Making Sense of Numeracy and Maths at Home

Inclusion
Respect Ambition
Responsibility Nurture

Mathematics and Numeracy Curriculum

The mathematics experiences and outcomes are set out in the Curriculum for Excellence and are structured within three main organisers, each of which contain a number of subdivisions:

Number, money and measure
- Estimation and rounding
- Number and number processes
- Multiples, factors and primes
- Powers and roots
- Fractions, decimal fractions and percentages
- Money
- Time
- Measurement
- Mathematics – its impact on the world, past, present and future
- Patterns and relationships
- Expressions and equations.

Shape, position and Movement
- Properties of 2D shapes and 3D objects
- Angle, symmetry and transformation.

Information handling
- Data and analysis
- Ideas of chance and uncertainty.

Children at Barassie experience success in mathematics while developing the confidence to take risks, ask questions and explore alternative solutions without fear of being wrong. They will solve problems, explain their thinking and present their solutions to others in a variety of ways with an emphasis on collaborative learning.
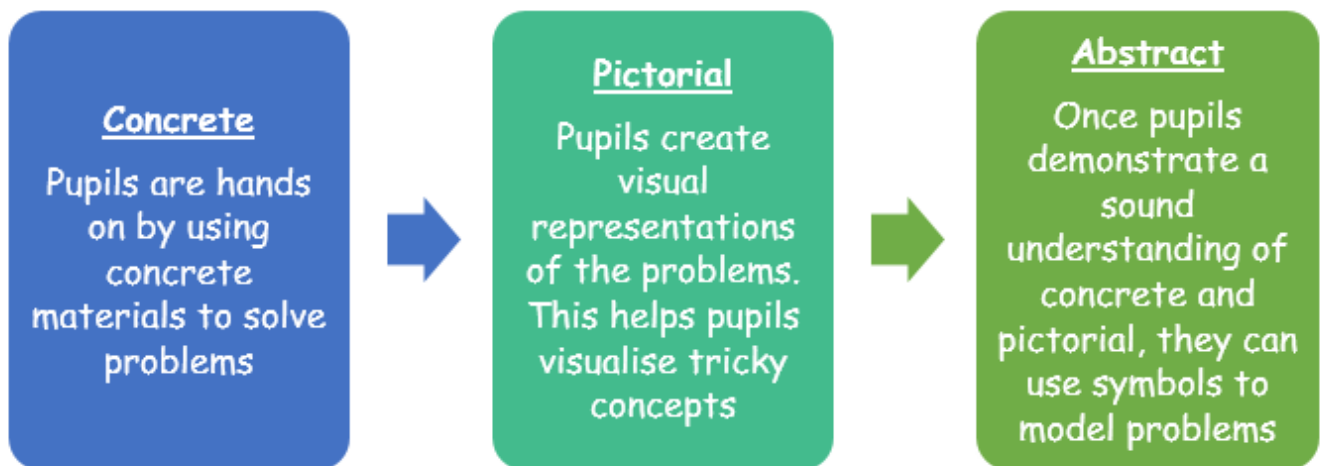
Concrete → Pictorial → Abstract

At Barassie Primary we use CPA as an approach to teaching mathematics.
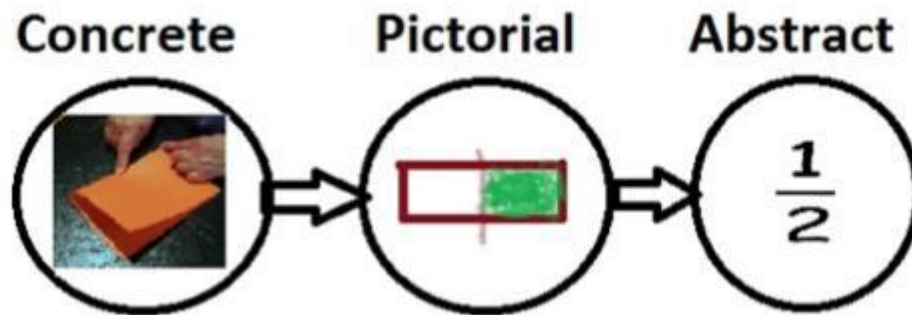
Pupils begin at the concrete level where they use a number of different manipulatives such as dienes, unifix, numicon, ten frames, straws, dot patterns, counters, shapes, coins and dice to help them grasp a concept and solve problems.

