

## Maths Challenge Booklet

Here are ideas of games and activities you can do with your child whilst away from school.





Enjoy

## What to focus on?



In reception we use a document called Development Matters to guide our learning. Below are the sections relating to maths. It highlights focus areas and useful ideas for adults to support. All the activities in the pack will try to link with these outcomes, but feel free to follow your child's interests and adapt and become creative with your child. The activities listed below are ideas for you to pick and choose upon.

Playing and Exploring, Active Learning, and Creating and Thinking Critically support children's learning across all areas

Mathematics: Numbers			
	A Unique Child: observing what a child is learning	Positive Relationships: what adults could do	Enabling Environments: what adults could provide
 30-50 months	<ul style="list-style-type: none"> <li>• Uses some number names and number language spontaneously.</li> <li>• Uses some number names accurately in play.</li> <li>• Recites numbers in order to 10.</li> <li>• Knows that numbers identify how many objects are in a set.</li> <li>• Beginning to represent numbers using fingers, marks on paper or pictures.</li> <li>• Sometimes matches numeral and quantity correctly.</li> <li>• Shows curiosity about numbers by offering comments or asking questions.</li> <li>• Compares two groups of objects, saying when they have the same number.</li> <li>• Shows an interest in number problems.</li> <li>• Separates a group of three or four objects in different ways, beginning to recognise that the total is still the same.</li> <li>• Shows an interest in numerals in the environment.</li> <li>• Shows an interest in representing numbers.</li> <li>• Realises not only objects, but anything can be counted, including steps, claps or jumps.</li> </ul>	<ul style="list-style-type: none"> <li>• Use number language, e.g. 'one', 'two', 'three', 'lots', 'fewer', 'hundreds', 'how many?' and 'count' in a variety of situations.</li> <li>• Support children's developing understanding of abstraction by counting things that are not objects, such as hops, jumps, clicks or claps.</li> <li>• Model counting of objects in a random layout, showing the result is always the same as long as each object is only counted once.</li> <li>• Model and encourage use of mathematical language e.g. asking questions such as 'How many saucepans will fit on the shelf?'</li> <li>• Help children to understand that one thing can be shared by number of pieces, e.g. a pizza.</li> <li>• As you read number stories or rhymes, ask e.g. 'When one more frog jumps in, how many will there be in the pool altogether?'</li> <li>• Use pictures and objects to illustrate counting songs, rhymes and number stories.</li> <li>• Encourage children to use mark-making to support their thinking about numbers and simple problems.</li> <li>• Talk with children about the strategies they are using, e.g. to work out a solution to a simple problem by using fingers or counting aloud.</li> </ul>	<ul style="list-style-type: none"> <li>• Give children a reason to count, e.g. by asking them to select enough wrist bands for three friends to play with the puppets.</li> <li>• Enable children to note the 'missing set', e.g. 'There are none left' when sharing things out.</li> <li>• Provide number labels for children to use, e.g. by putting a number label on each bike and a corresponding number on each parking space.</li> <li>• Include counting money and change in role-play games.</li> <li>• Create opportunities for children to separate objects into unequal groups as well as equal groups.</li> <li>• Provide story props that children can use in their play, e.g. varieties of fruit and several baskets like <i>Handa's Surprise</i> by Eileen Browne.</li> </ul>
 40-60+ months	<ul style="list-style-type: none"> <li>• Recognise some numerals of personal significance.</li> <li>• Recognises numerals 1 to 5.</li> <li>• Counts up to three or four objects by saying one number name for each item.</li> <li>• Counts actions or objects which cannot be moved.</li> <li>• Counts objects to 10, and beginning to count beyond 10.</li> <li>• Counts out up to six objects from a larger group.</li> </ul>	<ul style="list-style-type: none"> <li>• Encourage estimation, e.g. estimate how many sandwiches to make for the picnic.</li> <li>• Encourage use of mathematical language, e.g. number names to ten: 'Have you got enough to give me three?'</li> <li>• Ensure that children are involved in making displays, e.g. making their own pictograms of lunch choices. Develop this as a 3D representation using bricks and discuss the most popular choices.</li> <li>• Add numerals to all areas of learning and development, e.g. to a display of a favourite story, such as 'The Three Billy Goats Gruff'.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide collections of interesting things for children to sort, order, count and label in their play.</li> <li>• Display numerals in purposeful contexts, e.g. a sign showing how many children can play on a number track.</li> <li>• Use tactile numeral cards made from sandpaper, velvet or string.</li> <li>• Create opportunities for children to experiment with a number of objects, the written numeral and the written number word. Develop this through matching activities with a range of numbers, numerals and a selection of objects.</li> </ul>

