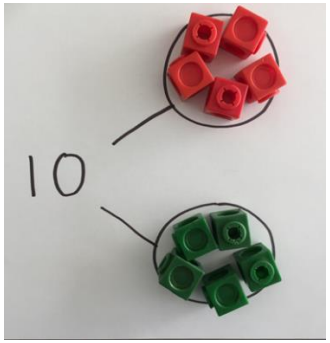
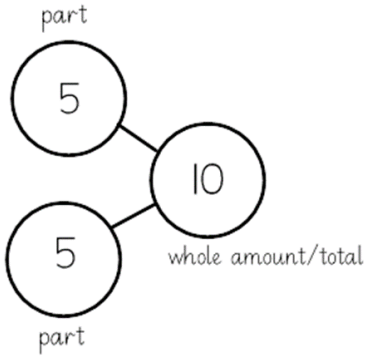
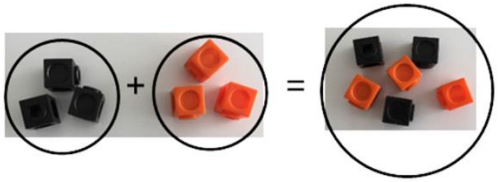
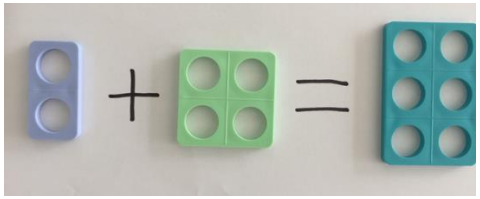
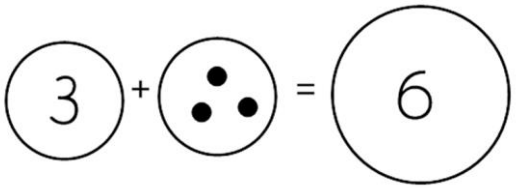
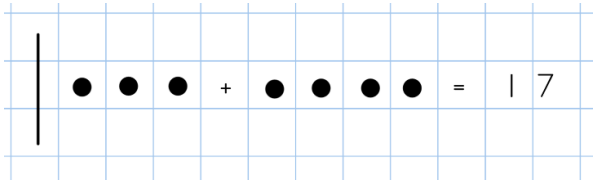
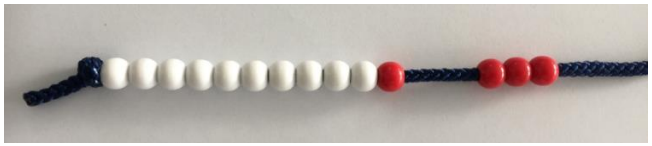
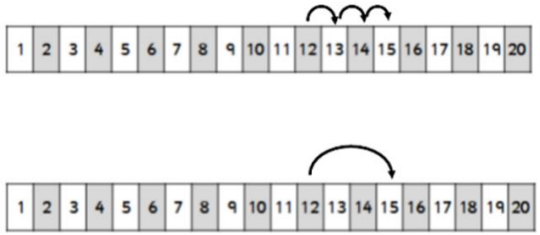
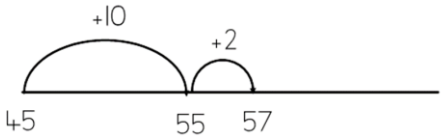
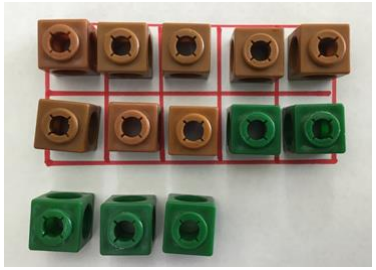
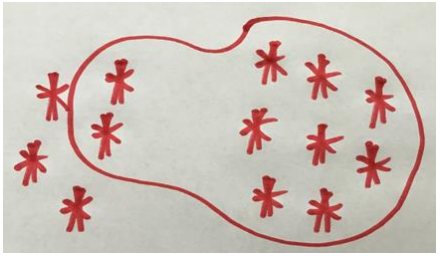
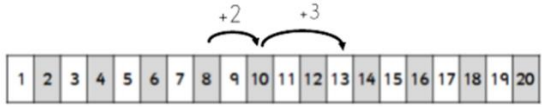
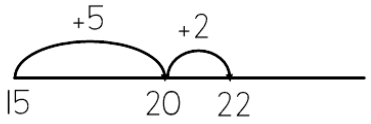
Addition

1. **Aggregation structure of addition.** This is where two or more quantities are combined into a single quantity and the operation of addition is used to determine the total. Language used includes: How many altogether? How many in total?
2. **Augmentation structure of addition.** This is where a quantity is increased by some amount and the operation of addition is used to determine the increased value. Starting from the biggest number and counting on. Language used includes: start at and count on, increase by, go up by. This includes 'Regrouping to make 10'. Using related number bonds to solve simple addition calculations.

	Concrete	Pictorial	Abstract
1. Aggregation structure of addition. *Combing two parts to make one whole amount/total.* *How many altogether? How many in total?*	*Use cubes to add two numbers together as a group or in a bar.* Step 1 Children will be taught to combine two sets practically. Teacher to model calculation and use this to introduce symbols. Refer to equal as 'same as'. Part-whole amount/total model Cubes 5 + 5 = 10 10 = 5 + 5 	*Use pictures to add two numbers together as a group or in a bar.* Progress to writing the numerals into the part-whole amount/total model. Start with picture in the 'parts' and progress to written numerals. Part-whole amount/total model 	Move on to written calculation. Possible to make links to inverse at all stages. 5 + 5 = 10 10 = 5 + 5 10 – 5 = 5

	Step 2 Move to horizontal representation practically. 3 + 3 = 6  Numicon 2 + 4 = 6  Step 3 Over 10 	Progress to representation below to encourage counting on.   Progress to drawing base ten using lines and dots. One per square. 	Move on to written calculation. 3 + 3 = 6 6 = 3 + 3 Move on to written calculation. 2 + 4 = 6 4 + 2 = 6 6 = 2 + 4 Move on to written calculation. 13 + 4 = 17

2. Augmentation structure of addition. *Starting from the biggest number and counting on.*	*Starting with the largest number and moving the beads one by one.* 11 + 3 = 14 	*Starting with the biggest number. Start with counting in ones and then progress to jumps.* Drawing a number line and count on. For example, 12 + 3 =15  Progress (in year 2) to jumping in numbers rather than counting forwards in ones: 45 + 12 = 57 Partition the 12.  Also, hundred squares could be used. Start at a number and counting on. *Use pictures or a number line. Regroup or partition the smaller number to make 10.*	*Placing the larger number in their head and then counting on.* Move on to written calculation. Useful to jump to the nearest 10 or jump in tens and then ones as seen in pictorial examples.

Regrouping to make 10	*Start with the bigger number and make 10 using the smaller number.* 8 + 5 = 13 	8 + 5 = 13  Number line 8 + 5 = 2 3 add 2 then 3 to cross the 10.  Progress (in year 2) to: 15 + 7 = Jump to nearest ten by partitioning the 7. Progress to abstract number lines showing jumps rather than each interval.  	Move on to written calculation. 8 + 5 = 13