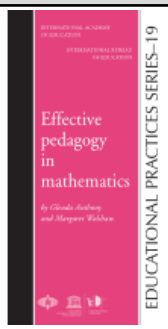
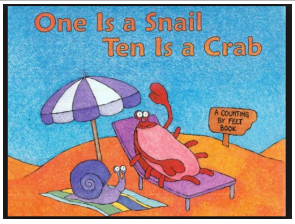
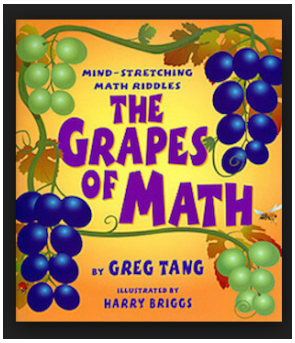
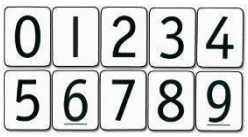
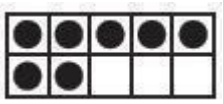
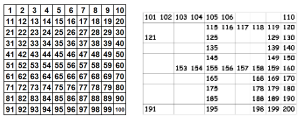
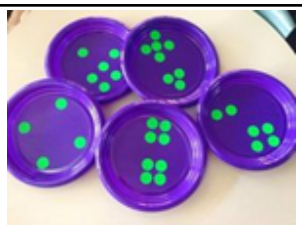
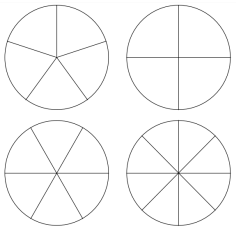
Effective use of equipment to support students' learning in maths

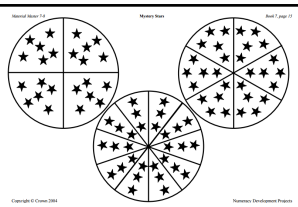
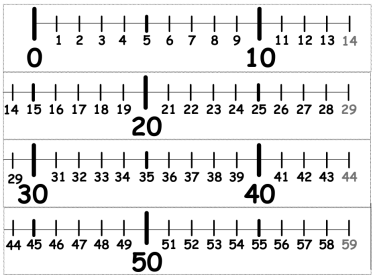
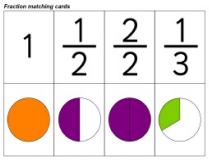
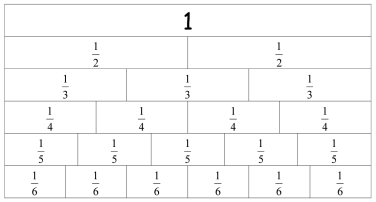
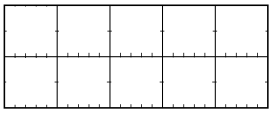
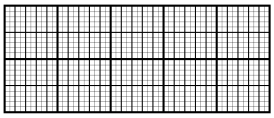
Equipment	Notes	Priority
	Refer to Effective Pedagogy in Mathematics *Tools and Representations (Principle 9)* Article on the use of manipulatives and its importance: http://nrich.maths.org/10461	
Early number ideas		
Picture books with maths content		
	One is a snail Ten is a crab on Tahurangi	
	http://mrgrant.ca/1_Content/3_Documents/The%20Grapes%20of%20Math.pdf	
Number fan 	First to draw….teacher calls out a problem and the first to show it on the number fan wins a counter. e.g. show me: one more than 5 one hundred more than 245 one ten and 5 ones 56 tenths a decimal for ½ a decimal for 50% etc… material master	
Digit cards 	Identify numbers Count forwards and backwards Numbers before/after	

