


ADDITION AND SUBTRACTION



Mathematics – Number: Addition and Subtraction

Area	Objectives	Suggested Activities	Vocab
Early Addition and Subtraction Skills			
Cross-curricular links			
<p>PE – in games involving scoring points with balls/bean bags in hoops encourage children to compare the size of the groups. Children compare scores during games. Who has won? Who got more points/less points?</p> <p>Art –add 1 more mark or collage piece or scoop of paint. Looking at lines/objects/images and discuss 1 and lots. Adding two different colours of paint.</p> <p>DT – Foundation Stage: Count, comparing and combining numbers of transport. Year 1: count, compare and combine junk material. Use language 1 and lots. Year 2: adding with puppets. Year 3: adding 1 more to decorations on photo frames.</p> <p>Year 4: 1 and lots when looking at parts in circuits. Year 5 and 6: comparing amounts of materials for projects, adding more or less.</p> <p>Science – exploring things in nature or materials in the class – 1 and lots. Combining items such as liquids or soils. 1 more push/pull.</p> <p>PSHE – comparing groups of animals, number of body parts.</p> <p>Literacy – KS1: using language 1 and lots in storytelling.</p> <p>KS2: use language such as add, more during instruction writing.</p> <p>History – when looking at battles compare the size of armies.</p> <p>Geography – settlements – look at language more/less/lots/ few/one when describing features of different settlements or less economically developed countries or animals including endangered.</p> <p>ICT – Foundation Stage and KS1: use computer activities such as Percy. KS2: use computer activities such as MathBase and Education City. Look at the combining of steps in programming.</p> <p>Music – include language such as 1 more beat, lots of drum.</p> <p>Cooking – look at amounts of ingredients and compare – 1 and lots. Children add more and less. Join groups of ingredients – counting and giving totals.</p>			
0 – 3 years (8–20 months)	To observe and respond to changes.	<ul style="list-style-type: none"> • During games, emphasise the language winning, receiving, having, taking, gaining, losing, noting, depleting, enough, need more and less. • Play 1:1 matching activities with a range of equipment (anticipating receiving, increase or decrease). • During a range of everyday activities encourage children to identify the bigger of a quantity. • Play games which involve winning and losing objects, coins or tokens. • Look for lost articles or collect equipment for a group – discuss ‘have we got them all?’ • Provide opportunities to tidy up by filling storage containers – look at more. 	Develop understanding of negation more another all a lot a bit some one two three four five big small same many
0 – 3 years (16–26 months)	To consistently choose the larger of two groups (or more).	<ul style="list-style-type: none"> • Hide objects in the sand – pupils scoop up the objects and identify who has the larger group or more. • Children match picture cards and show which cards has the larger group on it or more. • Play the water/sand game. Children roll a die (they have a set number of turns). They count the dots and put that many cups of water/sand in a container. They then compare the two containers showing which person has the larger amount or more and is the winner. • Play treasure hunts in pairs. Pupils hunt specific items relating to class topics or what motivates them. Who has collected the larger amount or more? • Ask children to collect equipment (PE, art, Music) or ingredients (cooking) encouraging them to select the larger of two groups. 	

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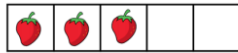
<p>0 – 3 years (22-36 months)</p>	<p>To indicate 'more' using signs/symbols/words.</p> <p>To consistently choose the smaller of two groups (or less)</p> <p>To indicate 'less' using signs/symbols/words.</p> <p>To compare two groups indicating when they are the same using signs/symbols/words</p>	<ul style="list-style-type: none"> • On actions that motivate pupils ask if they would like more. Give prompts for the child to sign or say so that the action/activity can continue. • Use motivating activities to encourage the use of more e.g. snow spray, bubbles, bouncing balls, Lego, 'The Bucket' etc. • Present the child with plates or containers of motivating items (one with a lot, the other with only a little). Pupil indicates which has more (label it). • On school trips look at different objects around you (in a farm – animals, in a park – trees). Encourage the pupil to indicate where or which has more. • Look around the school and identify more e.g. more girls or boys, blue or red mats/spots. • During fruit and drink encourage children to ask for more. <p>Repeat activities as suggested for choosing larger groups or more but using less or smaller groups</p> <ul style="list-style-type: none"> • In fruit and drink time encourage pupils to indicate who has less fruit or drink. • Provide pupils with items to complete an activity e.g. in art. Ask them if they would like more or less of something. Demonstrate how less relates to taking away. <ul style="list-style-type: none"> • When giving out items for activities such as art or PE or cooking or snack encourage children to indicate who has the same amount. • At the end of games, who has the same amount of tokens, coins, tally or cards? • Repeat activities above but highlighting when amounts are the same around the school or on trips or when playing the water/sand game. • Matching cubes or raisins or other motivating objects to dot patterns on large dice or quantity patterns or large playing cards or Numicon shapes and indicate that they are the same. 	<p>any no more as much as few fewest less number take away bigger smaller add join before after how many Number names beyond 5</p>
<p>3- 4 years (30-50 months)</p>	<p>One more within five</p>	<ul style="list-style-type: none"> • Encourage the children to use their counting and comparing skills to find one more than numbers to 5. Encourage children to use a five frame to represent numbers and then make one more. Books to read: The Gingerbread Man, The Enormous Turnip, The Very Hungry Caterpillar, Maisy Goes Camping by Lucy Cousins • Take 2 paper plates and make a cut from the edge of the centre of each plate. One one plate, draw five dots or stick five stickers round the edge of the plate, evenly spaced. Put the plate over the top of the dot plate by sliding them together. <div style="display: flex; align-items: center; margin-top: 10px;">  <p>Ask the children, can you show me two? Can you show me one more than two? Can you show me one more than four? Make a number and ask your partner to make one more.</p> </div>	

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One less with five


To respond to add 1 more and take 1 away

- Ask children to make a number on a five frame. Can you how me one more? Use a number track underneath the five frame. Can you point to the number you made? Can you point to one more than that number?



- Create a bus route around the outdoor area. Start with a driver on the bus and have different bus stops around the route. Bus driver to drive around and get one more passenger on the bus. How many each time?
- Children to also build using lego or bricks. Can they build a tower with 1 more brick?

- Children use their counting and comparing skills to find one less than numbers up to 5. Encourage children to use a five frame to represent numbers and then make one less. Children should see the link that one less than a number is the next number they say when counting backwards. Books to read: Five Little Speckled Frogs, Five Currant Buns, Five Little Ducks by Denise Fleming, Five Tiddly Widdly Tadpoles by Debbie Tarbett, Five Little Monkeys jumping on the bed by Eillen Christelow

- Use the dotted plates and five frame activity from one more to also do one less
- Use the songs and stories suggested to tole play the story with the children e.g Five currant buns
 How many buns are there altogether? Put the penny in the pot, how many pennies do we have? How many buns do we have now? Repeat the song and questions highlighting that there is one less bun each time but one more penny.

- Play a game of musical chairs with a group of 5 children. Start with 5 chairs. What happens rach time the music stops? How many chairs do we have now? Are there enough chairs for each person? Each time the music stop, ask the children to say how many chairs are left.



- Clap four times, ask the children can you clap one less time? Repeat the activity with different actions e.g. hopping, jumping, tapping their head.
- Count out objects in a line, then 'add one' or 'take one' on request. How many now? Repeat in a range of situations e.g. snack, giving resources to peers, giving out equipment in music or PE.
- During a range of construction activities such as building towers with Lego or multilink encourage pupils to 'add one more' or 'take one away' and count how many they have now.
- During a range of small world play encourage the children to 'add one more' or 'take one' e.g. car to a garage, animal to the zoo.


