Early Years Mathematics Planning By end of Spring Term

ELG

Number ELG Children at the expected level of development will: Early Adopter Handbook 13 - Have a deep understanding of number to 10, including the composition of each number; - Subitise (recognise quantities without counting) up to 5; - Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

Numerical Patterns ELG Children at the expected level of development will: - Verbally count beyond 20, recognising the pattern of the counting system; - Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity; - Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

Educational Programme

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

Number

Key vocabulary

Count
Numbers
How many
Subitise
Add/ Altogether/plus
Subtract/Take away
Double
Total/answer/equals
Sort/Match

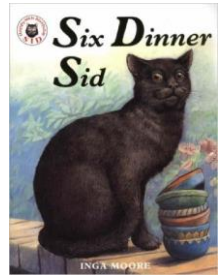
Milestone 2

- Children recognise and write numerals to 10.
- Children will subitise quantities to 5, beginning to recognise a range of irregular patterns.
- Children count out 10 objects from a larger group.
- Show up to at least 5 fingers without having to count them and up to 10 fingers with a little thought.
- Children make numbers to 10 in playful situations that use addition and subtraction, including identifying the missing number (how many more do I need to make 5?).
- Children demonstrate automatic recall for addition and subtraction number bonds to 5.
- Children begin to demonstrate automatic recall for addition and subtraction number bonds to 10.
- Children demonstrate an awareness of what a double is, can talk about how to make a double and can use concrete resources to show doubles.

Examples of activities

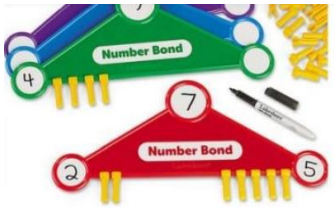
Opportunities & provocations to read and write numerals are inside and out.
Model how to keep score for games, encourage children to do it themselves.

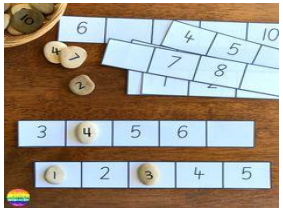
Play simple group games such as number bingo and dominoes for math lesson.



Use songs and books to do maths – how many monkeys are in the tree? What if 1 fell off? Talk about what just happened – 4 monkeys and 1 fell out means there are 3 left. Can you draw that? Begin moving from concrete to pictorial representations of the math. They may write some numbers but it is not essential – we need to them to understand the concrete to pictorial strongly.

Increase provision of simple stories with numbers for children to choose freely.
Play outdoor counting games for example, fill the bucket with objects for the given number.
Introduce sequencing number games and supporting materials for example number strips for children to fill space with missing numbers.





[25 Number Bond Activities To Help Kids Develop Number Sense (weareteachers.com)]

Numerical Patterns	**Milestone 2** • Children count forward and back within 10 using actions or sounds (things that can't be seen or moved).

Key vocabulary **Number names** **Count** **Pattern** **Pattern Rule** **More/less** **Equal** **Sort** **Forward/backward** **Sort/match**	• Rote count past 20 with a group with increasing confidence. • Children sort and compare objects and sizes using concrete resources independently choosing their own way to sort. • Children describe quantities using words such as "more" or "less" or "the same as". • Children use concrete resources to begin to recognise patterns when finding doubles and halves. • Children recognise when sharing is unfair – because that one has more, beginning to know what half is. • Children continue and make their own repeated patterns with at least 2 variables, moving towards 3 (ABA, ABBA, ABC), ensuring there are at least 3 repeats. • Children describe their own patterns, explaining their "pattern rule". • Children explore making patterns that work around a circle. • Children begin to spot errors in patterns with support.

Examples of activities

Continuously provide opportunities through storytelling, open-ended activities and role play for children to learn and use the words more/less.

Count the register with class – how many red/green/blue lunch choices? How many children are here today? How many are away?

Count class in from the playground – encourage them to join in. Can they each say their number in the line to show they know what comes next?

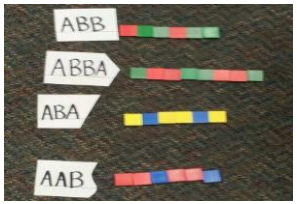
Count around the table – I need 6 children, how many do I have? How many more do I need to make 6?

Do I have enough (scissors/pens etc) for this many children? How many do I have and how many more might I need to make this total?

Children will engage in a variety of sharing activities that can encourage the use of words more and less. For example, children could be asked to share pizza slices or cookies with their friends.

Sorting activities will be modelled and then opportunities for the children to decide how to sort in their own ways be given. Ask them to sort, then see if you can tell how they sorted. Or ask them to label their own sort – if adult did 4 and not 4, perhaps they choose to do 5 and not 5.

