



The Castle Maths Curriculum

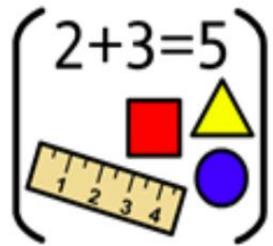
A guide for parents and
carers, staff and visitors



Maths

Maths can be found in every part of day-to-day life, and is a fundamental skill for our pupils to develop in preparation for adulthood. We strive to make maths relevant, engaging and fun, in order to prepare pupils to handle different everyday maths situations with confidence.

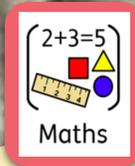




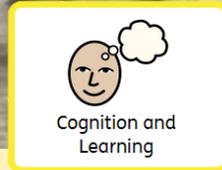
Maths

Pre-formal

↙ reactive and pro-active



Maths



Cognition and Learning

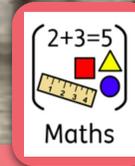
Aims:

- explore the pre-requisites of mathematical awareness
- develop contingency awareness, positional awareness, vision, handling objects, object permanence, and awareness of time, sequence and routine.

Delivery:

- **embedded holistically throughout the day**

Semi-formal



Maths

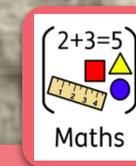
Aims:

- focus on practical skills and confidence in early number skills
- explore shape and number through stories
- experience shape and number in the wider community

Delivery:

- focused sessions on the daily timetable
- planning by subject specialists, delivered by class teachers
- embedded practical skills

Formal



Maths

Aims:

- build fluency, reasoning and problem-solving skills
- build deep understanding of key mathematical concepts for mastering maths

Delivery:

- focused sessions on the daily timetable
- planned and delivered by subject specialists
- maths in the community via life skills and enterprise

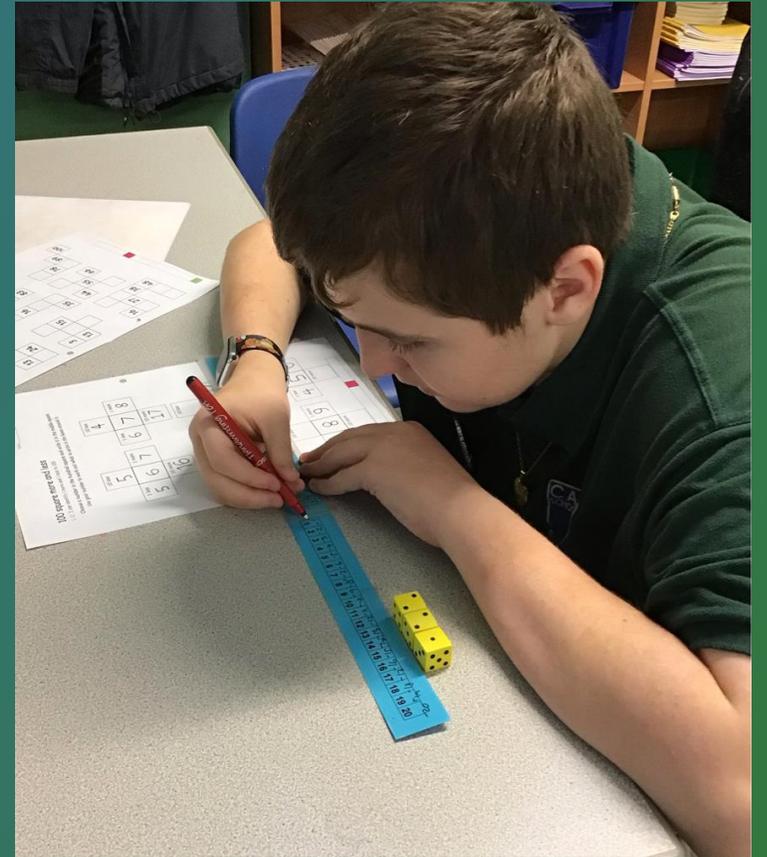
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Pre – formal students work on their understanding of the world. Maths can involve using cause and effect toys, independently exploring objects and textures, using their senses to listen, look, smell and taste and anticipating familiar routines within repeated sequences.

Semi-formal students are taught through a termly topic.

Maths skills are learnt through stories and mastering number. The experience is practical and brings a sense of enjoyment and curiosity about the subject. Pupils learn Maths skills through the experiences of Concrete Pictorial and abstract understanding.

Formal secondary students have discrete timetabled maths lessons. From KS4 these are delivered by a maths specialist teacher who can deliver Maths at Entry Level. Lessons are very practical with a strong focus on problem solving and fluency.



Assessment and accreditation

Assessment is an ongoing process and is an integral part of our teaching and learning. It allows us to identify what pupils already know and can do and helps us to plan the next steps in learning. It also helps us to identify any barriers to learning and then put in the necessary support.