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		<ul style="list-style-type: none"> • During water play encourage children to ‘add one more’ or ‘take one’ object to or from the water and identify how many there are now. • During cooking ask children to ‘add one more’ ingredient. • In music encourage children to blow, hit, bang instruments ‘one more time’. How many times have they done it? Repeat for other activities in other subjects such as PE (one more jump). • Play games where tokens are won or lost and encourage pupils to ‘add one more’ or ‘take one’ from their winnings. • Model recording answers for pupils when ‘add one’ or ‘taking one’ so they can see the answers getting bigger and smaller. • During counting songs/raps encourage the children to ‘add one more’ or ‘take one’ accordingly. Use age appropriate songs and motivating items. 	
<p>Reception (40-60 months)</p>	<p>To separate groups of 3 or 4 objects in different ways</p> <p>To begin to relate addition to combining 2 groups of objects and subtraction as taking away</p>	<ul style="list-style-type: none"> • Use coloured shaker eggs and arrange them in different ways in egg boxes e.g. 2 blue shakers, 1 red and 1 yellow. • Make towers in coloured cubes or Lego show how different patterns/groups can be made e.g. 2 blue cubes and 2 red cubes or 1 blue, 1 red cube and 2 yellow cubes. • Separate ingredients in cooking into groups e.g. 1 raisin in 1 cake, 2 in the next and then 1 in the last. • Sharing objects between friends in order to complete different activities. • Giving out 4 symbols for the visual time table to different numbers of children e.g. 4, 3 or 2 children. • Record the findings to highlight the different ways of separating groups. • Use practical story problems with motivating items that are age appropriate to encourage children to combine 2 groups when adding objects and take away when subtracting. • Repeat activities above for combining 2 groups relating it to signs, symbols and language of addition (add, more, again). • Use practical experiences where items are used up (fruit and cooking time), spending (visiting shops or shop role play) and losing (games that involve losing from a given starting total). • Lift the Bowl – have a set amount of objects. Ask the children to count them and put them under a bowl. Get the children to remove a given number and put them on the bowl – look at the combination e.g. 2 and 3 is 5. Highlight the language of addition. Use for subtraction e.g. 5 take away 2 leaves 3. • Ring the Bell – each child has a set of objects. Ring a bell an arbitrary number of times and turn over a card. If it shows add (+ and symbol) children add that many number of objects, if it shows take away (– and symbol) they take them away. Emphasise the language and how the children are combining or taking way (children will need to count what they can hear before attempting this activity). 	

Mathematics – **Number:** Addition and Subtraction

To know a bigger number is made up of smaller numbers

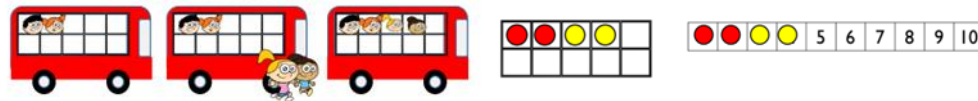
Introducing Zero

- Subtraction Race – children work in pairs. They build two cube trains of equal length. Then they take turns rolling a die and breaking off the number of cubes from their train shown on the die. The first child to get to zero determines the length of the train for the next game.
 - Use computer software such as Percy Teaches Maths to add and subtract objects.
 - The Hand Game – children work together in small groups separating a given quantity of objects (use motivating/age appropriate objects) in different ways and indicating the combinations that result. For example, 'take 4 beans, put 3 in one hand and 1 in the other'. Give different directions to the different children. Children take it in turns to open their hands and reveal their combinations say what they have and what the total is. Include zero. Combine children's hands so that bigger number can be split into lots of smaller numbers. This will provide a visual support.
 - Record the findings to highlight the different ways of separating groups. Demonstrate that bigger numbers are made up of smaller numbers.
 - Use Numicon Shapes to fit smaller numbers into bigger numbers. Look at the combinations.
 - Children learn that the number name zero and the symbol 0 can be used to represent 0 using real objects and mathematical equipment. Number songs which count back also help to develop the understanding that 0 is one less than one e.g. 5 little men in a flying saucer, 5 little ducks, 10 in a bed.
 - Use popular counting back songs such as 5 Currant Buns to show one less each time. Encourage the children to represent the buns in each verse with counters on a 5 frame and display the numerals 5, 4, 3 etc. Ask them to predict how many buns will be left as each one is bought. What about when the last bun is bought? How could we show this on our 5 frame? Which numeral should we use?
 - Provide examples which contract familiar numbers with 0 to support the children's understanding that 0 represents the absence of something e.g. How many apples on each tree? How many people on each bus? Which field has 0 horses?
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- Encourage the children to represent numbers including 0 using a variety of real objects and equipment: Show me 3 fingers, show me 5, show me 0. Show me 4 apples in the basket, show me 2, show me 0. Show me 4 clasp, one clap, 0 claps.
 - Provide a range of loose parts and labelled pots including 0 for the children to count items into.
 - Provide children with picture cards to represent different quantities including zero can also be sorted and matched to numerals.

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To be able to add more to a group of objects

- Have a bag containing numerals from 0-5. As you pull out a number a numeral combine it with task for the children to do. For example, if you pull out a 2, the children could take 2 giant strides or 2 tiptoes, do 2 jumps, run to the hoop and back twice, find 2 pebbles and bring them back etc
- Children should use real objects to see that the quantity of a group can be changed by adding more. Use the first, then, now structure to create mathematical stories. At first, children may need to re-count all of the items to see how many they have altogether e.g. 1, 2, 3, 4, **5, 6, 7**. When they are ready, encourage them to count on e.g. 4, **5, 6, 7**. They can represent the number stories using 10 frames, number tracks and their fingers.
- Play games where they count on from different starting points. Begin by counting as you point to yourself. When you point to the children they continue the count e.g. 1, 2, **3,4**, 5,6 **7,8** or 1,2,3 **4,5,6** 7,8,9 etc
- Use first, then, now to tell simple maths stories to practise adding more in real life contexts e.g. first there were 2 people on the bus. Then 2 more people got on the bus. Now there are 4 people on the bus.

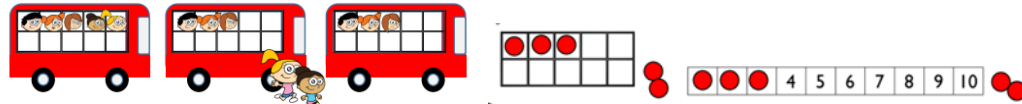


To be able to take away from a group of objects

- Share the story Mr Grumpy's Outing by John Bruningham. Ask the children to build a boat and to create their own first, then, now stories as different groups of characters climb aboard. Encourage the children to count how many altogether as more children join them.
- Provide number tracks and a 1-3 dice. The children take turns to roll the die and count on 1,2 or 3. The first to reach 10 wins the game. It may be easier for children to fill the track by adding counters rather than to 'jump' a counter along a track at this stage.
- The children take turns to roll a 1-3 dice and collect 1, 2 or 3 cubes or bricks to add to their tower. If they are ready, encourage them to count on as they add their cubes each time. How high can they build their towers before they topple?
- The children use real objects to see the quantity of a group can be changed by taking items away. The first, then now structure can be used. Encourage the children to count out all of the items at the start, take away the required amount practically, and recount to see how many left. Children can also represent the number stories using 10 frames, number tracks and their fingers.
- Use first then now to tell simple maths stories to practise taking away in familiar contexts e.g. First there were 5 people on the bus. Then 2 people got off the bus. Now there are 3 people on the bus.



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- Provide plenty of opportunities for children to practise counting back e.g. I count, you count.
- Encourage the children to adapt and re-enact favourite rhymes such as 10 green bottles by making 1, 2, 3 fall of each time or 5 currant buns, by asking children to buy 2 or 3 each time. Prompt children by asking how many left?
- Play Pass it on. Each children starts with 6 cubes. They roll a 1-3 dice and pass the corresponding number of cubes to the person on their left. The winner is the first person to give away all their cubes. Encourage children to count how many they as left as they pass on their cubes.



- Create countdown game by having number 10-0 leading towards a rocket. Provide a 1-3 dice. The children roll the dice and jump from 10 to 0. First to reach the rocket shouts blast off to win the game.

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Area	Objectives	Suggested Activities	Vocab
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Cross-curricular links

- PE** – add up scores of objects in different hoops/buckets e.g. put numbers on buckets. If the child hits the bucket they get the number on it, if they get the ball in they double the number and in their next turn they have to add the points on.
- DT** – add measurements for making products e.g. how much ribbon is needed to go round a gift box by measuring each face on the box.
- Science** – add measurements taken in investigations e.g. height of plants or look at differences, changes in temperature and so on.
- PSHE** – use addition and subtraction of larger numbers when using role play jobs.
- History** – when looking at battles compare the size of armies or fleets of ships. Compare the duration of historical periods by adding or finding the difference.
- Geography** – look at differences of water consumption or temperatures in countries or population sizes.
- ICT** –use computer activities such as MathBase and Education City. Look combining steps in programming.
- Cooking** – look at amounts of ingredients and how much more is needed. Highlight how addition can be done in any order as it does not change the end result. Look at times of cooking – how much longer?

<p>Further Addition and Subtraction Skills</p> <p>Bridging 1</p>	<p>To identify a number that is 1 more/1 less or 1 before/after a given number</p>	<ul style="list-style-type: none"> • Use number tracks and lines to count on and back identifying numbers that are one more/less or one before/after a given number. • Make number tracks with Numicon Shapes to model how numbers increase and decrease by one each time. • Count on and back one on number tracks encouraging pupils to say the number before or after – use blank die labelled with more/less or before/after. • Play active games – using a large number track (could draw one with chalk on the playground) say “place a ball on the number 1 more than..., 1 less than..., after..., before... “Time children placing the balls. Can they beat their times or each other’s? • Children physically walk up and down number tracks including large Numicon Shapes (PE cupboard) identify the number 1 more/less or before/after a given number. • Gradually reduce visual support during activities and games but reveal answer and why. • Use computer activities such as MathBase 2. 	<p>same more number facts bond count on more than add take away minus plus enough</p>
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Mathematics – **Number:** Addition and Subtraction

To be aware that to find the total of two groups they must all be counted

To know that a number can be partitioned into 2 or more parts.