Playing and Exploring, Active Learning, and Creating and Thinking Critically support children's learning across all areas

Mathematics: Numbers			
	A Unique Child: observing what a child is learning	Positive Relationships: what adults could do	Enabling Environments: what adults could provide
	<ul style="list-style-type: none"> <li>• Selects the correct numeral to represent 1 to 5, then 1 to 10 objects.</li> <li>• Counts an irregular arrangement of up to ten objects.</li> <li>• Estimates how many objects they can see and checks by counting them.</li> <li>• Uses the language of 'more' and 'fewer' to compare two sets of objects.</li> <li>• Finds the total number of items in two groups by counting all of them.</li> <li>• Says the number that is one more than a given number.</li> <li>• Finds one more or one less from a group of up to five objects, then ten objects.</li> <li>• In practical activities and discussion, beginning to use the vocabulary involved in adding and subtracting.</li> <li>• Records, using marks that they can interpret and explain.</li> <li>• Begins to identify own mathematical problems based on own interests and fascinations.</li> </ul> <p><b>Early Learning Goal</b> Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.</p>	<ul style="list-style-type: none"> <li>• Make books about numbers that have meaning for the child such as favourite numbers, birth dates or telephone numbers.</li> <li>• Use rhymes, songs and stories involving counting on and counting back in ones, twos, fives and tens.</li> <li>• Emphasise the empty set and introduce the concept of nothing or zero.</li> <li>• Show interest in how children solve problems and value their different solutions.</li> <li>• Make sure children are secure about the order of numbers before asking what comes after or before each number.</li> <li>• Discuss with children how problems relate to others they have met, and their different solutions.</li> <li>• Talk about the methods children use to answer a problem they have posed, e.g. 'Get one more, and then we will both have two.'</li> <li>• Encourage children to make up their own story problems for other children to solve.</li> <li>• Encourage children to extend problems, e.g. 'Suppose there were three people to share the bricks between instead of two.'</li> <li>• Use mathematical vocabulary and demonstrate methods of recording, using standard notation where appropriate.</li> <li>• Give children learning English as additional language opportunities to work in their home language to ensure accurate understanding of concepts.</li> </ul>	<ul style="list-style-type: none"> <li>• Use a 100 square to show number patterns.</li> <li>• Encourage children to count the things they see and talk about and use numbers beyond ten</li> <li>• Make number games readily available and teach children how to use them.</li> <li>• Display interesting books about number.</li> <li>• Play games such as hide and seek that involve counting.</li> <li>• Encourage children to record what they have done, e.g. by drawing or tallying.</li> <li>• Use number staircases to show a starting point and how you arrive at another point when something is added or taken away.</li> <li>• Provide a wide range of number resources and encourage children to be creative in identifying and devising problems and solutions in all areas of learning.</li> <li>• Make number lines available for reference and encourage children to use them in their own play.</li> <li>• Big number lines may be more appropriate than counters for children with physical impairments.</li> <li>• Help children to understand that five fingers on each hand make a total of ten fingers altogether, or that two rows of three eggs in the box make six eggs altogether.</li> </ul>