Pupils then progress to the pictorial stage which aids visualisation of problems. The Bar Model if a key strategy used within the pictorial stage along with number lines, hundred squares, diagrams and pictures.

When pupils demonstrate a sound understanding of concepts they are able to move to the abstract stage where numbers and symbols are used to solve problems.

Concrete

Pupils are hands on by using concrete materials to solve problems

Pictorial

Pupils create visual representations of the problems. This helps pupils visualise tricky concepts

Abstract

Once pupils demonstrate a sound understanding of concrete and pictorial, they can use symbols to model problems

Strong Foundations

Subitising

the ability to quickly identify the number
of items in a small set without counting

WHY? { Subitizing helps students create a
mental picture & builds number sense. }

Place Value

numerical value of a digit based on its position

WHY? { Place value allows students to
understand that 15 is not a "1"
and a "5"; rather, it is a group
of 10 and 5 ones. }

H	T	O
0	6	5

} 65

Tens Frames

a structured way to work with numbers within 10

WHY? { Develops mental-math abilities and
sets foundation for regrouping }

_____ + 6 = 10

10 = 6 + _____

If children have a
strong understanding
of number, amounts
and the values of
different numbers
they will be much
more confident when
carrying out mental
calculations.
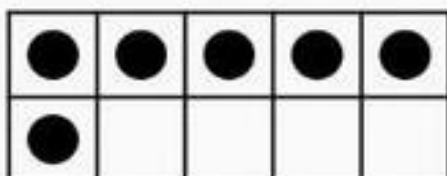
Why Active Learning?

In the early years at school, children learn best by doing rather than sitting at desks with formal work. They learn in several ways, the main ones being visual (by looking), auditory (by hearing) and kinaesthetic (by actively getting involved in activities). Until around the age of eight years of age most children learn by actively getting involved in the classroom, by sharing with their friends and by working together with other children.

Children enter Primary One after many experiences in the EYC of choosing their own activities, experimenting, painting and singing. These learning experiences should continue in Primary One. In Primary One your child's teacher will develop and extend the knowledge that has been gained during their early years experiences.

Through play children can…

- ✓ Enjoy learning
- ✓ Experiment and explore ideas
- ✓ Learn to share and take turns
- ✓ Develop self-awareness and confidence
- ✓ Express fears and anxieties
- ✓ Make choices
- ✓ Take responsibility for their own curriculum
- ✓ Make links across the curriculum
- ✓ Record and share their experiences
- ✓ Develop creativity and widen their knowledge
- ✓ Foster a sense of care and respect for others

This process allows the teacher to observe, listen and talk to the children on a regular basis.

Helpful Hints for Parents to Develop Maths Learning in the Home for Children Starting School

Position

Help with the understanding of the relationship of people, places, things to each other by asking your child to:

- Stand BEHIND the couch
- Stand BESIDE the door
- Sit IN FRONT of the television
- Kneel NEXT to me
- Put the teddy UNDER the table

Size

- Use straws cut to three different lengths and ask your child to find ones which are the SAME length, LONGER or SHORTER THAN.
- Use books to find ones THICKER or THINNER THAN.
- Draw attention to objects of different sizes e.g. match box/cereal box, sweet/biscuit.

Shape

- Draw attention to shapes in the kitchen e.g. round lids, cooker rings or square tiles.
- Look out for things that are round, rectangles e.g. clock faces, wheels, table tops, TV screen etc.

Counting

- Counting Objects: stairs, people, chairs, sweets, toys, buttons on clothes etc.
- Recognition of number: TV channels, house numbers, phone number, ages on birthday cards.

Sorting

- Sorting: clothes into outdoor/indoor, spoons into teaspoons/soup spoons or socks into pairs.

Matching One for One

- Setting the table: a plate for each person, a fork for each person etc.
- Matching numbers to objects: smarties, straws, pennies etc.

Remember, these are just a few examples. You will be able to think of many more.

Number Talks

Number Talks take place on a daily basis.

Pupils are asked to solve a problem or calculation using the mental strategies of their choice.

They use the hand signals above to show when they have a strategy to solve the problem or calculation.

Both correct and incorrect answers are taken and shown on the board. Pupils who are willing to share the strategy they used can demonstrate what they did for others to see.

After a few strategies have been shared, the correct answer is agreed on with the class/group.