To use practical equipment to find number bonds to 5

- Introduce finding ‘how many altogether?’ through practical experiences such as:
 - Making sets in two containers and then combining them and counting to find the total.
 - That five fingers on each hand makes a total of ten fingers altogether.
 - Check the total of two groups of ingredients.
 - Collect items on a walk and combine a pair of pupils’ collections.
- Played paired games where children combine their winnings by counting e.g. treasure hunts, balls in baskets/hoops, collecting tokens.
- Play games such as ‘Hungry Hippos’. Children place the balls they have won on their first turn in a container. They add the balls they have won on the second turn and count to find how many they have altogether.
- Tell story problems using motivating items and characters – children collect two groups of objects in the story and count them to find the total or how many altogether.

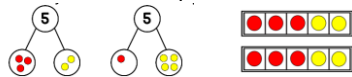
- Children will be introduced to the part-whole model to show the concept of portioning a number.
- Complete the part whole models by drawing counters and then writing the numerals



- Use part-whole models to combine group of objects up to 6. You can use numbers or counters/objects.

- Children begin to understand that numbers can be made by combining smaller numbers, including zero. They use real-life objects and familiar contexts to explore the composition of numbers to 5. The 5 frame and part-whole models are useful to represent the different parts which combine the whole. Give the children 5 bean bags. Ask them to throw them into a hoop. How many land inside the hoop? How many land outside the hoop? How can you record your results? What if they only had 4 bean bags? 3 bean bags? This activity can be repeated with skittles and a ball/balls and a basket etc

- Use a 5 frame or part whole models to show different combination of numbers to 5.



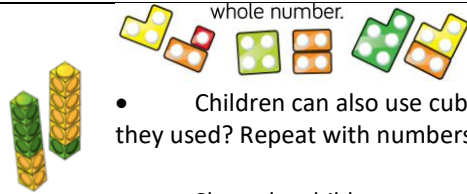
- Use songs: 5 little Speckled frogs’ song. Little ducks and 2 pools. Set up a log and a pool and provide the children with 5 speckled frogs and re-enact the song. Encourage the children to sing the song as they play and to count how many frogs are on the log and in the pool at the end of each verse.



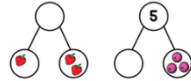
- Use the number shapes to investigate which smaller numbers combine to make exactly 2, 3, 4, or 5. Check by sitting them on top of the whole number. Is there more than one combination? Which has the most combinations?

differenc
e
taking
losing
gaining
receiving
having
missing
winning
less
less than
equal
unequal
addition
subtraction
on
order
inverse
digit
ones
tens
hundred
s
partition

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- Children can also use cubes of 2 different colours to make a tower of 5. How many of each colour have they used? Repeat with numbers 2, 3 and 4.
- Show the children a part-whole model with either one of the parts or the whole missing. Encourage the children to use concrete objects e.g. numicon to help them explain how they know what is missing.



Bridging 2

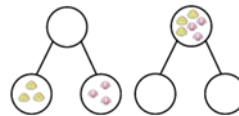
To be able to combine 2 groups

- Children begin to combine 2 groups to find how many altogether. They should be given opportunities to do this in many contexts using real objects. Encourage the children to subitize where possible although they may need to count in ones to find how many altogether. A part-whole model could be used to show the relationship between the parts and the whole. Children can also play some simple board game e.g. snakes and ladders or Hope Maths games using 2 dice. How many spaces can you move altogether.
- Using the sorting objects e.g. compare bears, have 2 different coloured groups of objects or sets of objects. Ask how many are red? How many are yellow? How many altogether?
- Provide a picture or a small world scene which provide opportunities or combining 2 groups



What can you see in the picture? How many big fish can you see? How many small fish? How many altogether? How many yellow shells? How many pink shells? How many altogether?

- Use part whole models:



- Provide a coat hanger and a basket of up to 10 pegs. Ask the children to put the hanger and to explore how their number can be partitioned in different recombed to see how many altogether.



the pegs onto ways and

- During snack time, explain there are 2 choices for snack. Choose 2 of the groups to be the waiters and ask the children what everyone would like. How many children are there? Do they have the right number of snacks altogether?
- Children should also continue using numicon and counters to combine sets of objects.

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To find how many left by taking some away from a group.

- Children are introduced to the language of subtraction rather than the subtraction symbols being explored straight away. The use of zero is also important so children know that when nothing is taken away, the whole remains the same. First, then, now story representations can help the children understand the concept of 'how many left'.
- There were 7 birds in a tree and 3 flew away. Complete the sentences:



At first there were ___ birds. Then ___ flew away. Now there are ___ birds in the tree.

Repeat with other numbers and other representations e.g. frogs on lily pads, bees on a flower, cars in a car park etc.

- Complete the sentences to create a story and draw a part-whole model. First there were ___ apples. Then ___ were eaten. Now there are ___ apples.



Repeat with other numbers and representations e.g. slices of cake or pizza, sweets in a sweet shop etc.

Bridging 3

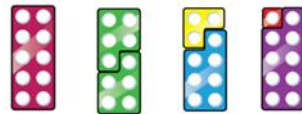
To use objects to find number bonds to 10

- The children explore number bonds to 10 using a 10 frame. Children can also use different representation such as fingers, number shapes or bead strings to explore the bonds to 10.
- Ask the children to explore different ways of building 10 on the 10 frames using counters, cubes or any loose parts with 2 distinct groups.



You could also partly fill up a 10 frame and ask how many more items are needed to make a whole 10. Encourage the children to use the empty spaces to help them see how many more are needed.

- Provide each child with a number 10 numicon shape. How many ways can they build a new 10 on top by combining 2 different number shapes?



Place one of each shape of the numicon 1-10 into a feely bag and have one of each on display for the children to see. Ask a child to draw out one shape from the bag. Can they represent this on their 10 frame and see which other numicon shape they need to collect to make 10?

- Play number bond 10 frame memory game. You will need some ten frame cards showing 1-10. Place the cards upside down. The children take turns to turn over 2 cards. When they find a pair which add to 10, they keep the cards. The player who collects the most pairs wins.

Mathematics – **Number:** Addition and Subtraction

To solve addition by counting on using fingers, Numicon, mentally and extending to number lines.

To know and use the addition symbol (+)

To know addition and fact families to 10

- Place 10 chairs into 5 rows of 2 to resemble the seats on a bus. Ask: How many passengers are there on the bus? How many passengers are there on the bus? How many more passengers can take a ride on the bus? Get some children off the bus.
- Have a tray full of sorting objects, coloured counters etc. and a blank 10 frame. Make sure there are 20 of each item. Ask the children to pick one of the sorting items to collect e.g. apples. As the children find the items, they put them onto the 10 frame. Prompt the children to use the 10 frame to help them see how many they have found and how many they still need to look for.

- Put coins in a purse, children remember how many coins are in the purse and count on the remainder they are given.
- Put some objects under a pot for children to remember. They count on the ones on top.
- Children hold objects in their hand remembering how many. They count on the extra needed.
- Re-introduce number lines modelling how they work. Use a variety of number lines including Numicon.
- Link above activities to real life story problems e.g. John has six sweets in his hand. He is given 3 more. How many does he have?

- Children should be introduced to the addition symbols at this stage. They combine it with the equal (=) symbols to create their first number sentences e.g. $3+2=5$. Continue using First, then, now stories to help them understand number sentences.
- Here are some counters. Group the counters by colour. Fill in the gaps in the sentence and say it loud. _____ red counters plus _____ yellow counters is equal to _____ counters. Complete the whole part model and the number sentence.