We have designed our own bespoke assessment frameworks, adapted to the needs of our pupils.



Our pre-formal learners use the **Castle Flower** framework, which is adapted from the Victoria MSI curriculum.



Our semi-formal learners use the **Castle Rainbows**, which are adapted from the Birth to 5 Matters EYFS goals.



Our semi-formal and formal learners use the **Castle Gemstones**, which are adapted from the National Curriculum age-related expectations.



Specific taught curriculum based on National Curriculum programmes of study

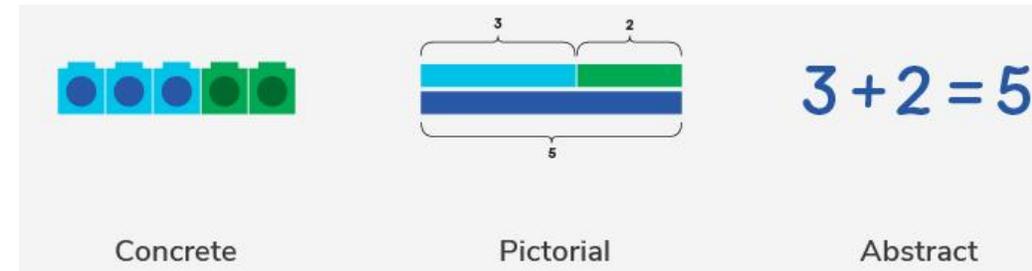
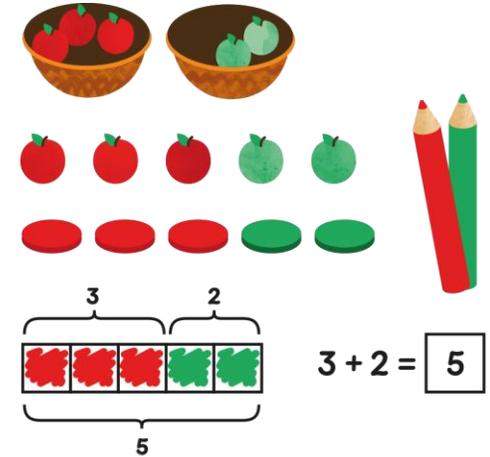
We have adapted the national curriculum to better suit our learners' needs. We aim to ensure that there is a clear progression through the school starting from Early Years Foundation Stage and progressing through Castle Levels (Rainbow and Gemstones) and into accreditation and exams. Our curriculum is aligned with the national expectations and follows the NCETM Progression Maps guidance.



How we sequence learning and plan for progression

- At the early stages of development pupils explore maths skills through stories and themes experiencing learning through play, number songs rhymes and games.
- Learning is developed by using the **maths mastery** approach.
- Lessons are sequenced to develop mathematical fluency and problem solving skills.

We aim for pupils to acquire a deep, long-term, secure and adaptable understanding of the subject.



How we organise the taught curriculum

The sequence of formal teaching has been devised to promote learning, progression and a deep understanding of key concepts that are fundamental to future independence.

We divide the learning into 6 areas that are repeated annually, each area has a scheme of work which supports Teacher planning and ensures consistency across the school

Autumn 1: number, place value, addition and subtraction.

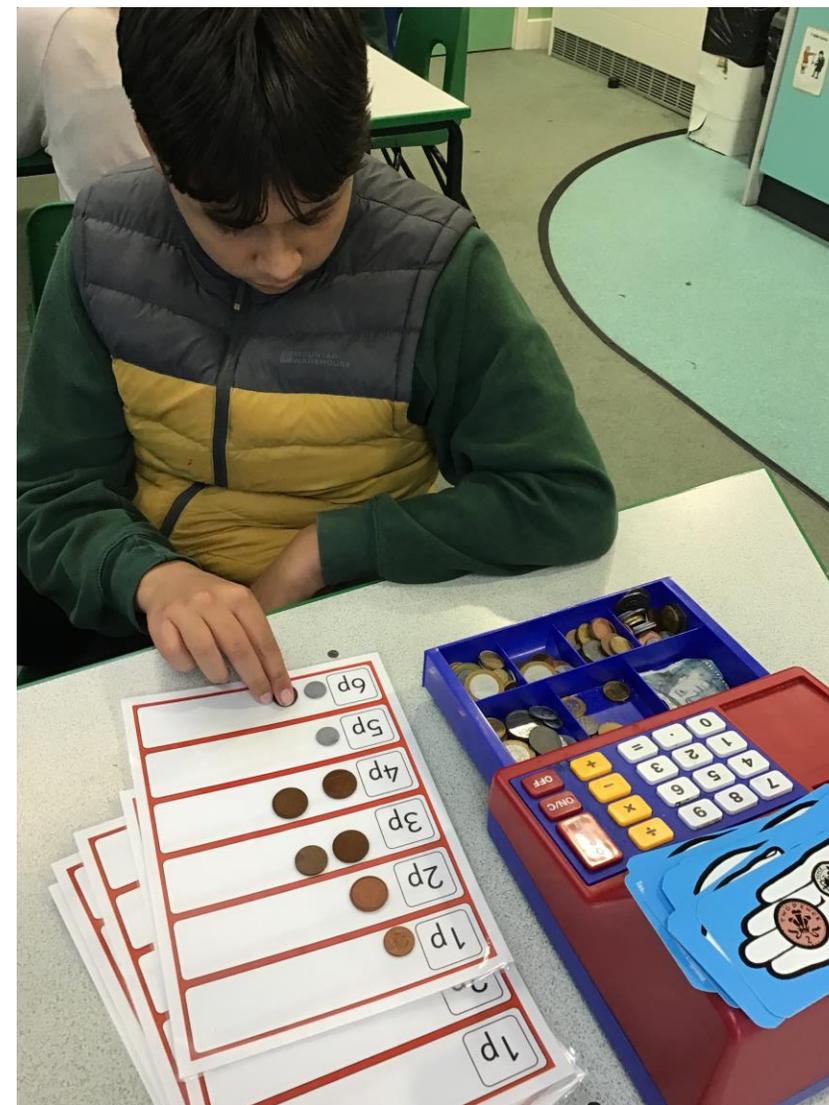
Autumn 2: number, multiplication, division, fractions and decimals.