Mathematics: Shape, space and measure			
	A Unique Child: observing what a child is learning	Positive Relationships: what adults could do	Enabling Environments: what adults could provide
 <b>30-50 months</b>	<ul style="list-style-type: none"> <li>Shows an interest in shape and space by playing with shapes or making arrangements with objects.</li> <li>Shows awareness of similarities of shapes in the environment.</li> <li>Uses positional language.</li> <li>Shows interest in shape by sustained construction activity or by talking about shapes or arrangements.</li> <li>Shows interest in shapes in the environment.</li> <li>Uses shapes appropriately for tasks.</li> <li>Beginning to talk about the shapes of everyday objects, e.g. 'round' and 'tail'.</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate the language for shape, position and measures in discussions, e.g. 'sphere', 'shape', 'box', 'in', 'on', 'inside', 'under', long, longer, 'longest', 'short', 'shorter', 'shortest', 'heavy', 'light', 'full' and 'empty'.</li> <li>Find out and use equivalent terms for these in home languages.</li> <li>Encourage children to talk about the shapes they see and use and how they are arranged and used in constructions.</li> <li>Value children's constructions, e.g. helping to display them or taking photographs of them.</li> </ul>	<ul style="list-style-type: none"> <li>Measure for a purpose, such as finding out whether a teddy will fit in a bed.</li> <li>Organise the environment to foster shape matching, e.g. pictures of different bricks on containers to show where they are kept.</li> <li>Have large and small blocks and boxes available for construction both indoors and outdoors.</li> <li>Play games involving children positioning themselves <i>inside, behind, on top</i> and so on.</li> <li>Provide rich and varied opportunities for comparing length, weight, capacity and time.</li> <li>Use stories such as <i>Rosie's Walk</i> by Pat Hutchins to talk about distance and stimulate discussion about non-standard units and the need for standard units.</li> <li>Show pictures that have symmetry or pattern and talk to children about them.</li> </ul>
 <b>40-60+ months</b>	<ul style="list-style-type: none"> <li>Beginning to use mathematical names for 'solid' 3D shapes and 'flat' 2D shapes, and mathematical terms to describe shapes.</li> <li>Selects a particular named shape.</li> <li>Can describe their relative position such as 'behind' or 'next to'.</li> <li>Orders two or three items by length or height.</li> <li>Orders two items by weight or capacity.</li> <li>Uses familiar objects and common shapes to create and recreate patterns and build models.</li> <li>Uses everyday language related to time.</li> <li>Beginning to use everyday language related to money.</li> <li>Orders and sequences familiar events.</li> <li>Measures short periods of time in simple ways.</li> </ul> <p><b>Early Learning Goal</b> Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.</p>	<ul style="list-style-type: none"> <li>Ask 'silly' questions, e.g. show a tiny box and ask if there is a bicycle in it.</li> <li>Play peek-a-boo, revealing shapes a little at a time and at different angles, asking children to say what they think the shape is, what else it could be or what it could not be.</li> <li>Be a robot and ask children to give you instructions to get to somewhere. Let them have a turn at being the robot for you to instruct.</li> <li>Introduce children to the use of mathematical names for 'solid' 3D shapes and 'flat' 2D shapes, and the mathematical terms to describe shapes.</li> <li>Encourage children to use everyday words to describe position, e.g. when following pathways or playing with outdoor apparatus.</li> </ul>	<ul style="list-style-type: none"> <li>Make books about shape, time and measure: shapes found in the environment; long and short things; things of a specific length; and ones about patterns, or comparing things that are heavier or lighter.</li> <li>Have areas where children can explore the properties of objects and where they can weigh and measure, such as a cookery station or a building area.</li> <li>Plan opportunities for children to describe and compare shapes, measures and distance.</li> <li>Provide materials and resources for children to observe and describe patterns in the indoor and outdoor environment and in daily routines.</li> <li>Provide a range of natural materials for children to arrange, compare and order.</li> </ul>

Development matters : <https://foundationyears.org.uk/files/2012/03/Development-Matters-FINAL-PRINT-AMENDED.pdf>

## Useful Websites.

<https://www.twinkl.co.uk/> Offering free access during this period of time.

<https://www.topmarks.co.uk/> Top Marks. Lots of educational games including maths.