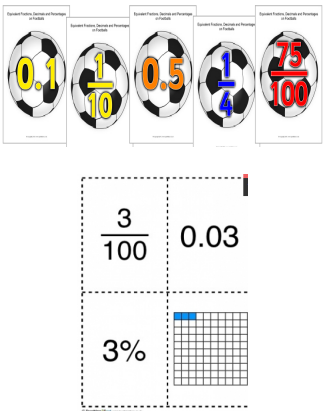
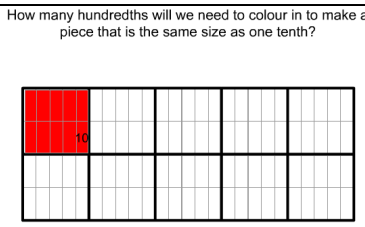
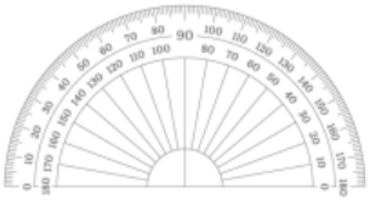
	Match number of objects to the number card Match tens frame dots and/or dice dots to the numbers	
Fly Swats 	Place digit cards in the middle of students sitting in a circle Call out, e.g. 5x4= 4+3= 6-1 etc Can be used with fraction cards and subitizing too First to 5 jelly beans wins or keep card when win it and person with most cards when all the cards gone	
Tens Frames 	Subitizing-instantly recognise the dots spaces without counting Making tens-5 dots plus 5 spaces equals 10 Counting in tens-add the frames with ten dots Subtraction of tens Basic facts to 10-add/sub using blank frame and 2 sided counters Add and subtract using 'smart splits'-use blank tens frames and counters. e.g. 9+6 as 10+5 23-5 as 23-3-2 Multiplication-show groups Decimals and tenths-using tens frames as the whole or '1' material master	
Hundreds Board  Thousands Book	Hundred Board Snakes (Bk 4, pg 16) • Dice - plus ten minus ten - start at a number and subtract/add • Take a pen for a walk - blank - what's this number • Square with a hole - what numbers are covered? before/after • Skip counting • Use blank hundreds board-write numbers in the columns	
Happy Hundreds Board 	Happy hundreds board • What do you notice? What do you wonder? • Using L strip to cover them • Used for multiplication-use template from material masters (above) and cut out arrays. Record how many faces using repeated addition and progress onto using multiplication facts	

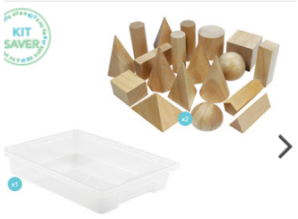
Popsicle Sticks 	**Place value** Bundle of tens to count in tens Ten and ….. Match with arrow cards to show that 54 is 50 (5 bundles of 10) and 4 Use for units to measure with Candles on a cake (paper with cake drawn on it). 5 candles and 1 more=	
Arrow Cards 	Make a number-expand to show the hundreds/tens/ones e.g. 452 is 400+50+2 (4 hundreds, 5 tens and 2 ones) Use other equipment to show this, eg. money, popsicle sticks Put cards into a pile of one digit, two digit and 3-digit numbers. Who has the highest number? (shuffled) - can we order them? One more/one less, 10 more/less, 100 more/less	
Dice 	https://nrich.maths.org/8414 $2 shop has ordinary dice (inexpensive)	A
Double-sided counters 	Using counters with only two colours can be less distracting and can focus on the strategy being taught Five plus facts ten plus facts Combination of tens using the two colours Roll handful of 10 counters and ask student to say how many red. Then cover so they image the rest rather than count (link to number bonds) Arrays/commutativity-multiplication Modern teaching aids	
Bead Frame 	Counting in ones, twos, tens Imaging-I have six rows and 4 more- How many do I have? Ten plus (teen numbers) Adding-count on from the largest number	A