Introduce a variety of individual and group games that encourage children to count forward or backwards. Racetrack games backwards is an example of a game that affords the opportunity for children to count backwards. This game is played on a big number line chalked on the ground. This is a game for 2 to 6 players. Each player has some sort of counter. All start at the highest number on the number line. Then one player rolls a dice, and jumps their counter back that number of spaces on the number line. Then the next person goes as each person takes their turn. The winner is the person who gets passed the zero first!



Patterns – children need to explain their pattern, "it goes red, green, blue and then it does it again". Patterns need to be sustained for at least 3 repeats.

Shape and Measures

Key vocabulary

Circle, triangle, square, rectangle
Shape
Curved, straight
Corner/edge/side
Turn
2D
Bigger/smaller

Milestone 2

- Children recognise a wide range of triangles, talking about what makes them the same or different.
- Use 2D shapes to make pictures, understanding that rotating them does not change the shape.
- Children build models using construction and junk, talking about how the properties of the shapes make them suitable for their chosen purpose with vocabulary such as curved, straight, edge, corner, point.
- Understand and use comparative vocabulary for size, length, weight and capacity.
- Children use positional and directional vocabulary themselves to describe positions and movements (for example in, on, under, forwards, backwards).

Taller/shorter Heavier/lighter Full/empty Sort/Match	

Examples of activities

Play "I Spy" a shape with 2 long sides and 1 short side, use descriptions rather than naming the shape. Children to use this language themselves.

Challenge children to copy or create their own construction model with 3D shapes and encourage children to talk about different shapes in their model. Labels can be made for the models – scribed for those that need it, written by themselves by most.

Improve indoor and outdoor provision with measuring instruments and games that children can engage with to weigh or measure a variety of objects/things.
Capacity can be done with water, sand, playdough, cubes – have a quantity of small as well as large containers. How many cubes will fit in this box? How many spoons of sand will fill this cup? Dry sand is better for this and can be inside as well as out.

Take children on nature walks and collect items that were either bigger/smaller, taller or shorter. Gather 3 or more items to order & compare. Children should now be using the language themselves as well as demonstrating their understanding by answering our questions.

Sort shapes, 2D and 3D. Identify the 2D shapes on the 3D objects.

Specific Maths Resources	**Continuous Provision**	**Possible Provision Enhancements**
Tens Frames	Sand and Water Areas with a range of containers and scoops.	Snack Table – add number cards, tens frames, adults to count fruit/milk.

Wide range of Counters – various, natural and man-made. Number cards and number lines – to 10 and 20. Range of shapes – plastic or wooden, carpet tiles, in craft (paper/card, pre-cut or for children to cut). Dice in a range of sizes (inside and out). Dominoes of different sizes (inside and out).	Construction Areas, inside and out with a range of blocks/bricks. Variety of beads for threading/patterns	Loose parts for sorting, matching, counting.

Misconceptions (Quoting NCETM)

Number

- missing out an object or counting an object twice
- when asked how many cars are in a group of four, simply recounting '1, 2, 3, 4,' without concluding that 'there are four cars in the group'
- when asked to 'get five oranges' from a trayful, a child just grabs some, or carries on counting past five
- when objects in a group are rearranged, the child (unnecessarily) recounts them to find how many there are
- difficulties in counting back
- confusion over the 'teen' numbers – they are hard to learn
- missing a number like 15 (13 or 15 are commonly missed out) or confusing 'thirteen' and 'thirty'.
- children not comparing the numerosity of the group and considering more in terms of size (bigger things are more rather than counting quantity)
- children giving a response that does not match the context when estimating a number; e.g. when adding, giving as an answer a number that is smaller than the numbers given. Example: 'There are 7 cars in a garage and then 2 more go in.' The child guesses there are 4 cars in total inside.
- children suggesting that a larger number than the total are hidden.

Patterns

- not recognising a pattern such as ABBA (e.g. stating that patterns cannot have two of the same colour together)
- when copying or extending a pattern, changing it before making three repeats
- spotting that there is an error but not being able to describe it
- identifying an error but not being able to correct it
- correcting an error by making a 'local correction', which just moves the problem along (e.g. by adding an extra item when colours have been swapped)

- describing the whole pattern instead of identifying the part which repeats, or the unit of repeat.
- Shape
- children thinking that only regular triangles are triangles, only brick-like rectangles are rectangles (i.e. shapes are defined by their image, not by their properties)
- children thinking that squares are only squares when the bottom is horizontal (i.e. shapes are defined by their orientation).

Measures

- keeping track of events, e.g. 'Have I had my lunch yet?'
- positional language associated with time; muddling the relative terms 'yesterday' and' tomorrow'
- using 'long' to describe the shape of something (e.g. a block that is much longer than it is wide) rather than to compare lengths
- not taking into account both ends as the starting and stopping point
- not being able to say 'than' in the phrase, 'this is longer than that'
- not understanding that units must cover a complete length, with no gaps or overlaps, demonstrated by thinking that measuring is about counting units placed along something, or putting a ruler alongside and saying a number
- not understanding that units must be equal.