Spring 1: measurements.

Spring 2: time, money.

Summer 1: spatial awareness geometry

Summer 2: statistics



I can compare and describe lengths and heights.

- **Use concrete and pictorial representations to compare and describe length.** *(This allows students to develop a visual understanding of length and see how different objects compare to each other)*
- **Respond to vocabulary and use language to compare and describe length.**
- **Students to articulate their understanding using the introduced vocabulary.**
- **Solve practical problems about length in real-world contexts.**
- **Compare and order lengths and record the results using $>$, $<$ and $=$**
- **Estimate, compare and calculate – work on predictions about how much something might measure.**

Key Vocabulary:

lengths and heights, long/short, longer/shorter, tall/short, double/half.

Wide, high, deep, width, depth.

RESOURCES and ideas

- Provide students with a variety of objects of different lengths or heights, such as pencils, blocks, toys, or straws. Have students sort the objects into groups based on their length or height e.g. short, medium, tall.
- Use building blocks to compare and construct structures of varying lengths.
- Measure objects during a nature walk using non-standard units like leaves or twigs.
- Engage in a paper chain construction challenge, comparing lengths.
- Draw lines of different lengths on pavement with chalk.
- Playdough Snake Challenge: Roll playdough into snakes of varying lengths for comparison.
- Lego Tower Challenge: Build towers with Lego blocks, each having a different height.
- Have students build towers using blocks, straws, or other objects. Encourage them to compare the heights of their towers and to use language like "taller," "shorter," and "the same height."
- Provide students with non-standard units of measurement, such as paper clips, cubes, or buttons. Have them measure the length of various objects using these units and then compare their results.
- String Telephone Experiment: Connect two cups with a string to explore length affecting communication.
- Estimation Game: Choose an object and have students estimate its length or height. Then, measure the object and compare the students' estimates to the actual measurement.
- Length Measurement Scavenger Hunt: Hide objects of different lengths around the classroom or outdoors. Have students find the objects and measure their lengths using non-standard or standard units.
- Floor Length Measurement: Have students measure the length of the classroom floor using non-standard or standard units.
- Outdoor Obstacle Course: Create an outdoor obstacle course with objects of different heights. Have students navigate the course and compare the heights of the obstacles.
- Classroom Height Chart: Have students stand against the chart and mark their heights. Then, compare the heights of different students.
- Play a game of charades where students act out words related to length, such as "short," "tall," "the same height," and "longer than." Other students must guess the word.

Number

Place value, addition and subtraction

Pupils begin to explore number through play and learn the relationship between numbers, objects and then the number system.



Number

Decimals and fractions

Pupils learn and use decimal and fractions in different context such as games, shapes, numbers and real life context.



Measures

Pupils learn to compare and measure objects using different measuring tools in practical situations.

They use non-standard and standard units to measure.