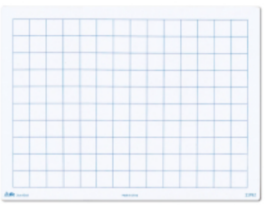
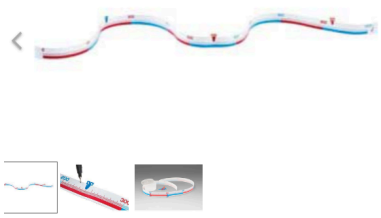
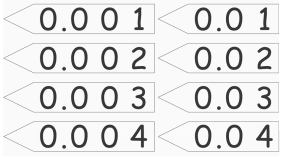
	Compatible numbers-70+30=100 27+73=100 Addition and subtraction- 67+10, 82-20 Multiplication-groupings and deriving Percentages and fractions	
Dominoes 	Number cards-match number of dots to number card. Link to number bonds, e.g. 4+3, 3+4, 5+2, 2+5, 6+1, 1+6 all equal 7 Adding numbers together, find the difference, multiply, subitize https://nrich.maths.org/1200 http://mathwire.com/numbersense/dominoes.html	
Money 	**Place value** ● Teacher places a note in a pile and the students count. Counting in ones, tens and 100's (notes mixed up) ● Write this number down. How many tens in the whole number? ● Take the notes away from the pile and subtract from the total Creative classrooms	
Playing Cards 	https://practicalpages.files.wordpress.com/2011/09/maths-card-game-rules.pdf	A
Animal Strips 	**Addition/imaging**-Lay a strip down upside down and place another animal strip next to it right side up. How many animals are there altogether? Used for arrays-lay strips in rows. Support **multiplication** progression from skip counting to repeated addition to using multiplication facts e.g. stage 4 5,10,15 (skip counting) stage e5 5+5 (10) + 5=15 (repeated addition) stage 5 3 x 5=15 (multiplication facts) Commutativity-5x4 is the same as 4x5 (same value but looks different)	

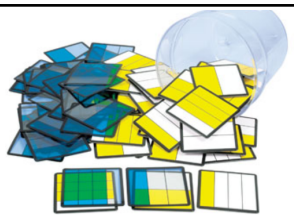
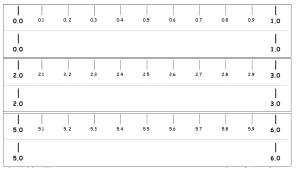
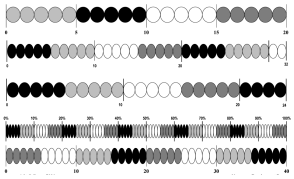
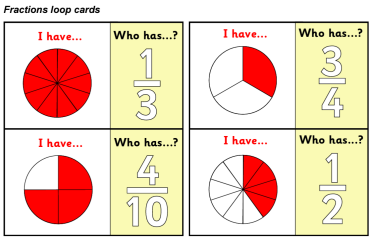
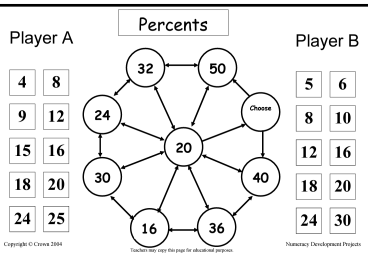
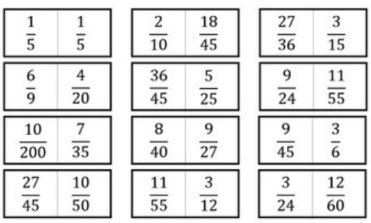
Teddy Bears & other  counters 	Counting-one to one, skip counting Number stories: adding and subtracting e.g. teddy bears on a blank tens frame (10 bears at a picnic. 5 already arrived and on the blanket. How many more?) Link to knowledge of numbers within 10 (or 5) 5 bugs on a leaf. 2 ate too much so flew off for a sleep. How many left? (5-2=3) Multiplication-grouping 2 bugs on 4 leaves. 2, 4, 6, 8 2+2+2+2 2x2	
Multi-link Unifix cubes 	Use two colours. How many ways can you make 10?(5 red + 5 blue, 6 red and 4 blue etc) Counting in ones, twos, fives, tens Five plus facts (sticks of one colour for fives and another colour for the number adding. Ten plus facts Basic facts to 10 (add and sub) Addition and subtraction of tens (e.g. 32+10, 58-20) Multiplication-groups of 5 in one colour and 2's in another-derive facts. e.g. x7 as x5 + x2 Division-share into equal groups, fraction of a group	
	**Subitizing**: (The ability to 'see' a small amount of objects and know how many there are without counting). http://nrich.maths.org/2479 https://www.slideshare.net/khrycan/dot-cards http://www.slideshare.net/jwalts/dot-card-and-ten-frames?related=1	
Fraction Pieces 	**Fractions:** Fraction pieces-Material Masters Identifying fraction symbols to picture representations Finding a fraction of a set using skip counting, repeated addition, multiplication (use counters/jelly beans for the sets) e.g. ¼ of 16=4 4, 8, 12, 16 4+4+4+4 (8+8)=16 4x4=16	
Mystery Stars	Equipment Animation Mystery Stars-material masters Using multiplication to find a fraction of a set Start with the part-whole	

