to calculate quantities, such as the cost of a number of items or the cost per item given the total cost of a number of itemsexplain ‘ratio’ as being the relationship between ‘like’ quantitiesuse conventions for recording ratios for different situationsuse ratio to calculate quantitiescompare and contrast financial options, such as fees and charges on credit and debit transactions, different saving methods, financial transactions involving discounts or lay-bysdetermine and explain short-term benefits and/or long-term consequences of financial decisions. | **Numeration**integersindex notation (whole number indices only)square rootpercentage* whole percentages (e.g. 65%, 110%)
* fractional (e.g. 6.5%, 12½%)
* greater than 100%

Number senseposition and order of numbers including integers* relationships between numbers
* sensible adjustments of numbers

connections between squares and square rootsconnections between percentages and fractionsMoneyfinancial decisions* credit and debit transactions
* charges/fees (including GST)
* advertising (of financial services)
* short-term benefits and/or long-term consequences
* methods of saving

cashless transactions (e.g. direct debit, BPAY)percentages* interest
* discounts
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| **At each level, investigations should occur in a range of contexts. For example, students could investigate:**temperatures from a range of locations, including outer spacearea and volume calculations when constructing and renovatingfruit, vegetables and groceries items that represent best value for moneythe amount of catering materials required for varying numbers of peopleratio between similar trianglesrelationships between quantities on graphsmobile phone plansrelationship between diameter and circumference of circlescale for plans and mapsfinancial transactions involving profit and loss or bank balancesavings associated with a part-time jobinterest ratesfactors to be considered when opening a savings account, such as interest rates, fees, number of free transactionsplans and budgets for personal shopping. |

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| Level 6: Level statementStudents compare and order rational numbers and use scientific notation as a short-hand method of representing very large or very small numbers. They develop personal plans, consider financial options and monitor financial situations using available information. Students use a range of computation methods and strategies to solve problems that involve rational numbers, rates, ratios and direct and inverse proportions. |
| Core learning outcome: N 6.1Students compare and order rational numbers, interpret and use scientific notation and analyse options to make informed personal budgeting and other financial decisions. |
| **Elaborations — To support investigations that emphasise thinking, reasoning and working mathematically** | **Core content** |
| Students know:rational numbers include whole numbers, fractions and integershow to compare and order rational numbersscientific notation can represent rational numbershow to interpret and use scientific notation how to analyse financial optionsfactors that influence personal budgeting decisionshow to make informed personal budgeting and other financial decisions. | Students may:explain rational numbers as being numbers that can be represented in the form a/b, where a and b are integers and b is not 0identify and describe scientific notation as representations of very small and very large rational numbers using negative and positive indicesinterpret scientific notation and other representations of number, such as calculator representations involving powers of 10position rational numbers on a number linerecord rational numbers using conventionscompare and order rational numbersanalyse the relative distances between rational numbers on the number line calculate using sensible adjustments of numbersanalyse the advantages and disadvantages of solutions to financial issuesuse the analyses of options to justify financial decisions. | Numerationrational numbersindex notation (integer indices)scientific notation (positive and negative powers of 10)Number senseposition and order within the set of rational numbers* sensible adjustments of numbers

connections between scientific notation and other representations of numbersMoneyfinancial decisions and budgeting* income (gross, net)
* expenditure
* saving for a purpose
* borrowing
* savings plan
* planning for an event
* consequences of over-commitment

percentages* compound growth

cashless transactions (e.g. internet and phone banking)comparisons of rates, fees and charges |
| At each level, investigations should occur in a range of contexts. For example, students could investigate:distances in outer spacemicroscopic representationswater qualitymolar concentrations in chemistry financial records, such as ledger entries, bank statements, personal budgetsplans and budgets, such as for a school dance, party, holiday trippurchase of personal items of a substantial cost and goal settingdifferent financial scenarios, such as income, expenditure, savings plansinterest rates involving compound growthpayment plansconsequences of over-commitmentfees and charges on credit and debit transactionsanalysing short-term and/or long-term benefits and consequences of financial decisions. |