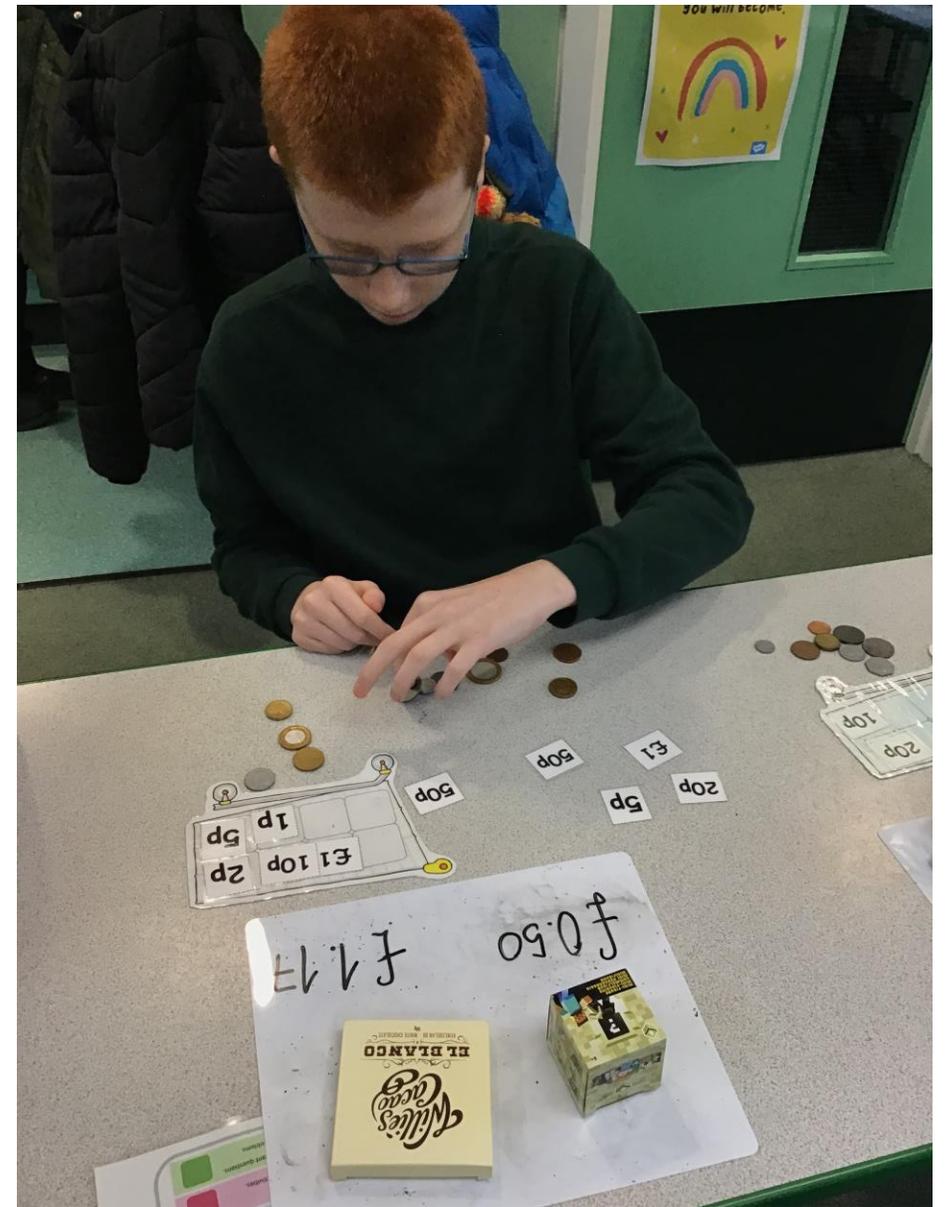
Time and money

Order and sequence events and tell the time using digital and analogue.

We introduce money concepts early to build a strong foundation through roleplay and using money in the community.

We explain why money is essential, its role in daily life, and the concept of earning and spending.

This is enhanced in KS 4 and 6th form by the Money Heroes programme for our formal learners.



Spatial awareness

Pupils learn how objects relate to one another. They learn how to manipulate objects and place them in different places in relation to each other. They also learn positional language and use this to describe and solve problems.



Geometry

Properties of shapes

Position and direction

Pupils learn how to use everyday language to describe properties of 2D and 3D shapes and their mathematical names. They also learn how these relate to each other and can use this knowledge to inform practical activities.



Statistics

Pupils engage in practical activities to collect data.

They develop effective ways to communicate their findings by using tables, graphs, pictograms, etc.