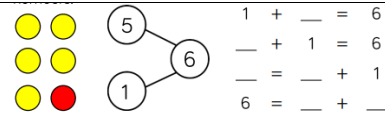
- Use cubes or numicon shapes to solve the following calculations

$$5 + 3 = \square$$

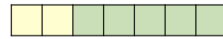
$$8 + 1 = \square$$

- Children continue to build on initial number sentences by looking at addition fact families. They can see that the order of an addition sentence can be varied, and they begin to discover that addition is commutative e.g. $3+2=5$ and $2+3=5$, $5=3+3$ and $5=2+3$
- Use the counters and the part whole model to fill in the missing numbers

Mathematics – **Number:** Addition and Subtraction



- Complete the number sentence

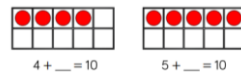


$_ + _ = 7$ $7 = _ + _$
 $_ + _ = 7$ $7 = _ + _$

To know number bonds within 10

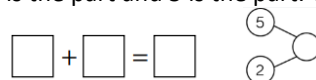
To know number bonds to 10

- Children combine their knowledge of the part-whole model and addition facts to explore number bonds within 10. Starting with then whole, children break numbers into parts and explore how many different ways a number can be partitioned e.g. $5=3+2$, $5=4+1$ etc
- Using 5 cubes, ask the children to break them apart in different ways to find all the number bonds to 5. Repeat this with up to 10 cubes. Children can also show their findings on a part whole model.
- Children can use a variety of representations to explore number bonds to 10 e.g. ten frames, bead strings, fingers. The children should also see the number sentence alongside the representation to help further develop their conceptual understanding.
- Amir shows a number on his fingers e.g. 6. How many more fingers are needed to make 10? What would this look like as a number sentence?
- Use the ten frames to complete the number bonds to 10. Can you use ten frames to show all of the number bonds to 10?

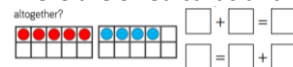


To be able to add together groups of numbers and record number sentences.

- All of the ladybirds should have 10 spots. Some of the ladybirds have lost their spots. Complete the spots and write the number sentences.
- Have a shop set up with different items costing between 1-9p. Ask the children to select 2 items that will cost 10p. Children write their number sentences or use part whole models to show their answer.
- Continue using the part whole model with the children to understand the concept of addition. They should be accurately using the + and + symbols. Children should also be familiar with the language for addition such as 'total' and 'altogether'.
- Is 2 is the part and 5 is the part. What is the whole? Repeat with other numbers to 10.



- There are 5 red cards and 4 blue cars. How many cars altogether? Repeat with other numbers.

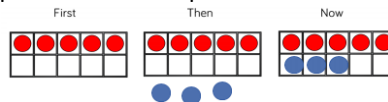



- Complete the table to represent the owls. Repeat with other amounts and animals/transport.

Mathematics – Number: Addition and Subtraction

To be able to do addition by counting on

- Children should move on from counting all to counting on. Children should be exposed to calculations given to them in a different order, for example, the smallest number first. This will help them understand that addition can be done in any order. Continue to use concrete and pictorial representations to support the children's conceptual understanding. Children can use number lines to help them.
- How many tractors are there in total? There are ___ tractors. $6 + \underline{\quad} = \underline{\quad}$
- There are 3 aeroplanes at the airport. 5 more aeroplanes land. How many aeroplanes are there now? Now there are ___ aeroplanes altogether. How can this be represented as a number sentence?
- There are four pennies in a bag. I add two more. How many pennies do I have now? There are ___ pennies. Write this as a number sentence.
- Once children become more confident, they can start counting on without number lines and using objects/fingers.
- Children by now should begin to understand that addition is commutative and that it is more efficient to start from the largest number. It is important that children see that they are not just adding two separate numbers or items, they are adding to what they already have. Ensure children do not include their start number when counting on.
- Use ten frames to complete the number story. First there were ___ cars in the car park. Then ___ more cars parked in the car park. Now there are ___ cars in the car park.



- Ava has 13 prize tokens. She wins 5 more. How many prize tokens does Ava have now?

- Mo starts at 9 and counts on 6. $9 + 6 = \underline{\quad}$. Show this calculation on a number line.
- Once children understand the concept of taking away, the subtraction symbols can be introduced. It is still important for children to create stories about the calculation and use concrete and pictorial representations so they can deepen their understanding of subtraction.
- Complete the number sentence and the create a story to represent the calculation:

Mathematics – Number: Addition and Subtraction

To know the subtraction symbol(-)



$7 - 2 = \underline{\quad}$

Repeat with other calculation and numbers

- Tom has 9 toy cars. He gives 5 of them away How many does he have left?
have left?

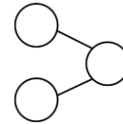
$\square - \square = \square$



Repeat with other numbers/calculations and representations.

- At first there were 10 bananas. 7 of them were eaten. How many bananas are left? Use counters/cubes to help you solve and complete:

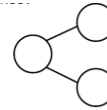
$\square - \square = \square$



- Once children are familiar with using the subtraction symbols, they are then introduced to subtraction by partitioning. Children should break apart a number into two parts using concrete and pictorial representations to support.
- How many ice creams do not have flakes? Repeat with other foods e.g. how many buns do not have cherries on top? How many drinks do not have straws etc.



$6 - 2 = \underline{\quad}$

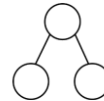


There are ice creams that do not have flakes.

- There are 9 party hats altogether. 4 of them are read. The rest are blue. How many are blue?



$\underline{\quad} = 9 - 4$



There are blue party hats.

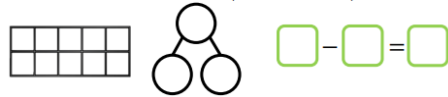
- Children build on the language of subtraction, recognising and using the subtraction symbols within 20. Children should continue to use the part-whole model alongside practical equipment to reinforce number bonds within 20.
- There are 16 biscuit on a plate. Mo eats 5 of them. Complete the sentences. First there were biscuits. Then were eaten. Now there are biscuits. $16 - 5 = \underline{\quad}$

First	Then	Now

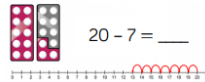
- First there were 9 sheep. Then they all ran away. How many sheep are left? Use ten frames and counters to represent the sheep.

To use the subtraction symbols (-) to subtract within 20

Mathematics – **Number:** Addition and Subtraction



- Use numicon and the number line to complete the number sentences. Use this method to calculate: 20-8, 18-6, 19-4 etc.

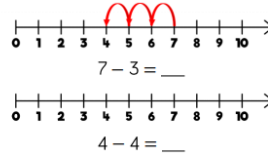


Milestone 1

To be able to count backwards to take away

To find the numerical difference.

- Children count backwards to subtract. Be aware of common misconceptions e.g. children including the starting number when counting e.g. 5-3; 5, 4, 3 etc and getting to the wrong answer. It is vital to model how to count backwards by ‘putting the start number in our head and counting backwards’ or circling the number we do not count on the number line/track.



- Children explore finding the difference as a form of subtraction. Children could use their skills of counting back and counting on to help them find the difference. Alternatively, they can make both amounts and visually see how many more/less a number is.
- How many more cakes does Whitney have than teddy? Whitney has ___ more cakes than teddy.
 - Whitney
 - Teddy
- What’s the difference between 10 and 6? The difference between 10 and 6 is _____. 10-6=_____
- Jane has 7 sweets and Mo has 3 sweets. How many more sweets does Jane have? How can you show this using cubes or counters? Jane has ___ more sweets than Mo. The difference between 7 and 3 is _____. 7-3 = _____
- Use a range of visual stimulus to show numerical differences e.g. Numicon Shapes or towers of cubes.
- Have questions relating to real objects e.g. sheep in different fields what is the difference? Make it possible for children to line up the objects so that they can identify the difference visually.
- Use problem solving activity on NRICH website ‘Find the Difference’.
- Use computer activities such as MathBase 6.

- Treasure hunt – hide signs in sand/pasta and children find and name them.
- Put up big signs in the hall/playground. Call out the name of a sign. Children run to the correct sign. Vary the language for each sign depending on ability e.g. add, plus, more.

Mathematics – **Number:** Addition and Subtraction

To recognise, write and interpret number sentences involving addition (+), subtraction (-) and equals (=) signs.

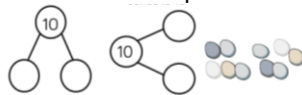
To solve problems involving missing numbers.

To know number bonds to 10

- Play board games with spaces that have add or subtract signs and number on it. Children add or subtract that number on the space. Alternatively children roll a die to see how many they should add or subtract. The winner is the first to get to the end. See Bus Stop game as well.
- Using blank die write on the words for addition and subtraction. Children roll word die as well as a number die. They create and record number sentences using signs.
- ‘Show me’ – give a word for addition/subtraction depending on ability and understanding. Children record the sign on their whiteboards.
- Tell story problems (use objects for visual support) e.g. John has 3 apples. Sally gives him 3 more. How many does he have altogether? Children record the number sentence.
- Use maths activities such as MathBase 1, 2 and 6. Also, Percy Teaches Maths and Tux Maths.