<https://whiterosemaths.com/> White Rose Maths - will be offering home packs shortly for teachers and parents to access.

<https://nrich.maths.org/13371> Nrich maths - useful activities designed for EYFS.

<https://www.bbc.co.uk/iplayer/group/b08bzfnh> BBC iplayer - Numberblocks.

<https://www.bing.com/videos/search?q=doubles+song&qv=doubles+song&view=detail&mid=D5C8F86A4AC57887ACB3D5C8F86A4AC57887ACB3&&FORM=VRDGAR&ru=%2Fvideos%2Fsearch%3Fq%3Ddoubles%2Bsong%26qv%3Ddoubles%2Bsong%26FORM%3DVDRE> Double song

# Numbers!

Common words and phrases we use are:

- Pointy finger, count and pause,
- Add, plus, altogether, more
- Subtract, minus, take away, less
- Equals
- Count on, count back (using number lines)
- Estimate - a sensible guess

- 1) Can you count how many cars / ponies you have. How many blue, green, red etc? Which colour do you have the most/ least/ same?

Ext - can you mark make those numbers using dots or crosses or with correct number formation?

Ext+ - Can you add the different groups together? How many more/less?

- 2) Can you help with a teddy bear or family dinner? How many plates do we need, spoons, cups etc? Counting them out accurately. What happens if one more teddy joins up, how many then? What if a teddy leaves, how many are left?

Ext - can you mark make those numbers using dots or crosses or with correct number formation?

Ext+ - Can you add the different items together - how many spoons and forks altogether?

Writing a number sentence to follow a problem such as we have 6 teddies for dinner then one more joins us - how many now?  $6+1=7$ .

- 3) Make some number cards 0-20 using paper. Place the numbers around the room 1-10. Ask the child to stack bricks, place cars, pencils etc next to each number card. Start with 3-4 different numbers first so it doesn't become overwhelming. To make it interesting see how many you can do within 2 minutes.

Ext - Numbers from the range 1-20.

Ext + - Using simple calculations on the paper instead. For example  $4+1=$  and see if the child can solve the calculation using resources.

- 4) Mummy/ Daddy has got it wrong, opps!!! With the challenges above it is great for the children at times for see an adult make mistakes. It develops their 'have a go attitude' and helps them explain and teach you what you did wrong. Common mistakes might be not using a pointy finger to count therefore losing your place. Double counting objects so we say line them up, count. Or rote counting which doesn't correlate to the items e.g. counting too fast. We say count and pause to make sure you are accurate in the counting.

- 5) Play Simple Simon Say, can you do 5 jumps, 10 nods, 3 shrugs. Swap the game to a listening /attention game - Can you count how many claps I make?

Ext - Can you show them the number card to support number recognition as well as accurate counting?



Ext+ - Can you do 1 more/ 2 more than 5 nods?

- 6) With the number cards muddle them up and ask the child to put them back in order 1-10.

Ext - numbers 1-20

Ext+ - As the adult you could hide a number without telling them - can they work out the missing number? Ask them to place the numberline starting with the largest number first?

- 7) With the number line, drive a car/ pony etc across the numbers practising saying each number in turn. Go up and down the number line to allow the child to get more confident in their numbers. Occasionally jumping to a number to allow them to start anywhere within the line.

Ext - put your hand over/ remove a number - What number is missing - How do you know? '5 because it is one more than 4 and one less than 6'

Ext+ - Ask them to use the number line to show you for example 2 more than 4? The child would place the car on 4 and make 2 jumps moving up the numberline to land on 6. Further challenge to then write the number sentence. They could tell you number problems they want to solve.

- 8) What do you think? Have a bag of teddies, bowl of small toys etc (below 20 items). How many do you think there is in the bowl? I estimate..... Count to check.

Ext - write or mark make the number.

Ext - How many more was it? How many less was it? Using the number line, lining up to resources to compare. Write the number sentence if you wish.