From the early stages, Number Talks is delivered using the concrete materials of Rekenreks and ten frames and the pictorial representation of dot images. As pupils progress and begin to learn the Number Talks strategies, whiteboards are used to record workings and approaches are shared on the class interactive whiteboard.
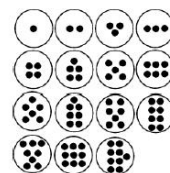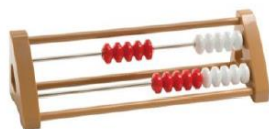
Addition Strategies

Adding Up in Chunks/ Counting On

37 + 48
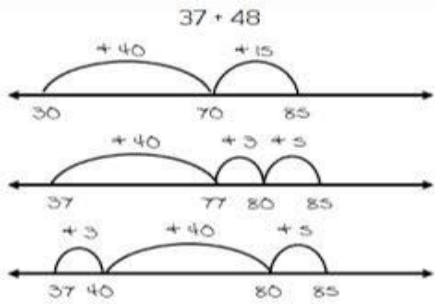
Reordering

25 + 26 + 75

100 + 26 = 126

Place Value - Partitioning

116 + 127

100 + 100= 200

10 + 20 = 30

6 + 7 = 13

200+30+13=243

Making Tens/Bridging Through 10

49 + 38

1   7

50 + 37= 87

Compensation

67 + 28

+2

67 + 30 = 97

97-2 = 95

Doubles/Near Doubles

16 + 17

16   1

16 + 16= 32

32 + 1 = 33

Friendly Numbers

2 8 + 4 7

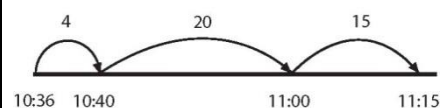+2   -2

30 + 45= 75

Bridging Through 60

10:36

How many minutes is it to the next hour?

Subtraction Strategies

Removal or Counting Back	Reordering
123 - 69 **123 -** (20+40+3+6) **123 –** 20 = 103 **103 –** 40 = 63 **63 –** 3 = 60 **60 –** 6 = 54	25 - 6 - 5 20 - 6 = 14
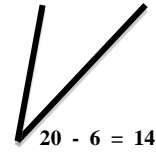
Place Value - Partitioning	Adding Up/Bridging Through 10
367 - 154 367 – 100 = 267 267 - 50 = 217 217 - 4 = 213 367 – 100 – 50 – 4 = 213	**23 - 16** 16 + **4** = 20 20 + **3** = 23 7 +4 +3 16 20 23
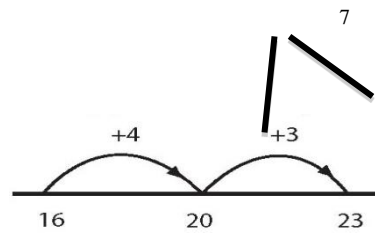
Place Value	Place Value (with negative numbers)
399 - 254 (300+90+9) – (200+50+9) 300 – 200 = 100 90 – 50 = 40 9 – 4 = 5 **100** + **40** + **5** = **145**	**324 - 247** (300+20+4) – (200+40+7) 300 – 200 = 100 20 – 40 = -20 4 - 7 = -3 **100 - 20 - 3 = 77**

Adjusting for Easier Numbers	Keep a Constant Difference
123 - 59 +1 123 – 60 = 63 63 + 1 = 64	**151 – 98** (151 + 2) – (98+2) 153 – 100 = 53 151 – 98 = 53

Multiplication Strategies

Friendly Numbers

9 x 15
10 x 15 = 150
150 – 15 = 135

Don't forget to 'undo' your change!

Repeated Addition

4 x 25
25 + 25 + 25 + 25

50   +   50

100

Partial Products

6 x 125
6 x (100 + 20 + 5)
(6x100) + (6x20) + (6x5)

600 + 120 + 30 = 750

Doubling and Halving

24 x 8
x2   ÷2

48 x 4
x2   ÷2

96 x 2
x2   ÷2
192

Breaking Factors into Smaller Factors

12 x 25

2 x 6
2 x 25 = 50
50 x **6** = 300

Grid Method

35 x 7

✗	30	5
7	210	35

210 + 35 = 245

Division Strategies

Repeated Subtraction

24 ÷ 6

24 – 6 – 6 – 6 – 6
    1x   2x   3x   4x

We are able to subtract 4 lots of 6 therefore**:**

24 ÷ 6 = 4

Proportional Reasoning

Making each number either side of the division sign in the problem smaller by dividing it by the same number.