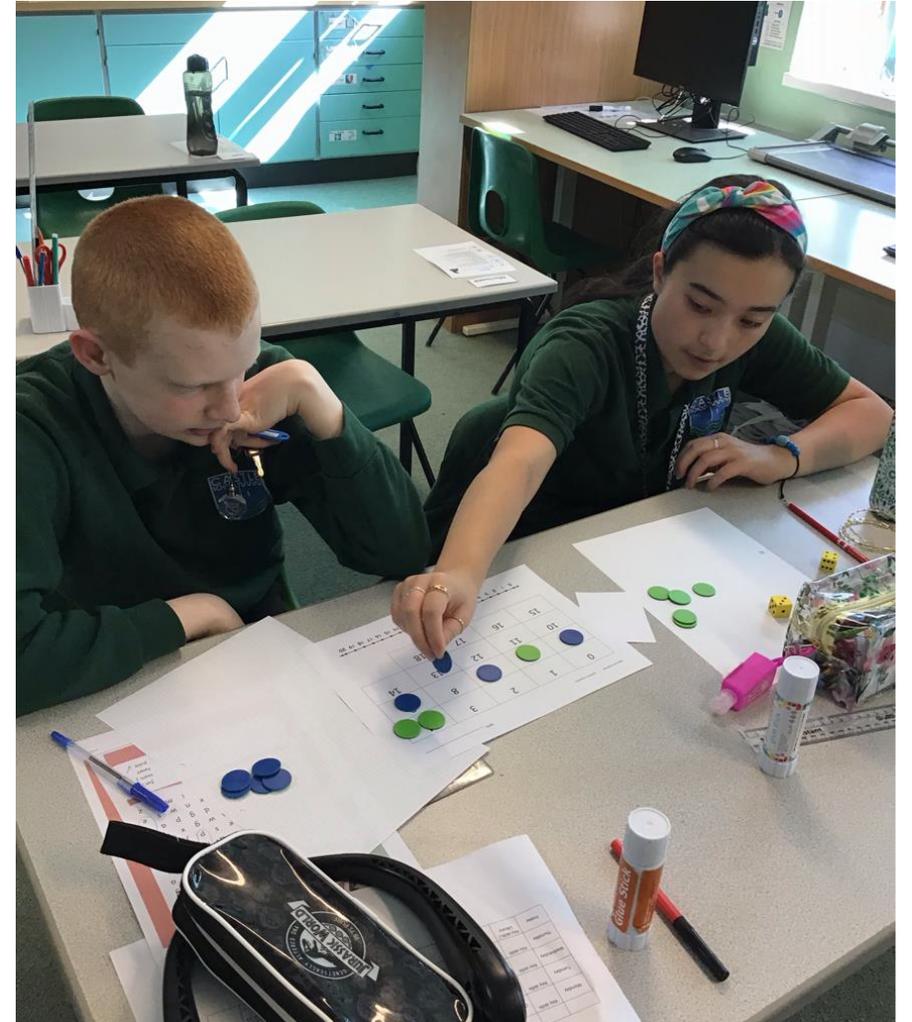
Surveys and research

It is important that learners experience maths in the context of the real world. Part of this is getting 'out and about'. Research and surveys are a great way to explore the importance of maths while building independence and social skills.



Problem solving

Pupils are encouraged to communicate with others to solve practical problems.

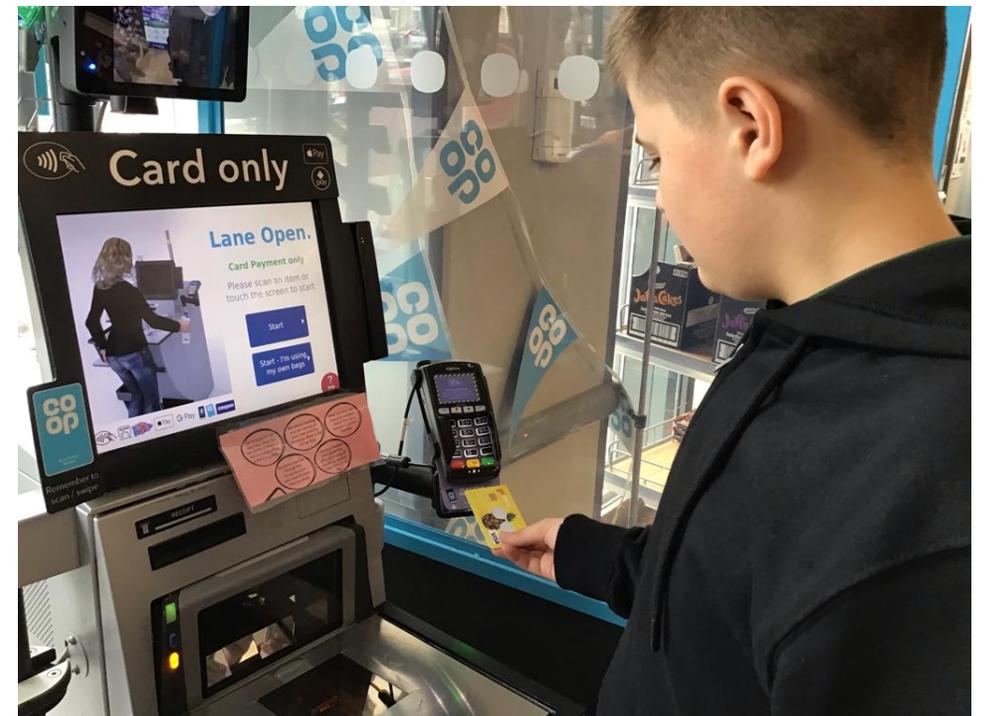


Financial education

Pupils are guided on key areas of financial knowledge, skills and attitudes, across four core themes:

- how to manage money;
- becoming a critical consumer;
- managing risks and emotions associated with money;
- understanding the important role money plays in our lives

In our KS4 and KS5 curriculum we have incorporated the Financial Education Framework.