- 9) Part Part Whole. We have been using a model called part part whole to help us look at a number and understand you can make a number in a variety of ways. For example 5.  $1+4=5$ ,  $2+3=5$ . On paper draw a large part part whole model and place a target number in the top circle. Then ask the child to count out a resources like toys, pens, etc to match that quantity. Work with them to find as many different ways to place the objects in the circles to show how you could make the target number.

Ext - Write the number sentence to match.

- 10) Little puzzles and mishaps! For example: The sock thief - when doing the washing pretend you put in for example 8 socks - by only 7 come out. How many has the sock thief taken?!

Ext - develop the number problem but staying within addition and subtraction up to 20.

- 11) Dice challenge - What do you notices about the sides of a dice - what do they always add up to?

- 12) Play skittles with empty bottles. How many did you knock down. Accurate counting.

Ext - Saying the number sentence 8 take away 4 equals 4. I have got 4 left!

Ext + - Write down the scores for each person playing. Add them together - who won?

- 13) Go for a bug hunt in your garden if possible. Start a bird watch. How many birds/ bugs can you see?

14) Shopping. Set up a shopping area at home. Please can I have 2 bananas and 4 apples. How many do I have altogether?

Ext - Sorry I only have 3 apples, how many more do I need to give you 4?

15) Singing songs such as 10 in the bed, 5 little frogs sat on a log, 5 little monkeys jumping on the bed.

Ext - what if 2 monkeys jumped off - how many would be left etc.

## Shape Space and Measure.

Common words and phrases we use are

### Shapes

- Triangle : 3 sides, 3 points (2d flat shape)
- Square: 4 sides all the same length, 4 points (2d flat shape)
- Rectangle: 4 sides, 2 sides are longer, 2 sides are shorter, 4 points (2d flat shape)
- Circle : 1 continuous curved side (2d flat shape)
- Sphere (often miss pronounced as Sofia!) : 1 curved continuous side, whichever way you look at it is the same. No vertices or edges. (3d shape)
- Cube: 6 faces, 8 vertices (corners), edges that are all the same length. See squares on the faces. (3d shape)
- Cuboid: 6 faces, 8 vertices (corners), edges that are not all the same length. See rectangles on all or some of the faces. (3d shape)
- Cone: 1 flat face which is a circle. 1 vertex (point) 1 continuous side.
- Cylinder - 2 circular flat faces and a curved side. No vertices. You can roll it (3d shape)

### Measure

- Length - longer, shorter, longest, shortest. Line them up - make sure you start measuring from the same place!
- Size - big, bigger, small, smallest.
- Height - tall, tallest, short, shortest.
- Time - morning, afternoon, evening, night, before, after.
- Weight - lighter, heavier, the same.
- Empty, half full/ half empty, nearly full, full.

### Space

- Under, on top, next to, behind, inside, outside, beside, in front, opposite.

### Patterns

- Repeated pattern such as red, blue, red, blue .... What comes next?