384 ÷ 16

= (384 ÷ 2) ÷ (16 ÷ 2)
= (192÷2) ÷ (8 ÷ 2)
= (96 ÷2) ÷ (4 ÷ 2)

= 48 ÷ 2 = 24

Partial Quotients

420 ÷ 3

420

?

(300 ÷ 3) + (120 ÷ 3)

300	120

100 + 40 = 140

Multiplying Up

72 ÷ 8

Think: How many times does 8 need to be multiplied to reach the target number?

8 x **5** = 40
8 x **4** = 32

40 + 32 = 72

(**5** + **4** = **9**)

72 ÷ 8 = 9

Big Maths

Big Maths is a teaching programme used to help children to become numerate. Problem solving and word problems cannot be solved until children can manipulate numbers and understand how the number system works.

Big Maths lessons are fast-paced and fun. The children are introduced to child-friendly terms such as 'Switchers' and 'Learn Its', to help them manipulate numbers and make them more confident and more successful. There is a strong emphasis on developing instant recall of number facts, including number bonds and times tables.

CLIC Sessions

This stands for '**Counting'**, **'Learn Its'**, **'It's Nothing New'** and '**Calculation'**. Maths lessons contain each of these elements.

Counting

Children will count forwards and backwards in all kinds of steps depending on their level e.g. in 1s, 2s, 3s, 6s or even 25s! When practising counting at home with your child, make sure you go forwards *and backwards*. Don't always start at 0 – make sure they can count on from 75 to 106 for example.

'Learn Its'

'Learn Its' are addition facts and times tables facts. There are 72 Learns Its in total; 36 addition Learn Its and 36 multiplication Learn Its. **These are facts that children need to learn off by heart**, so when they are asked 'What is 6+4 ?' they are able to give the answer as quickly as they would be able to tell you their name. As soon as they know 3x5=15 they also know 5x3=15 (This is known as a **'Switcher').**

+	2	3	4	5	6	7	8	9
2	4							
3	5	6						
4	6	7	8					
5	7	8	9	10				
6	8	9	10	11	12			
7	9	10	11	12	13	14		
8	10	11	12	13	14	15	16	
9	11	12	13	14	15	16	17	18

Addition Learn Its

x	2	3	4	5	6	7	8	9
2	4							
3	6	9						
4	8	12	16					
5	10	15	20	25				
6	12	18	24	30	36			
7	14	21	28	35	42	49		
8	16	24	32	40	48	56	64	
9	18	27	36	45	54	63	72	81

Multiplication Learn Its

Big Maths Beat That

Big Maths Beat That is a weekly timed test of your child's Learn Its. The aim is to improve their score each time. You can help your child to improve their scores, by asking them to give you instant responses to their Learn Its while at home, on the journey to school and throughout the day at weekend! Little and very often is the key to success, so the information enters the long term memory.

It's Nothing New

This is the most important aspect of CLIC. It is the way children become successful and properly numerate. The idea that 5-things and 3-things are always 8-things is a fundamental concept. Once children understand this concept, we can change the 'thing' to other units, e.g. 'tens', so that 5 tens + 3 tens = 8 tens. Children begin to learn the concept by counting random unit e.g. bananas, aliens, cats etc. It then becomes much easier to use standard measures such as ml, m, cm, kg, whilst understanding the underlying number concepts.

Phrases such as 'Jigsaw Numbers', 'Smile Multiplication' and 'Where's Mully?' are all part of this section of Big Maths.

'Jigsaw Numbers' are a way of adding pairs of numbers to equal 100, or decimals equal to 1.0
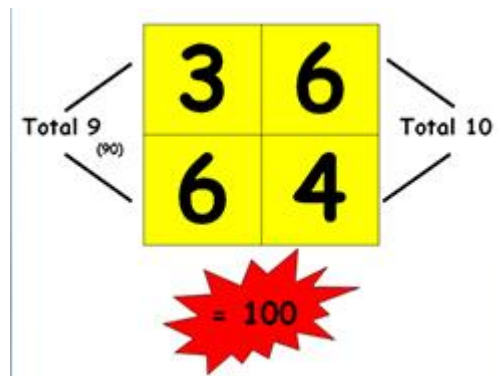
'Smile Multiplication' is used for multiplying multiples of 10 e.g. 40 x 6

'Where's Mully?'