- Use number cards and signs to create number sentences for children to rearrange to find missing numbers (alternatively use Post-it notes).
- Numicon Shapes and balance scales (practical and computer software) to identify missing numbers.
- Children wear number bibs and rearrange themselves to find missing numbers.
- Play quick fire games as in Objective 6 in order to develop mental recall skills.
- Use story problems (with objects if needed). Children record the number sentence and identify what is missing. Sorties can be made age appropriate e.g. John’s CD shelf holds 26 CDs. He has 12 in it. How many more does he need? $12 + \quad = 26$ (older children). Or John’s sticker chart has 16 squares. He has 5 stickers, how many more does he need to finish his chart? $5 + \quad = 16$ (younger children). Vary the size of numbers depending on ability.
- Use computer activities such as Tux Maths and MathBase 2.

- Children can use the part-whole model to continue exploring number bonds to 10. Number bonds to 10 can also be explored through outdoor games such as skittles or songs such as 10 green bottles.
- Provide whole part models and a selection of loose parts. Ask the children to count out 10 loose parts into their part-whole model. Explore the different ways they can show pairs of number bond to 10.
- Provide children with a selection of beads and string. Encourage them to make their own bead strings using 10 beads. Ask them to split the beads to how number bond s to 10. Record their different ways on a part-whole model.
- Hide some bead in your hand and show the rest on the string. Can they work out how many you are hiding? Show results on a part-whole model.



- Children see that working systematically helps them find all the possible number bonds to 20. They will use their knowledge of number bonds to 10 to find number bonds to 20. Using examples such as $7+3$, $17+3$ or $7 + 13$

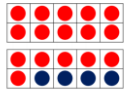
Mathematics – **Number:** Addition and Subtraction

encourages children to see the link between bonds to 10 and bonds to 20 and reinforces their understanding of place value.

- What number bond is represented in the pictures?

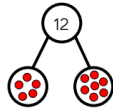


There are ___ red counters.
There are ___ blue counters.
Altogether there are ___ counters.
___ + ___ = ___ ___ + ___ = ___



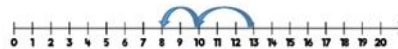
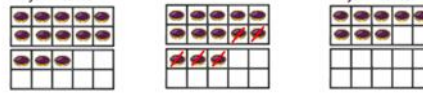
There are ___ red counters.
There are ___ blue counters.
Altogether there are ___ counters.
___ + ___ = ___
___ + ___ = ___

- Continue the pattern to find all the number bonds to 12. How do you know when you have found them all? Repeat with other numbers.



12 = 12 + 0
12 = 11 + ___
12 = 10 + ___

- Children should be encouraged to partition to make ten. They should represent this using concrete manipulatives or pictorially to begin with. Ten frames and number lines are particularly useful to model the structure of this strategy.
- First there were 13 jam tarts. Then 5 were eaten. Now there are 8 jam tarts



Repeat with other numbers.

- Children will also need to find the differences where they subtract to calculate how many more.
- Complete the number sentences to describe what happens to the sweets. First there were ___ sweets. Then ___ sweets were eaten. Now there are ___ sweets.

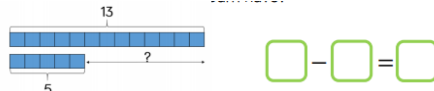


- There are 12 cars in the car park. 5 of them are blue. How many are red?



□ - □ = □ ___ cars are red.

- Adam has 13 playing cards. Oliver has 5 playing cards. How many more playing cards does Adam have?



To know and represent number bonds and related subtraction facts to 20.

To be able to subtract one digit and two-digit number to 20, including 0.

Mathematics – **Number:** Addition and Subtraction

Milestone 2

To be able to add and subtract 1s

- Children should start seeing the pattern when we add and subtract 1 and comment upon what happens. This is the step before finding ten more than or ten less than, as bridging should beyond 10 should not be attempted yet. The pattern should be highlighted also by adding 2 (by adding another one) and then adding 3.
- Create sentences based on the picture



Example
There are 4 children playing in a park.
One more child joins them so there will be 5 children playing together.

- Continue the number tracks below:

31				34		
----	--	--	--	----	--	--

		45			48
--	--	----	--	--	----

				67	
--	--	--	--	----	--

	13				
--	----	--	--	--	--

To know 10 more and 10 less

- When teaching this, you will need to focus on the tens digit. Using a 100 square, explore with the children what happens to the numbers in the columns. You should draw attention to the idea that the tens digit changes while the ones digit remain the same. Children will need to see how the number changes with concrete materials before moving onto more abstract ideas.
- Continue the number tracks below:

10	20	30			
----	----	----	--	--	--

		35	45	55		
--	--	----	----	----	--	--

- Using a 100 square, circle the number that is 10 more than 27. Circle the number that is 10 less than 27. Repeat in different colours for different numbers. What do you notice?
- Use concrete materials, complete the missing boxes:

10 less	Number	10 more
2	12	22
	37	


To add and subtract 10s

- Children should make use of place value to add and subtract 10s from a given number within 100. Emphasise the importance of the tens digit within the given numbers e.g $64 + 20 = 84$
- Continue the number track by adding 20 each time:

23				
----	--	--	--	--

- Use the place value charts and concrete materials to complete the calculations:

Mathematics – Number: Addition and Subtraction

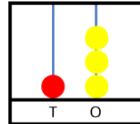
Tens	Ones
	
	

$$\begin{array}{r} 23 \\ +40 \\ \hline \end{array}$$

Tens	Ones
	
	

$$\begin{array}{r} 56 \\ -30 \\ \hline \end{array}$$

- This would also be a good opportunity to work on some reasoning and problems solving skills e.g.:



Tommy has three spare red beads.

What numbers could he make?
Explain your answer.

Here are Class 2's crayons.



They are given a new box of 10 each day for a week.

How many crayons do they have at the end of the week?

To know addition can be done in any order.

To know by heart pairs to 10 and then 20.

- Have groups of objects (use objects of interest) children add them together. Show how the groups can be rearranged and the answer is the same. Children investigate.
- Change the range of objects and set investigations into the order addition can be done in. Children match numerals to objects.
- Use a balance scale and Numicon Shapes showing the order numbers are put in does not change the balance. This can also be done using the Numicon Software.
- Use a range of visual support to model pairs of numbers for 10 and 20 such as Unifix cubes or Numicon Shapes.
- Play treasure hunt, hiding numerals or Numicon Shapes. Children find and make pairs to 10 or 20. Hide object in sand or outside.
- Give children numerals. They find their partner to make 10 or 20.
- Use computer activities such as Purple Mash and MathBase 1.
- Sing songs see Education City.
- Set investigations into finding all the ways to make 10 or 20.
- Children should have an understanding of calculations with similar digits. For examples, $2 + 5 = 7$, $20 + 50 = 70$. This involves both addition and subtraction. It is important to highlight the correct vocabulary and help children to notice what is the same and what is different between the number and calculations. Tens and ones should be used to aid understanding. Using Base 10 can also help the children see relationships.

Mathematics – **Number:** Addition and Subtraction

To use known facts to find related facts to 100

To know number bonds to 100 (Tens)

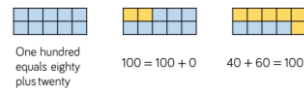
To use number bond facts to 20 to solve addition and subtraction problems mentally.

- I have 3 blue pens and 4 black pens. Altogether I have 7 pens. Tommy has 30 blue pens and 40 black pens. How many pens does he have in total? Use concrete apparatus to show your thinking.
- Complete the part-whole models:



- Find the missing numbers in the related facts.
 $5 + 4 = 9$ $8 = 3 + 5$ $4 = 10 - 6$
 $50 + 40 =$ $80 = 30 + \underline{\quad}$ $40 = \underline{\quad} - 60$

- Teaching should focus on multiples of 10 up to and within 100. Links should be made again between single digit bonds and tens bonds. Using a 10 frame to represent 100 would be a useful resource to make this link.
- Match the 10 frames to the sentences below:



- Fill in the missing numbers. Use Base 10 to represent the numbers.
 $2 + 6 = 8$ $20 + 60 =$ $2\underline{\quad} + \underline{\quad}0 = 80$ $80 = \underline{\quad}0 + 6\underline{\quad}$

- Remind children of visual support from Objective 5 in order to help them solve questions mentally.
- Use visual support and activities from Objective 5 to make sure they apply number facts for addition to subtraction.
- Give quick fire questions – link to games e.g. how many can they answer in 30 seconds/1 minute? Children compete against each other or beat their own records (link to Statistics, recording results in tables using tally marks).
- Computer games such as MathBase 1.