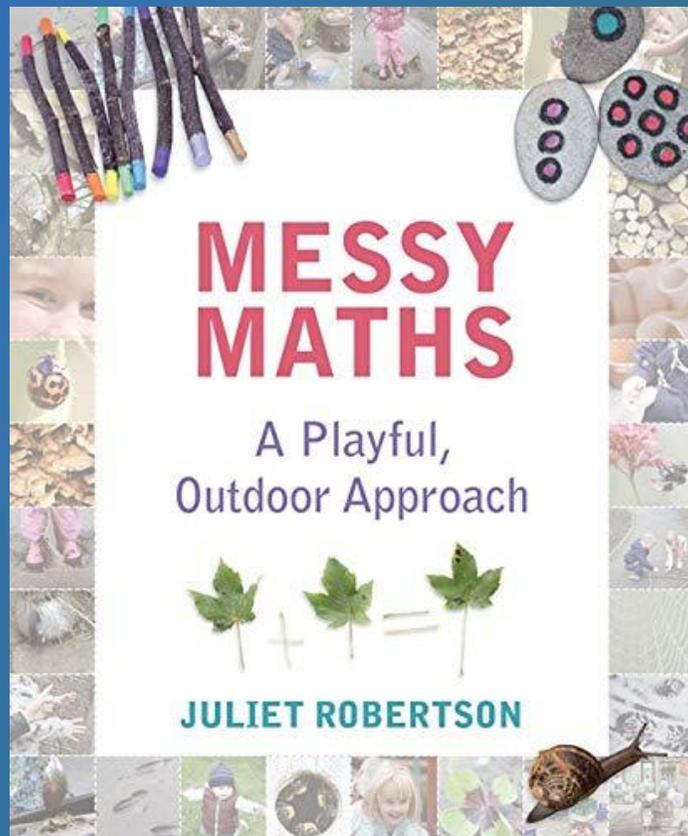


Thematic and cross curricular learning

- We bring maths alive, using approaches such as through play, Messy Maths, Maths in Stories, going outside, and sensory activities.
- Pupils are exposed to the use of mathematical language and problem skills throughout the day. Teachers link pupils' daily routines and activities to key maths skills encouraging pupils to develop their mental arithmetic and to use the correct mathematical vocabulary. This has resulted in pupils gaining the confidence to express themselves, make connections and talk about their work.
- Across school and pathways, a range of resources is used to support the teaching and learning of Mathematics, including interactive programs, practical activities, games, and different ways of recording and presenting maths work.
- Our formal learners embed and generalise their maths skills by working on cross-curricular projects, such as enterprise and catering and developing the Maths Mastery skills.
Updated Autumn 2023



Messy maths



Maths in stories

Semi-formal mathematics is primarily taught through stories, an approach that has proved highly successful by putting learning into context, resulting in highly motivated learners.

This approach involves looking at the stories we use through a mathematical lens and then linking this to the developmental stage of each pupil.

It is fascinating to see how much maths can be found in any text.

Here is an example of our planning for each text:

Literacy

Delivered through play-based learning, interwoven through different activities throughout the day, including circle time, snack, lunch, individual programmes, and various interventions. Literacy themed continuous provision tuff spot available each day.

Reading & comprehension

Exploring a range of texts through our daily reading sessions. Also, sharing stories with each other through small group sessions. Enjoying stories in different forms – a sensory story based on our focus text 'Handa's Surprise', video version of different stories, stories through songs, and story creating games. Activities based on our focus text that are incorporated into our morning English activities. These activities will be designed to improve comprehension of the story and the message behind it.

Writing & communication

Focus: Hand to hand coordination
Opportunities for mark making to improve letter formation and tool manipulation – morning tuff trays, art, and messy play.
Social games to aid coordination – tum taking games (connect 4), stage 3 bucket and teamwork games (building towers and role play).
Morning activities to improve letter formation through tracing and copying.

Phonics:

Focus: Phase 1 and 2
Daily sessions concentrating on matching letters to their sounds and being able to use words with the sounds in context.
Throughout the rest of the day exposure to phase 1 sounds through themed tuff trays and sound modelling. Incorporation of sounds throughout all activities.

Community Engagement**Text: Handa's Surprise****PSHE****Healthy eating**

Opportunities to explore healthy and new foods through sessions like touch and taste, snack and lunch. Provides opportunities to experience different textures and tastes.

Emotions

Openly talking about our emotions during whole class sessions like circle time. Modelling the names of emotions and matching them their facial expressions. Being supported through challenging emotions using different interventions.

Sense of self

Sessions to help understand ourselves and our bodies – Touch and Groove, and sensory circuits. Opportunities to express likes and dislikes.

Building relationships

Sharing songs in music and choir – sharing instruments. Participating in whole class sessions throughout the week and sharing spaces with each other.