A game that is played to help children master division, which is traditionally the most challenging of the four operations. Mully Multiple hides behind numbers in a number square and the children have to find him. e.g. He's hiding behind the biggest multiple of 3 without going over 40. Where's Mully? – he's on 39! The word 'division' is introduced later!

Calculation

This aspect of CLIC is when the teacher will focus on developing the children's understanding of addition, subtraction, multiplication and division. Big Maths maps out which steps children should do in a clear order and helps teachers to identify where to go back to if a child needs extra support.

Times Table Ideas

Snap or Memory pairs

Make some times table cards with calculations on separate cards and the matching answers on separate cards too for a snap game. Alternatively they can be turned over and used as a memory game finding the matching pairs.

Speed Times tables

Is your child naturally very competitive? Have them race by themselves. How quickly can they fill in the grid? Can they beat their last time?

Alternatively you can draw up a smaller grid and focus on a few tricky numbers.

Speed Tables!

Name:

How quickly can you complete these multiplication squares?

X	3	5	6	4	1	9	8	2	7	10
6										
1										
4										
10										
9										
7										
3										
5										
2										
8										

X	3	4	6	5	2	1	8	9	7	10
7										
2										
4										
10										
8										
3										
5										
9										
1										
6										

Time Taken:

Time Taken:

Recordings

Have your child record themselves reading or reciting the times tables then get them to play it back. They will enjoy using technology and may even want to write it into their own song!

Bingo!

Draw a grid like the one below to make your bingo cards. Decide which table you are focussing on and pop a station (answer) of that table into each box.

e.g. 6 times table

12	24	60
48	36	0

Tennis Tables

This is a partner activity. Take turns to say a fact from a chosen times table and have child should say the answer. If you're feeling brave, feel free to swap roles!

Counting Ideas

- Practise chanting the number names. Encourage your child to join in with you. When they are confident, try starting from different numbers - 4, 5, 6 . . .

- Sing number rhymes together - there are lots of commercial tapes and CD's available.

- Give your child the opportunity to count a range of interesting objects (coins, pasta shapes, buttons etc.). Encourage them to touch and move each object as they count.

- Count things you cannot touch or see (more difficult!!). Try lights on the ceiling, window panes, jumps, claps or oranges in a bag.

- Play games that involve counting (e.g. snakes and ladders, dice games, games that involve collecting objects).

- Look for numerals in the environment. You can spot numerals at home, in the street or when out shopping

- Cut out numerals from newspapers, magazines or birthday cards. Then help your child to put the numbers in orders.

- Make mistakes when chanting, counting or ordering numbers. Can your child spot what you have done wrong?

- Choose a number of the week e.g. 5. Practise counting to 5 and on from 5. Count out groups of 5 objects (5 dolls, 5 bricks, 5 pens). See how many places you can spot the numeral 5.

Real Life Problems

- Go shopping with your child to buy two or three items. Ask them to work out the total amount spent and how much change you will get.

- Buy some items with a percentage extra free. Help your child to calculate how much of the product is free. Plan an outing during the holidays. Ask your child to think about what time you will need to set off and how much money you will need to take.

- Use a TV guide. Ask your child to work out the length of their favourite programmes. Can they calculate how long they spend watching TV each day / each week?

- Use a bus or train timetable. Ask your child to work out how long a journey between two places should take? Go on the journey. Do you arrive earlier or later than expected? How much earlier/later?

- Help your child to scale a recipe up or down to feed the right amount of people.

- Work together to plan a party or meal on a budget. These are just a few ideas to give you a starting point. Try to involve your child in as many problem-solving activities as possible. The more 'real' a problem is, the more motivated they will be when trying to solve it.

Encourage children to:

· act out the problem using cubes, counters, etc.