	¼ of ?=6 or ¼ of 24=? 2/4 of 24=? etc	
	Number lines Number line masters: 1- 100 etc (material master) Number lines Creative Classrooms (including negative and decimals	C
Essentials for later years		
	Place value blocks (base 10 only) Creative classrooms wooden plastic Modern teaching aids A big selection here	A
	Cuisenaire rods Modern teaching aids	B
  	Strips of paper for building a fraction wall Match the equivalent fractions Use the strips for measuring objects around the classroom SparkleBox-Fraction matching cards	A
Decimals  		A

	[Equivalent Fractions-SparkleBox]  Fractions, decimals and percentages-matching cards http://www.teachingideas.co.uk/subjects/percentages	
	Measuring equipment - Rulers (short and long) (metre ruler) - Tape measures - Scales including bathroom scales and smaller electronic scales - Protractors (small) and for board - Measuring jugs and cylinders, cups etc - 10 L buckets: FREE from Resene - Long tape measures eg 30m 50m - Other measuring tapes (eg builder table measure) - Trundle wheel	A
	Thermometers Creative classrooms	B
	Metric dominos Could find a master for this to make up?	A
	Model of 1 metre cubed Modern teaching aids	B

	1 metre squares (From Resene paint) FREE	A
	Geometry Shapes - Examples of prisms and non-primes - Cones, pyramids etc Creative Classrooms Another kind from Creative classrooms	B
	Folding geometric shapes Creative classrooms	B
	Litre sets	C
	Compass - Individual - Whiteboard compass	B
	Clocks (analogue) & digital analogue analogue cheaper kmart	B
	Lots of cubes/blocks for building could be multi-link cubes Creative classrooms set of 1000 $199.90	A

	Modern teaching aids	
	Spinners - Ready made spinners (numbers) Colour spinners	B
	Different Dice - 10 sided dice - 12 sided dice - 4 sided dice	B
	Calculators (check that they do BEDMAS: check by putting 2 + 3 x 4 into the calculator …the answer should 14. If it says 20 the calculator does not use BEMA)	A
	Mini whiteboards Example with 2cm grid Pack of 30 ~$70 	A - B
	Magnetic fraction strips Modern teacher aids	
	Number lines - 1 to 1000 Modern teaching aids	C
	Decimal arrow cards	A

	Fraction multipliers Modern teaching aids	C
	Decimal number line flip strip	
	Percentage strip	A
	Fraction Decimals Percentage Loop cards Various: Sparkle box	A
	Percentage game	B
	Convert fractions decimals percentages (match up activities Online download. F/D/% dominoes Matching benchmark fractions Modern teaching aids	A
	Equivalent fractions Online download. Dominos	