Communication

Delivered through all activities and interaction throughout each day.

Attention building activities:

- Items to go in the bucket:**
Rinsing sensory ball, ribbon on string, wind up chattering teeth, noisy pig, hand clappers.
- Attention builders:**
Orange tree. Splatting orange paint on a tree. Fruit pattern. Dipping fruit halves in paint and making patterns with them.
- Attention Shifter:**
Throwing fruit in the basket, raining leaves, jumping bean, and see saw.

Interventions

Touch and Groove, role play (picnic food and puppets) and intensive interaction.

Makaton

Signs to go with the daily schedule and key vocab from the story (fruit). Singing and signing songs.

Communication boards/PECS

Encourage choices and requests (during circle time, snack & lunch time and within activities) Focus on core vocab (more, help, hello, goodbye, like, don't like). Song choices.

Circle time

Say hello/goodbye, 1:1 engagement with adult, noticing others in the class, and making choices.

Creativity

Incorporated into different sessions throughout the week. Focus on mark making and block printing with paint through our focus story and self-expression.

Art

Experimenting with primary and secondary colours and mixing them. Using different mediums to paint fruits from our story, fruit printing, creating a tree by collaging etc.

Music

Exploring different sounds, keeping a beat, singing together and intensive interaction through a musical approach.

Choir

Listening and singing different songs from choir. Dancing along alone or together, copying actions and making choices in what song to sing next.

STEM/Our World

Physical development focusing on health, self-care, and living things being delivered through play, personal experiences, experience of a diverse world, and widening vocabulary.

Forest School

A child led approach where pupils can explore their environment and have the independence to take risks as they explore. Scavenger hunt to explore the living things we have in forest school.

Sensory trays

Morning trays provide opportunities to explore liquids, solids, cold and warm. Child led with adults modelling how to interact with the tray. Can use fruit from our story and leaves from outside.

Physical**Gross Motor:**

Swimming – increasing water confidence, developing swimming skills (kicking, splashing and floating), putting faces in the water and holding onto the side.

PE (basketball) – developing hand eye coordination through throwing, catching, bouncing, and pushing.

Fine Motor:

Clever fingers – fishing using tongs, transferring water using pipettes, pegs on a board, cutting up fruit, and putting pegs on a washing line.

Mathematics

Math through stories delivered through play-based learning, interwoven through different activities throughout the day, including circle time, snack, lunch, individual programmes and various interventions. Numeracy themed continuous provision tuff spot available each day.

Number cardinality and counting

Count number of children in the class.
Count plates for snack and lunch.
Counting songs: 5 little speckled frogs, 5 little ducks and the ant goes marching.
Taking all opportunities to count with the pupils and showing 1:1 correspondence. For example, counting steps, jumping on the trampoline, counting fruits during touch and taste, and counting fruit in a bowl.

Incorporating counting in attention building. Showing how numbers can be represented differently. Counting how many times the toy is wound up, how many paint splats there are, and how many jumps on the trampoline. Providing number representations in addition to verbally counting. Focusing on numbers to 5 and then slowly increasing to 10.

Reading/writing numbers

Providing opportunities for pupils to experience numbers and to write them.

Morning activities focus on pupils practicing writing numbers.

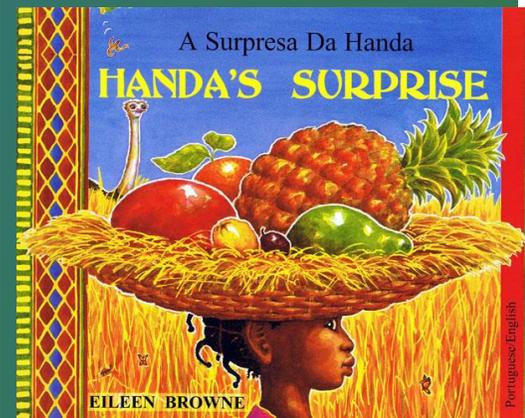
Adults modelling writing numbers during messy play, and role play games. Providing number to correspondence for objects to expose pupils the written version of the numbers.

Number bonds

Introduction to the concept of addition and subtraction through nursery rhymes, stories, and play.

Comparison

Comparing quantities and identifying which has 'more' and 'less'. Discussions about which basket has 'more' fruit in.



Everyday maths

Maths inside and out
Maths across the curriculum
Maths at home
Through play

how many

How many cars have you got altogether?