- Children apply their understanding of known addition facts within 20 to identify all related facts. This will include an understanding of the relationship between addition and subtraction, and knowing the purpose between addition and subtraction, and knowing the purpose of the equals sign, as well as the addition and subtraction sign. Showing the link between representations, such as part-whole models and bar models can support and deepen the children's understanding.
- One relationship shown by this part-whole model is $15 + 5 = 20$. Can you write all associated number sentences in the fact family?



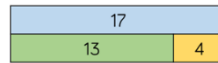
Mathematics – Number: Addition and Subtraction

To be able to recall and use addition facts for all numbers up to 20

To know addition is the inverse of subtraction.

To add 2-digit numbers to 1-digit numbers using visual support – number lines and hundred squares.

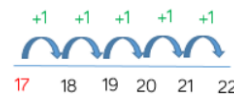
- Look at the bar model below. Can you write all of the number sentences in the fact family?



- Give number sentences with missing numbers.
- Use Numicon Shapes and a balance scale (or Numicon software) to model that addition and subtraction are the inverse. Children use their number facts to 20 to solve subtraction problems.
- Use objects of interest and rearrange them to show how addition and subtraction are the inverse of each other.
- Use sign and number cards – children rearrange them.
- Give 3 numbers and set an investigation into finding all the addition and subtraction combinations.

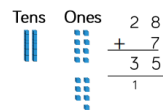
- Before crossing the 10 with addition, children need to have a strong understanding of place value. Children should know that tens ones are the same as one ten. Children also need to be able to partition two-digit numbers in order to add them. They need to understand the difference between one digit and two digit numbers and line them up in columns.

- $17 + 5 =$



Can you put the larger number in your head and count on the smaller number? Start at 17 and count on 5

- Find the total of 28 and 7:



- Partition both the numbers.
- Add together the ones.
- Have we got 10 ones?
- Exchange 10 ones for 1 ten.
- How many ones do we have?
- How many tens do we have?

- Use a variety of visual support e.g. table number lines and hundred squares, ones on the computer (Numicon software) and large ones in the hall or playground for children to physically count along.
- Use Numicon Shapes to model the counting on of single digit numbers from 2-digit numbers.
- Computer activities such as MathBase 2.

- Children also need to have a strong understanding of place value for subtraction. Children need to be able to partition two-digit numbers in order to subtract from them. They need to be able to understand the difference between one-digit and two-digit numbers and line them up in columns.

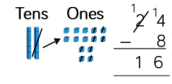
- $22 - 7 =$

Mathematics – Number: Addition and Subtraction



Can you put the larger number in your head and count back the smaller number? Start at 22 and count back 7

- Subtract 8 from 24



- Do we have enough ones to take 8 ones away?
- Exchange one ten for ten ones.
- Take away 8 ones.
- Can you write this using the column method?

To be able to subtract 1-digit from 2-digits

- This step is an important pre-requisite before children add two-digit numbers with an exchange. Make sure you focus on the language of tens and ones. Look at different ways of adding the numbers including the column method. It is important that teachers always show the children to start with the ones when adding using the column method.
- Find the sum of 34 and 23

	Tens	Ones
+	3	4
	2	3

- $64 + 12 = \underline{\quad}$
 $4 \text{ ones} + 2 \text{ ones} = \underline{\quad}$
 $6 \text{ tens} + 1 \text{ ten} = \underline{\quad}$
 $\underline{\quad} \text{ tens} + \underline{\quad} \text{ ones} = \underline{\quad}$

	Tens	Ones
+	6	4
	1	2

To add 2-digit numbers

- Mo has 41 sweets. Whitney has 55 sweets. How many sweets do they have altogether?
- Children then move on to using Base 10 and partitioning to add together 2-digit numbers including an exchange. They should be encouraged to use Base 10 alongside any recording of the formal column method.

- $64 + 17 = \underline{\quad}$
 $4 \text{ ones} + 7 \text{ ones} = \underline{\quad}$
 $6 \text{ tens} + 1 \text{ ten} = \underline{\quad}$
 $\underline{\quad} \text{ tens} + \underline{\quad} \text{ ones} = \underline{\quad}$

$$\begin{array}{r} 64 \\ + 17 \\ \hline 81 \end{array}$$

- Find the sum of 35 and 26



- Partition both the numbers.
- Add together the ones. Have we got 10 ones?
- Exchange 10 ones for 1 ten.
- How many ones do we have?
- Add together the tens. How many do we have altogether?

Mathematics – Number: Addition and Subtraction

Class 3 has 37 pencils.
Class 4 has 43 pencils.



How many pencils do they have altogether?

-

This step is an important step before children start to look at subtraction where they cross a tens boundary. Children need to use concrete materials. Adults need to ensure they model and discuss to help develop their understanding.

-

78 minus 34 = ____
8 ones – 4 ones = ____
7 tens – 3 tens = ____
We have ____ tens and ____ ones.



-

34 – 13 = ____

$$\begin{array}{r} 34 \\ -10 \\ \hline 20 \\ -3 \\ \hline 17 \end{array}$$

- Partition the number 34.
- Partition 13 and subtract the ones and the tens.
- Place the partitioned number back together.

-

Subtract 13 from 28



$$\begin{array}{r} 28 \\ -13 \\ \hline 15 \end{array}$$

-

Children use their knowledge that one ten is the same as ten ones to exchange when crossing a ten in subtraction. Continue to use concrete manipulatives (such as Base 10) and pictorial representations (such as number lines and part whole models) to develop the children's understanding.

-

Use the number line to subtract 12 from 51:

$$\begin{array}{r} \underline{\hspace{2cm}} \\ 51 \end{array}$$

-

Can you subtract the tens first and then the ones.

-

42 – 15 =

$$\begin{array}{r} 42 \\ -10 \\ \hline 32 \\ -5 \\ \hline 27 \end{array}$$

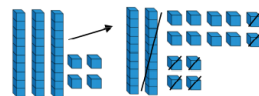
We can't subtract the ones. Can we partition differently?

$$\begin{array}{r} 42 \\ -10 \\ \hline 32 \\ -5 \\ \hline 27 \end{array}$$

Now we can subtract the ones and then subtract the tens. 42 – 15 = 27

-

Take 16 away from 34:



$$\begin{array}{r} 34 \\ -16 \\ \hline 18 \end{array}$$

-

Use Numicon 10s number line as well as hundred squares.

-

Computer activities such as Numicon, MathBase 2, Education City, Percy Teaches Maths, Percy Keeps Counting and Tux Maths.

-

Children roll die to see how many multiples of 10 to add.

To be able to subtract 2-digits

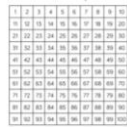
To add multiples of 10 on a hundred square.

Mathematics – **Number:** Addition and Subtraction

To know bonds to 100 (tens and ones)

- Children build on earlier work on their number bonds to 100 with tens altogether with number bonds to 10 and 20. They use their new knowledge of exchange to find the number bonds to 100 with tens and ones. Using 100 squares, Base 10, bead strings etc will help the children develop their understanding.

- Use a 100 square. If:



- 40 squares are shaded, how many are not shaded?
- 45 squares are shaded, how many are not shaded?
- 54 squares are shaded, how many are not shaded?

- Tommy is making 100 with Base 10. How much more does he need if he has:



- 5 tens and 3 ones

- 37

Children could place their Base 10 on top of a 100 piece to help them calculate.

- $25 + \underline{\quad} = 100$ $100 - 84 = \underline{\quad}$
 $\underline{\quad} + 69 = 100$ $100 - \underline{\quad} = 11$

- Making sets in three containers and then combining them and counting to find the total.
- Check the total of three groups of ingredients.
- Collect items on a walk and three pupils combine their collections.
- Played games where groups of three children combine their winnings by counting e.g. treasure hunts, balls in baskets/hoops, collecting tokens.
- Play games such as 'Hungry Hippos'. Children place the balls they have won on their first turn in a container. They add the balls they have won on the second and third turn and count to find how many they have altogether.
- Tell story problems using motivating items and characters – children collect three groups of objects in the story and count them to find the total or how many altogether.
- Use computer software such as MathBase 6.
- Count up groups of balls/bean bags in PE – throwing balls or bean bags into 3 hoops and totalling the number they got in the

To add 3 groups of objects.

- Children need to use their knowledge of commutativity to find the most efficient way to add the three one-digit numbers.