· draw pictures, diagrams, bar models and number lines

· explain how they are working out the problem

· show you different ways of working it out

Addition and Subtraction Problems

Ask children questions like:

Primary 1

· *There are 8 apples in this bag. How many will I have left if I eat 2 apple?*

· *You has 9 sweets and I have 4 sweets. How many more sweets do you have?*

· *10 birds were on a wire. Some flew away. Then there were 6 left. How many flew away?*

Primary 2—4

· *Sam had 25 stickers then he gave some to Ally. Now Sam has 17 stickers left. How many did he give to Ally?*

· *When Mark is 4 years old, Sadie is 9. When Mark is 8, how old will Sadie be?*

· *Which two numbers could have a total of 32? Which three numbers?*

Primary 5—7

· *How much change will we get from £10 if lunch costs £6.49?*

· *Sam and Tom have £67.80 between them. If Sam has £6.20 more than Tom, how much does Tom have?*

· *It's 35.2 miles from Ayr to Glasgow. How far have we still to go if we've travelled 18.5 miles so far?*

Multiplication & Division Problems

Ask children questions like:

Primary 1

· *Can you share these biscuits between 3 people? How many biscuits each? How many altogether?*

· *Can you put these stickers into fours? How many groups of four stickers can you make? How many altogether?*

· How many pairs of socks are there? How many socks are there altogether?

Primary 2—4

· *How many wheels are there on three cars?*

· *Can 13 biscuits be shared between the four of us? How many will we each get?*

· *24 players turn up for football practice. The coach wants to make teams of 6 a side. How many teams can he make?*

Primary 5—7

· *5 friends win £67 on the lottery. Can the money be shared out evenly? How much would they each get?*

· *Amy puts 4 seeds in each of her pots. She uses 6 pots and has 1 seed left over. How many seeds did she start with?*

· *A comic costs £2.99. How much would 5 comics cost?*

Practising Number Facts

- Find out which number facts your child is learning at school (addition facts to 10, times tables, doubles etc). Try to practise for a few minutes each day using a range of vocabulary.

- Have a 'fact of the day'. Pin this fact up around the house. Practise reading it in a quiet, loud, squeaky voice. Ask your child over the day if they can recall the fact.

- Play 'ping pong' to practise complements with your child. You say a number. They reply with how much more is needed to make 10. You can also play this game with numbers totalling 20, 100 or 1000. Encourage your child to answer quickly, without counting or using fingers.

- Throw 2 dice. Ask your child to find the total of the numbers (+), the difference between them (-) or the product (x). Can they do this without counting?

- Use a set of playing cards (no pictures). Turn over two cards and ask your child to add or multiply the numbers. If they answer correctly, they keep the cards. How many cards can they collect in 2 minutes?

- Play Bingo. Each player chooses five answers (e.g. numbers to 10 to practise simple addition, multiples of 5 to practise the five times tables). Ask a question and if a player has the answer, they can cross it off. The winner is the first player to cross off all their answers.

- Give your child an answer. Ask them to write as many addition sentences as they can with this answer (e.g. 10 = +). Try with multiplication or subtraction.

- Give your child a number fact (e.g. 5+3=8). Ask them what else they can find out from this fact (e.g. 3+5=8, 8-5=3, 8-3=5, 50+30=80, 500+300=800, 5+4=9, 15+3=18). Add to the list over the next few days. Try starting with a x fact as well.

Useful Websites

Website	Useful For
https://www.topmarks.co.uk/maths-games/hit-the-button	Times tables, division facts, addition and subtraction facts
https://www.topmarks.co.uk/ordering-and-sequencing/coconut-ordering	This game is designed to help children gain confidence in comparing and ordering different numbers, including decimal numbers, and metric quantities involving length, mass, capacity and money. You can select an appropriate ability level for your child.
https://www.topmarks.co.uk/learning-to-count/helicopter-rescue	Helicopter Rescue is a mental maths game with different sized number charts, the largest of which is a hundred square and it is designed to help children identify and work with two-digit numbers. It's tablet friendly and the game works well on an interactive whiteboard.
http://www.what2learn.com/baseball-mathematics/	A great game if you have to sit down with your child to make them practice or you just want to improve your own times table knowledge. With this game you can play either against the computer or with two players.
http://www.bbc.co.uk/bitesize/ks1/maths/	P1-4 maths games on BBC Bitesize covering various areas of the maths curriculum.
http://www.bbc.co.uk/bitesize/ks2/maths/	P5-7 games on BBC Bitesize covering various areas of the maths curriculum.
https://ec1.educationcity.com/	Your child has their own login details to access a range of curricular based activities on Education City.
https://www.sumdog.com/	Your child has their own login details to access Sumdog.
www.mathsisfun.com	Various activities.
www.nrich.maths.org	Various activities and problems.
www.mathsplayground.com	Various activities.

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