Playing with toy vehicles and play people

EARLY
CHILDHOOD
MATHS GROUP

direction

My car is going over / under / around the bridge.

size

Which do you think is the biggest / smallest car? Why do you think that?



size & shape

Can we make a car park / garage to fit these cars?

website



Watch your child playing • See what they enjoy doing • Join in and use these ideas when they seem ready

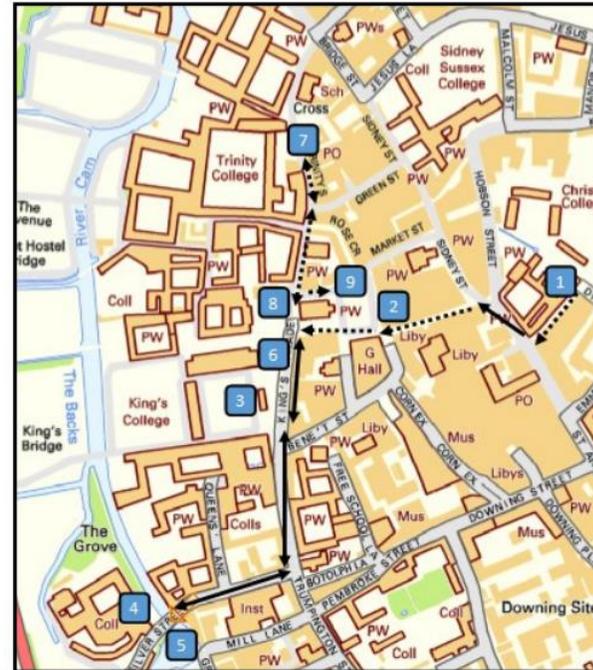
Maths in the community

Cambridge Maths Trail: Blue Trail

Name(s): _____

Date: _____

- 1. Drummer Street Bus Station** - Look at the electronic timetable. Calculate the difference in time between the first bus and last bus arriving.
- 2. Guildhall/Snowy Farr statue** - Can you write and solve a mathematical question about the Snowy Farr statue?
- 3. King's College Gateway** - Look at the clock face and estimate the size of the angles created by the hour hand and minute hand.
- 4. The Mathematical Bridge** - Look at the bridge and the surrounding buildings. What shapes can you see? Make a list of 2D and 3D shapes.
- 5. Silver Street** - Count the number of large and small punt boats. If one large punt boat can hold 12 passengers and one small punt can hold 6 passengers, how many passengers could take a punt in total?
- 6. King's College Chapel** - What would be a quick and effective way of estimating the number of small rectangular glass panes used to create the large stained glass window?
- 7. Trinity College Great Gate** - Can you find an object or shape that has both reflective symmetry and rotational symmetry? Sketch the shape(s) that you find.
- 8. St Mary the Great church** - Find the scale model. Use the scale to estimate the height of the church tower, in metres.
- 9. Market Square** - Standing on the corner, next to the phone boxes, look at the market stalls and calculate what fraction of the stalls (that you can see) sell food.



Extra challenge: On your trail you will pass several clock faces. Each time you see a clock, record the time and calculate how much time has passed since you recorded the last time.

Core vocabulary

We have a Core Vocabulary sheet for each half term.

It is accessed by logging into Widgit online: > Shared Folder > Maths Vocabulary

Maths Autumn 2 : Vocabulary							
123 number	group	\times multiply	share	\div divide	$\frac{7}{10}$ fraction	part	whole
0.4 decimal	$+$ add	$=$ equal	\times times	$3 \times 2 =$ product	factors	array	$4 \div 2 =$ division
$6 \div 2 = 3$ quotient	remainder	$4 \div 2 =$ dividend (1st no)	divisor	$13 \rightarrow 10$ $16 \rightarrow 20$ nearest ten	$8.3 \rightarrow 8.3$ $9.3 \rightarrow 9.4$ round to	closest to	estimate
approximate	equal to	$\frac{7}{10}$ numerator	$\frac{7}{10}$ denominator	$\frac{1}{2} = \frac{2}{4} = \frac{4}{8}$ equivalent fraction	$\frac{10}{10}$ tenths	100 hundredths	0.4 decimal point
half	$\frac{1}{2}$ half	quarter	$\frac{1}{4}$ quarter	third	$\frac{1}{3}$ third	compare	same
different	solve	problem	$>$ more than	$<$ less than	$=$ equivalent to	$+$ \times $-$ \div reverse operation	calculate

Number: Multiplication : Division : Fraction : Decimal

next



Maths week

Maths week is celebrated every Autumn term.

The focus is on enhancing particular maths skills.

We invite community engagement experiences so that maths skills are used in context and in real life.



Extended opportunities and partners

We develop our Maths teaching and learning by using the National Centre of Excellence for the Teaching of Mathematics progression materials and professional development.

We have strong links with Cambridge Maths hub.

Currently we are collaborating with the NCETM's Maths SEND forum with the aim to devise a SEND Maths Curriculum.



Useful links and resources

[Early Childhood Maths Group](#)

[Numberblocks](#)

[NRICH](#)

[Early Years Number Activities](#)

[Open Up to Outdoor Mathematics](#)

[Maths Frame](#)

[Topmarks](#)

[BBC bitesize](#)

[Oxford Owl](#)

[IXL ICT Games](#)

[Splash Learn](#)

[Crickweb](#)

[Mathletics](#)



[Mathseeds](#)