- Use ten frames and counters to add the numbers $4 + 3 + 6$



Can you add the numbers in a different way to find a number bond to 10?



$$4 + 6 = 10$$



$$10 + 3 = 13$$

- Find the totals of each row and column:

5	4	2	<input type="text"/>
3	7	8	<input type="text"/>
5	7	3	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

To add three 1-digit numbers

Mathematics – **Number:** Addition and Subtraction

To be able to use a range of strategies to check calculations

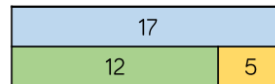
- Use $<$, $>$ or $=$ to compare the number sentences:

$5 + 4 + 6$ $6 + 5 + 4$ $7 + 3 + 8$ $7 + 7 + 3$
 $9 + 2 + 5$ $8 + 3 + 5$ $8 + 4 + 2$ $2 + 5 + 8$

- Children should be given the opportunity to discuss and share strategies for checking addition and subtraction calculations. Checking the calculations is not restricted to using the inverse. Teachers should discuss using concrete resources, number lines and estimating as part of a wide range of checking strategies.
- Use concrete objects to check and prove whether the calculations are correct:



- Can you use the inverse operations to check that $5 + 12 = 17$. How many possible inverse calculations are there?



- Ellie write this calculation: $18 - 5 = 13$. Which of the following could she use to check her work?




$13 + 5$	$13 - 5$
$18 - 13$	$5 + 13$

Milestone 3

To be able to add and subtract multiples of 100

- Children are introduced to adding number greater than 100. They will apply their prior knowledge of adding and subtracting ones and tens to adding and subtracting multiples of 100. Using concrete manipulatives and pictorial representations throughout is important so the children can see the value of the digits.

- Complete:

 2 ones and 3 ones is equal to ___ ones.
 2 tens and 3 tens is equal to ___ tens.
 2 hundreds and 3 hundreds is equal to ___ hundreds.

- Complete each box for $400 + 500$:

Draw It	Write It	Part-Whole	Number Sentence
	___ hundreds and ___ hundreds is equal to ___ hundreds		___ + ___ = ___

- Use the bar model to complete the number sentences:

600		___ + ___ = 600	600 = ___ - ___
200	400	___ + ___ = 600	600 = ___ - ___
		___ - ___ = 400	400 = ___ - ___
		___ - ___ = 200	200 = ___ - ___

Mathematics – **Number:** Addition and Subtraction

To be able to add 3 digit and 1 digit

- During this small step, children add and subtract ones from a 3-digit number without an exchange. They consider which digits are affected when adding ones. For example, if a child is completing $214 - 3$ or $214 + 3$ they see that they need to focus on the ones column only. Therefore, all they need to do is $4 - 3$ or $4 + 1$. The use of the column method can be used but mental arithmetic is the best strategy.
- Use the place value grid to complete the calculations: $214 - 3 =$ $214 + 3 =$

Hundreds	Tens	Ones

- Complete:

$356 - 5 =$
$357 - 5 =$
$358 - 5 =$
$359 - 5 =$

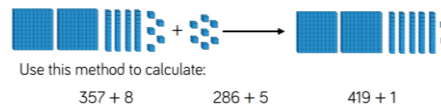
$356 - 5 =$
$356 - 4 =$
$356 - 3 =$
$356 - 2 =$

$356 - 5 =$
$366 - 5 =$
$376 - 5 =$
$386 - 5 =$

Use concrete materials.

- Jack has 534 team points and gets four more. Tommy has 534 teams points and loses four of his. How many team points does each person have? Who has the most?
- Children then move on to adding ones to a 3-digit number with an exchange. They discover that when adding ones it can affect the ones column and the tens column. Children learn that we can only hold single digits in each column, anything over must be exchanged. The use of 0 e.g. $145 - 5$ is important so they know to use zero as a place holder.

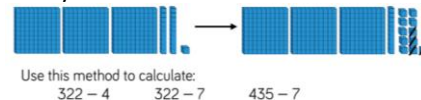
- We can use Base 10 to solve $245 + 7$:



To be able to subtract 1-digit from 3-digits

- Children subtract a 1-digit number from a 3-digit number using an exchange. Children need to be secure in the fact that 321 is 3 hundreds, 2 tens and 1 one but that it is also 3 hundreds, 1 ten and 11 ones. If children are not secure with regrouping, it is important to revisit this before subtracting.

- Teddy uses Base 10 to calculate $321 - 4$

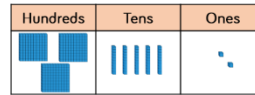


- Red team have 672 points. Blue team have 7 fewer points that red team. How many points do blue team have?

To add and subtract 3 digits and 2-digits numbers

- Children look at what happens to a 3-digit number when a multiple of 10 is added or subtracted. Different representations such as base 10, arrow cards, place value charts should be used. The use of the column method is exemplified in this example, but children should explore whether or not this is needed and explain why. Mental methods should be encouraged throughout.

Mathematics – Number: Addition and Subtraction



Use place value counters to complete the number sentences.

$$352 + 4 \text{ tens} = \underline{\quad\quad}$$

$$352 - 2 \text{ tens} = \underline{\quad\quad}$$

- Complete:

$793 - 60 =$	$793 - 60 =$	$733 + 60 =$
$793 - 70 =$	$783 - 60 =$	$723 + 60 =$
$793 - 80 =$	$773 - 60 =$	$713 + 60 =$
$793 - 90 =$	$763 - 60 =$	$703 + 60 =$

- Complete $<$, $>$ or $=$:

$$773 + 1 \quad \bigcirc \quad 773 + 10$$

$$653 + 10 \quad \bigcirc \quad 653 - 10$$

$$647 + 10 \quad \bigcirc \quad 657 - 10$$

$$721 + 10 \quad \bigcirc \quad 653 + 10$$

- Children then move onto adding multiples of 10, to a 3-digit number with an exchange. They recognise that when adding tens, it can change the tens and hundreds column. Encourage the children to count in tens rather than use column addition. Draw on knowledge of inverse to work out missing number problems.
- Mo uses Base 10 to calculate $176 + 40$



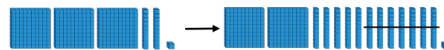
Use Mo's method to calculate:
 $276 + 40$ $266 + 40$ $266 + 70$

- Miss Wilson has 237 marbles in a box. She adds 8 more bags of 10 marbles. How many marbles does she have now? Write the calculation for this problem.
- Complete the bar models:



What do you notice?

- Children subtract multiples of 10 from a 3-digit number, with an exchange. The examples show different ways this concept could be taught using number lines and part whole models. The column method could be used, however, it is not most efficient method. Counting backwards in tens or using 100 to help will support mental calculations.
- Rosie uses Base 10 to subtract 70 from 321



$$321 - 70 = 251$$

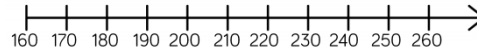
Use Rosie's method to calculate:
 $321 - 80$ $421 - 6 \text{ tens}$ $451 - 60$

To subtract 2-digits from 3-digits

Mathematics – Number: Addition and Subtraction

To be able to add and subtract 100s

- Count back in tens to solve $240 - 70$



- Children build on their knowledge of adding 100s together e.g. $300 + 500$, by adding ones and tens to solve calculations such as $234 + 500$. It is important to discuss why the column method may not be the most efficient method.
- Use the place value grid and Base 10 to help you calculate two hundred and thirty-four add three hundred.

Hundreds	Tens	Ones

- Anna has saved £675. She saved £200 more than Tommy. How much has Tommy saved?
- Children also focus on the position of numbers and place value to add and subtract 2-digit and 3-digit numbers. They represent numbers using Base 10 and line up the place value columns. Children should add numbers without an exchange.
- Use a place value grid and Base 10 to solve these calculations:

$26 + 461$

H	T	O

$553 - 32$

H	T	O

$544 + 22$

H	T	O

- Represent the calculations using Base 10 and a place value grid and solve them
 $388 - 44$ $167 + 32$ $265 - 43$

- Calculate:

$$\begin{array}{r} 365 \\ + 23 \\ \hline \end{array} \quad \begin{array}{r} 365 \\ - 23 \\ \hline \end{array} \quad \begin{array}{r} 365 \\ + 32 \\ \hline \end{array} \quad \begin{array}{r} 365 \\ - 32 \\ \hline \end{array}$$

To add 2-digit numbers and 3-digit numbers with an exchange

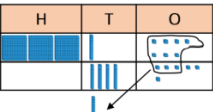
- Children begin to add numbers where there is an exchange from ones to tens before moving onto exchanging tens to hundreds before adding numbers where there are exchanges in both columns. Use concrete representations and the column method to support children in understanding how the column method works.