## Ideas...

- 1) Go on a shape hunt - I spy with my little eye a circle....  
Ext: I spy with my little eye a 2d shape with 4 sides all the same = 'square on the window'
- 2) Feely bag. Hide different 3d everyday shapes in a bag - I can feel 2 circle faces, one continuous side and no points / vertices - what am I? Examples - glue stick, pen, can (cylinders) book, lego brick (cuboid) ball (sphere), dice (cube), party hat (cone).  
Ext - the child has to describe the shape.
- 3) Building blocks. Find different 3d shapes at home and ask them to build a castle etc. Ask questions around what shapes have you used?  
Ext - what shape is on top of the cylinder (mixing positional language and shape). What shape did you use first/ last (time sequencing and shape)
- 4) Can you make a repeated pattern using colouring pens - red, blue, red, blue etc  
Ext - can you combine with shapes for example cylinder, sphere, cylinder, sphere - can you draw, place shapes in repeated patterns? What would come next? Opps I've done it wrong can you help me... can they understand, tell you how to correct?
- 5) Using phrases and encouraging phrases within your daily routine such as saying good morning, its lunchtime, after lunch, this afternoon, it is the end of the day - night time. Days of the week.
- 6) Measuring their toys - which toy is the longest, shortest? Who can build the tallest tower in a minute? Who can make the longest train?
- 7) Stamp printing vegetables - which veggy super hero is the longest/ shortest?
- 8) Making spaghetti of different lengths - let them play and explore their food - can you line them up shortest to longest? Add some pink food colouring once cooked to make them look like worms!
- 9) Cut out 2d shapes and have a game of musical shapes. When the music stops you have to stand on a circle/ square etc. Helps to reinforce 2d are flat shapes.
- 10) The blindfold challenge - pass the child 2 different objects one light and one heavier. Ask which is lighter/ how do they know. Start with a very light object such as a feather and very heavy like a can of beans to make it very obvious.  
Ext - often children will assume the larger the object the heavier it will be - try this out with a blown up balloon compared to a small heavy object like keys.
- 11) Cooking time - if you are enjoying cooking together support them to weigh out the ingredients and feel the differences - what is more heavy the sugar or baking powder, butter or milk?
- 12) Making potions or mocktails - enjoy creating your own drinks, reinforcing language for measure such as fill the juice to nearly empty, water to half full, put in ice until it is full.



# Number Formation 0 to 10 with Rhymes



Around to my  
left to find my  
hero, back to  
the top, I've  
made a zero.



A downward  
stroke, my  
that's fun. Now  
I've made the  
number one.



Half a heart  
says "I love  
you." Add a line.  
Now I've made  
the number two.



Around the tree,  
around the tree,  
now I've  
made the  
number three.



Down and  
across and down  
once more, now  
I've made the  
number four.



Draw the hat,  
the back and the  
belly. It's a five.  
Watch out, it  
might come alive!



Bend down low  
to pick up sticks.  
Now I've made  
the number six.



Across the sky  
and down from  
heaven. Now  
I've made the  
number seven.



Make an "S" and  
close the gate.  
Now you've  
made the  
number eight.



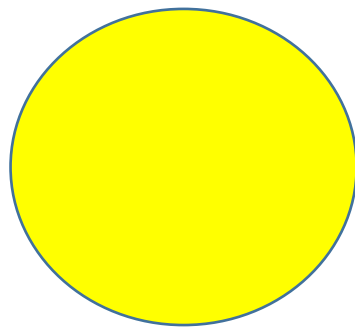
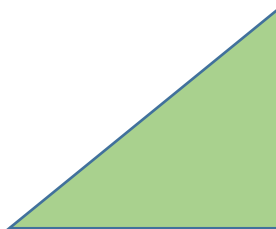
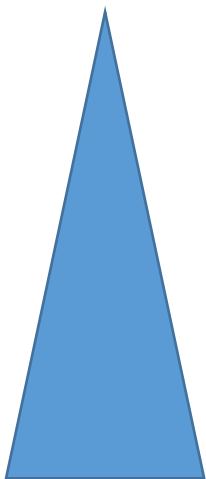
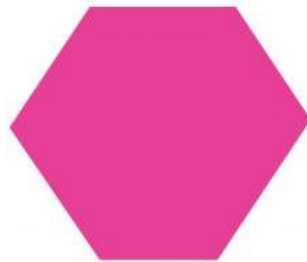
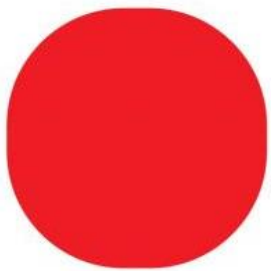
Make an oval  
and a line.  
Now I've  
made the  
number nine.



A downward  
stroke, that's  
my one. Add a  
zero, that's my  
number ten done!

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0	1	2	3	4
5	6	7	8	9
10	11	12	13	14
15	16	17	18	19
20	21	22	23	24



## My 1 to 20 Number Track

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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## My 1 to 20 Number Track

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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## My 1 to 20 Number Track

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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## My 1 to 20 Number Track

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# Part-Part-Whole

