Proportions and ratios, Fractions and Decimals

NPD Stages	Operational domains (Strategy)	NUMICON	Numicon Milestone points
Stage 1 (one to one counting)	I am trying to make my sets the same.	**Firm Foundations** **Breaking Barriers** Pattern and Algebra 6 NNS 2, 20 Cal 6 **Numicon 1** NPC SF2	Same and different Matching
Stage 2 (counting from 1 on materials)	I can share equally using materials.	**Firm Foundations**	Doubles and halves
Stage 3 (Counting from 1 by imaging)	I can divide a region into equal parts using materials. I can share equally using materials or imaging.	**Breaking Barriers** Cal 16, 17	
Stage 4 (advanced counting)	I can divide a region into equal parts using materials or imaging. -I can share equally using materials or imaging.	**Numicon 2** Numicon 1 NPC CAL 5	I know that 'half' means one of two equal parts of an object, shape or quantity
Stage 5 (early additive)	-I can find a fraction of a number.	**Breaking Barriers** Cal 18 **Numicon 2** Numicon 2 NNS 6 Numicon 2 CAL 15, 16	I know that 'quarter' means one of four equal parts of an object, shape or quantity I can read, recognize, find and write and explain that fractions are between whole numbers on the number line fractions of a number. ½, ¼, 1/3, ¾ I can explain equivalence between ½ and 2/4 I understand ¾ as three of four equal parts I can divide 'How many…in…?
	-I can solve division problems with remainders in my head using halving or what I know about basic facts.	**Numicon 3** Numicon 3 NNS 7, 8 Numicon 3 CAL 7, 11, 15, 16	I can solve problems with fractions of a whole and fractions as numbers I can use fraction notation to describe parts of a discrete set I can interpret a remainder as what is left after grouping I can use dividing to solve problems with sharing, knowing that there can be remainders in sharing situations
Stage 6 (Advanced Additive-	-I can use repeated halving or known multiplication and division facts to solve	**Numicon 4**	I can: -recognise and show, using diagrams, families of common

Early Multiplicative)	problems. -I can find fractions of a set or region. -I can rename improper fractions. -I can solve division problems that have remainders. -I can use simple repeated multiplication to solve simple problems involving ratios and rates.		equivalent fractions -count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10 -solve problems involving fractions to calculate quantities, and fractions to divide quantities -add and subtract fractions with the same denominator -recognise and write decimal equivalents of any number of tenths or hundreds -recognise and write decimal equivalents to two places -find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths -round decimals with 1 decimal place to the nearest whole number -compare numbers up to 2 decimal places -solve simple measure and money problems involving fractions and decimals to 2 decimal places -use multiplication and division to solve problems involving ratios and rates.
Stage 7	I can: -Read decimals to three places -Identify symbols for any fraction, including tenths, hundredths, thousandths, and improper fractions, e.g., 56/10 -Count forwards and backwards in halves, thirds, quarters, fifths, and tenths at least -Order unit fractions (top number of one) such as 1/2 , 1/3 , 1/4 , and 1/5 -Say the decimal number word sequences forwards and backwards in tenths and hundredths. -Round decimals with up to two decimal places to the nearest whole number e.g., round 6.49 to 6, 19.91 to 20 -Know tenths and hundredths in decimals to two places e.g., tenths in 7.2 is 72.	**Numicon 5** NNS 2 and 3 Cal 1 and 2 Cal 4	I can: -explain equivalences between improper fractions and mixed numbers -use my knowledge of factors and multiples to recognize and and explain equivalences between proper fractions -recognize and explain decimal and common fraction equivalents - solving adding and subtracting number problems involving whole numbers up to 1000 - solving adding and subtracting problems involving fractions and decimal fractions efficiently - round up decimals to to two places and to the nearest whole number and to one decimal place - find the term-to-term rule for a linear sequence involving whole numbers, fractions and decimals and work out missing terms - use multiplying and dividing facts and knowledge of factors and multiples to solve problems - solve problems effectively by finding fractions of amounts, making use of multiplying and dividing facts - use knowledge of factors and multiplies to find equivalent

		NNS 6 and Cal 7	fractions and to simplify fractions to their lowest terms. - compare and order fractions with denominators which are multiples of the same number - use column algorithms to solve problems of + - x and ÷ with whole numbers and up to 3 decimal places - use multiplying facts to x and ÷ whole numbers and decimals by 10, 100, and 1000 - calculate with powers of 10 to solve problems of x and ÷ - use x and ÷ to solve problems involving scaling - explain percentage as the number of parts per hundred - find and explain percentage, fraction and decimal equivalents in order to solve problems in context.
Stage 8	I can: -Recall fraction ↔ decimal ↔ percentage conversions for given fractions and decimals -Know the number of tenths, hundredths, that are in numbers of up to three decimal places e.g., there are 456 tenths in 45.6 -Know what happen when a whole number or decimal is multiplied or divided by a power of 10, e.g., 4.5 x 100 = 450 -Round decimals to the nearest hundred, ten, one, one-tenth, or one-hundredth. -Say the number one-thousandth, one-hundredth, one-tenth, one, ten, etc. before and after any decimal number -Order fractions, decimals, and percentages		I can: -use common factors to simplify fractions; use common multiples to express fractions in the same denomination compare and order fractions, including fractions > 1 -add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions -multiply simple pairs of proper fractions, writing the answer in its simplest form -divide proper fractions by whole numbers -associate a fraction with division and calculate decimal fraction equivalents for a simple fraction -identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places -multiply and divide up to two decimal places by whole numbers - rounding decimals to the nearest hundred, ten, one, one-tenth, or one-hundredth -recall and use equivalences between simple fractions, decimals and percentages -solve problems of two quantities where missing values can be found by using integer multiplication and division facts -solve problems involving the calculation of percentages and the use of percentages for comparison -solve problems involving similar shapes where the scale factor is known or can be found -solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.