Mathematics – Number: Addition and Subtraction

Subtract 2-digits from 3-digits

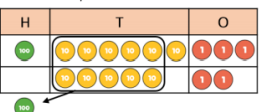
To be able to add two 3-digit numbers

- Annie uses Base 10 to calculate $317 + 46$



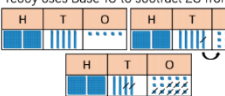
3	1	7
+	4	6
3	6	3

Use Annie's method to calculate:
 $327 + 46$ $537 + 36$ $538 + 32$ $267 + 24$
- Dexter uses place value counters to calculate $163 + 52$



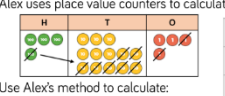
1	6	3
+	5	2
2	1	5

Use Dexter's method to calculate:
 $372 + 64$ $537 + 82$ $537 + 72$ $248 + 70$
- Children should start by exchanging one ten for ten ones. Next they exchange one hundred for ten tens before subtracting numbers where they are exchanges in both columns. Encourage children to use Base 10 and place value counters so they can physically exchange and see the link between the concrete and the written column method.
- Teddy uses Base 10 to subtract 28 from 255



2	5	5
-	2	8
2	2	7

Use Teddy's method to calculate:
 $365 - 48$ $492 - 38$ $722 - 16$
- Alex uses place value counters to calculate $434 - 72$



4	3	4
-	7	2
3	6	2

Use Alex's method to calculate:
 $248 - 67$ $247 - 67$ $354 - 92$
- Children add two 3-digit numbers with no exchange. They should focus on the on the lining up of the digits and setting the additions clearly out in columns.
- Complete the calculations:

H	T	O
300 300 300	40 40 40	5 5 5 5 5
300 300 300	40 40 40	5 5

___ + ___ = ___

H	T	O
300 300	40 40 40	5 5 5
300 300 300	40 40 40	5 5

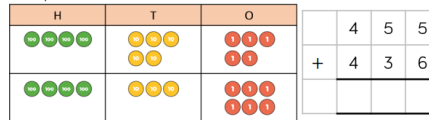
___ + ___ = ___
- Use the column method to calculate:

Three hundred and forty-five and two hundred and thirty-six
 Five hundred and sixteen plus three hundred and sixty-two
 The total of two hundred and forty-seven and four hundred and two
- Children then move onto adding 3-digit numbers with an exchange. They start by adding number where there is one exchange required before looking at questions where they need to exchange in two different columns. Children should continue to use Base 10 or place value counters and use a written method alongside the concrete.

Mathematics – Number: Addition and Subtraction

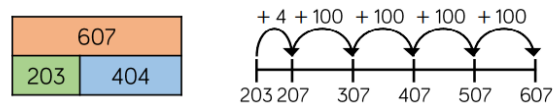
To be able to subtract 3-digits from 3-digits

- Use place value counters to calculate $455 + 436$



- Clare and Ron are playing a game. Clare scores 351 points and Ron scores 478 points. How many points do they score altogether? How many more points does Ron score than Clare?

- Children should consider different methods of subtraction such as counting on (Number lines) and using Base 10.
- We can count on using a number line to find the missing value on the bar model e.g:



Use this method to find the missing values:



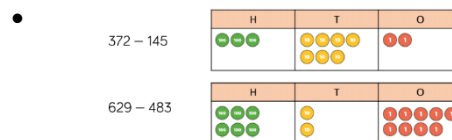
- Mo uses base 10 to subtract 142 from 373



Use Mo's method to calculate:

$565 - 154$ $565 - 145$ $565 - 165$

- Children then explore the column method using concrete manipulatives. Children progress from An exchange in one column, to an exchange in two columns. Reinforce the importance of recording any exchanges clearly in the written method.



- Complete the column subtractions showing any exchanges

	H	T	O		H	T	O		H	T	O
	6	8	3		2	3	4		5	0	7
-	2	3	4	-	1	9	5	-	4	5	1

NB Children should be encouraged to estimate and check their answers

Mathematics – Number: Addition and Subtraction

Milestone 4

To be able to add 1s, 10s, 100s and 1000s

To be able to add two 4-digit numbers

- Children build on prior learning of adding and subtracting hundreds, tens and ones by being introduced to adding and subtracting thousands. Children should use concrete representations (Base 10, place value counters) before moving onto written and mental methods.



The number represented is _____. Add 3 thousands to the number. What do you have now? Add 3 hundreds to the number. What do you have now? Subtract 3 tens from the number. What do you have now? Add 5 ones to the number. What do you have now?

- Here is a number:

Thousands	Hundreds	Tens	Ones
5	3	8	2

Add 3 thousands to the number. Subtract 4 thousands from the answer. Subtract 2 ones. Add 5 tens. What number do you have now?

- Children use their understanding of addition of 3-digit numbers to add two 4-digit numbers with no exchange. They use concrete equipment and a place value grid to support their understanding alongside column addition.
- Use counters and a place value grid to calculate $243 + 231$
- Use counters and a place value grid to calculate $3,242 + 2,213$

1,000s	100s	10s	1s

Now calculate $3,242 + 213$ in the same way. What is the same and what is different?

- Work out the missing numbers

	Th	H	T	O
	4	___	6	___
+	2	5	___	1
	___	7	8	9

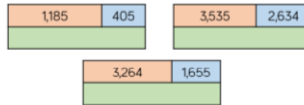
- Children then move onto adding two 4-digit numbers with one exchange. They use a place value grid to support understanding alongside column addition. They explore exchanges as they occur in different place value columns.
- Rosie uses counters to find the total of 3,356 and 2,435

Mathematics – Number: Addition and Subtraction

Th	H	T	O
3	3	5	6
+	2	4	3
5	7	9	1

Use Rosie's method to calculate:
 $3,356 + 2,437$ $3,356 + 2,473$ $3,356 + 2,743$

- Dexter buys a laptop costing £1,265 and a mobile phone costing £492. How much do the laptop and the mobile phone cost altogether?
- Complete the bar models:



- Building on adding two 4-digit numbers with one exchange, children explore multiple exchanges within an addition. Children should continue to use equipment alongside the written method.
- Use counters and a place value grid to calculate:

5	9	3	4	3	2	7	5	1	7	7	2			
+	2	2	4	6	+	6	1	5	6	+	2	2	5	0

- Find the total of 4,844 and 2,156

Th	H	T	O
4	8	4	4
+	2	1	5

- Use <, > or = to make the statements correct:

$3,456 + 789$ $1,810 + 2,436$
 $2,829 + 1,901$ $2,312 + 2,418$
 $7,542 + 1,858$ $902 + 8,496$
 $1,818 + 1,999$ $3,110 + 707$

To be able to subtract two 4-digit numbers

- Children build on their knowledge of subtracting using the formal column method to subtract two 4-digit numbers. Children start off looking at calculations with no exchanges.
- Annie uses place value counters to calculate $3,454 - 1,224$

Th	H	T	O
3	4	5	4
-	1	2	2
2	2	3	0

Use this method to calculate:

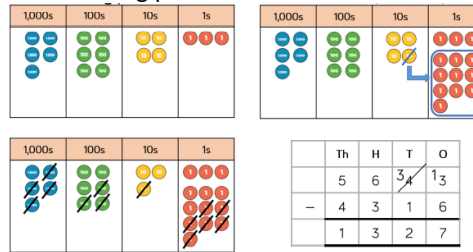
$2,348 - 235 =$ _____ $= 4,572 - 2,341$ $6,582 - 582 =$ _____ $= 7,262 - 7,151$

- Use a bar model to represent each problem.
 There are 3,597 boys and girls in a school. 2,182 are boys. How many are girls?

Mathematics – Number: Addition and Subtraction

Car A travels 7,653 miles per year. Car B travels 5,612 miles per year. How many further does Car A travel than Car B per year?

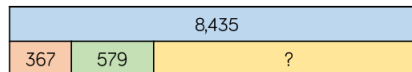
- Children then move onto using the formal column method to subtract two 4-digit numbers. Children explore subtractions where there is one exchange. They use place value counters to model the exchange and write the written method.
- Dexter is using place value counters to calculate $5,643 - 4,316$



Use Dexter's method to calculate:

$$4,721 - 3,605 = \quad 4,721 - 3,650 = \quad 4,172 - 3,650 =$$

- Dora and Mo are collecting book tokens. Dora has collected 1,452 tokens. Mo has collected 621 tokens fewer than Dora. Represent this scenario on a bar model.
- Children then move onto finding out what happens when a subtraction has more than one exchange. They can continue to use manipulatives to support their understanding. Some children may feel confident calculating with a written method.
- Use place value counters and the column method to calculate:
 $5,783 - 844$ $6,737 - 759$ $8,252 - 6,560$ $1,205 - 398$ $2,037 - 889$ $2,037 - 1,589$
- A shop has 8,435 magazines. 367 are sold in the mornings and 579 are sold in the afternoon. How many magazines are left? There are _____ magazines left.



- Find the missing 4-digit numbers:

	Th	H	T	O
	?	?	?	?
+	4	6	7	8
	7	4	3	1

NB Children should be encouraged to estimate and check their answers