National Curriculum Links
(Scope)

NCETM National Curriculum Resource Tool

Intent, Implementation & Intent

Calculation Policy

Scheme of Learning

Big Maths

Wider School Links

Maths

Vocabulary

Significant Individuals

RtP Year 1

RtP Year 2

Across the Years

Small Steps Yr1

Small Steps Yr2

Year 1 Progression
(Sequence)

Year 2 Progression
(Sequence)

All Subjects

Maths

At Trenance we believe that everyone can succeed in Mathematics. We know how important good maths teaching is because everything a child learns while they are with us paves the way for future learning. We use White Rose Maths and Big Maths to support our comprehensive teaching. Each unit is broken down into small steps allowing all children to gradually build and develop their understanding on previous knowledge.

We use a Concrete Pictorial Abstract (CPA) approach and allow pupils to spend enough time to fully explore a concept, reinforcing it with practice, before moving onto the next one. Mental arithmetic is practiced every day within lessons as well as further opportunities to use mathematics in the afternoons during topic work.

Lessons comprise of teachers directly teaching the class followed by children practicing their maths skills by teaching each other. We work closely with the Maths Hub to support teaching our children Mastery. Mastering maths means acquiring a deep, long-term, secure and adaptable understanding of the subject. At any one point in a pupil's journey through school, achieving mastery is taken to mean acquiring a solid enough understanding of the maths that has been taught to enable him/her to move on to more advanced material.

- Key points:
- A highly effective approach to teaching maths based on research and evidence
- Builds students' mathematical fluency without the need for rote learning
- Introduces new concepts using Bruner's Concrete Pictorial Abstract (CPA) approach
- Pupils learn to think mathematically as opposed to reciting formulas they don't understand
- Teaches mental strategies to solve problems such as drawing a bar model

Find out more at the Big Maths and White Rose websites. Have a look at the schemes of learning for each year group;

- EYFS
- Year One
- Year Two
- Calculation Policy

Maths Overview

Maths: Intent, Implementation, Impact

Intent	Implementation	Impact
(curriculum design, coverage & appropriateness)	(curriculum delivery, teaching & assessment)	(attainment & progress)
The aim of the Maths curriculum is to ensure all children: · Become fluent in the fundamentals of maths through intelligent practice · Develop their conceptual understanding and the ability to recall and apply knowledge rapidly · To reason and problem solve by applying their mathematics to a variety of increasingly complex problems. · To build upon children's knowledge and understanding from YF – Year 2. · To develop independent learning behaviors through choice and challenge. · To develop confident, articulate children. · To develop resilience and stamina to enable all children to reason and problem solve with an increased confidence.	· Termly topics are planned to ensure a broad and balanced curriculum is taught across all areas of maths · Daily maths lessons include fluency, problem solving and reasoning to provide opportunities for intelligent practice and appropriate challenge for all groups of learners. · Big Maths lessons taught daily to develop fluency, rapid recall and retention across all classes. · Concrete manipulatives and pictorial representations are used to support conceptual understanding and make explicit links · Children complete end of unit checks to gauge understanding. · Gaps identified within Big Maths sessions are used to inform planning and sessions are provided to support the filling of gaps.	· End of key stage attainment is above national percentages. · Children's progress is tracked half termly using Target Tracker · Internal moderation of books provides evidence of consistent teaching and opportunities where all pupils use their knowledge of manipulatives and pictures to write abstract ideas. · Well planned sequences of learning, support children to develop and refine their maths skills. · Children are independently able to apply their understanding to solve a range of complex problems across all subjects. · Children are reasoning with increased confidence and accuracy. They are able to voice their opinions and justify decisions they have made.
EYFS · To develop a deep conceptual understanding of the numbers to 10, providing all children with a secure base knowledge from which mathematical mastery is built.	EYFS Children are taught lessons focusing on developing a love of maths. Fluency, problem solving and reasoning are incorporated into each lesson and children are provided with the opportunities to use a range of manipulatives, discuss their learning and be subject to high quality modelling.	EYFS Children are excited by maths and enjoy lessons. Children's attainment has risen to < 85% by the end of EYFS. Children have a deep understanding of mathematical concepts that they are using in their wider school community.

Maths Overview

Foundation	Year 1	Year 2
Autumn	Autumn	Autumn
Spring	Spring	Spring
Summer	Summer	Summer

Vocabulary

Division, sharing, grouping, fractions, reason, equate, fact families, commutative law, appearance, repeated addition, numerator, denominator, half, quarter, third

Greater, more larger, less, smaller, partition. Part part whole, forwards, backwards, tens, ones, bar model, number sentence, maths stories, minus, subtract, addition, same value, multiply, arrays, columns, rows, division, groups,

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Foundation

More, less, fewer, count on, count back, count up, same as, most, least, biggest, tallest, smallest, even, odd, altogether, add, take away, equals, sharing, fair, jumps, times tables

More, less, fewer, count on, count back, count up, same as, most, least, biggest, tallest, smallest, even, odd, altogether, add, take away, equals, sharing, fair, jumps, times tables

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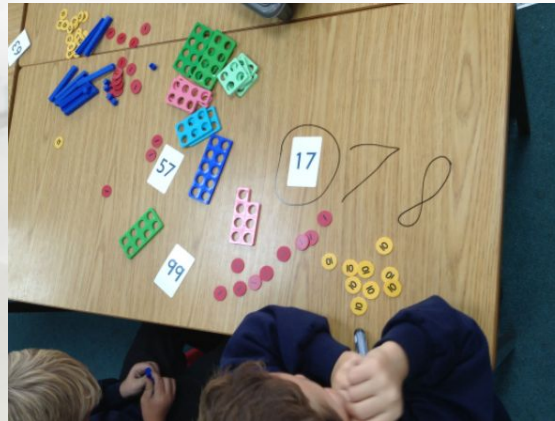
Maths Overview
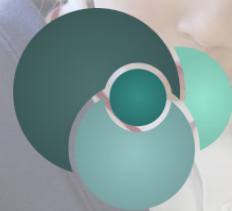
Maths (YF)

In Reception we learn ....
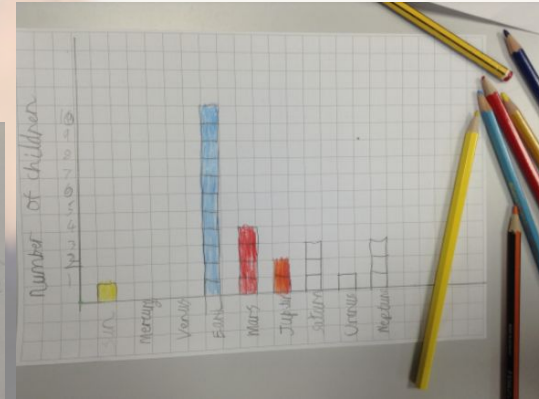
Maths (Year 1)

In Year 1 we learn ......
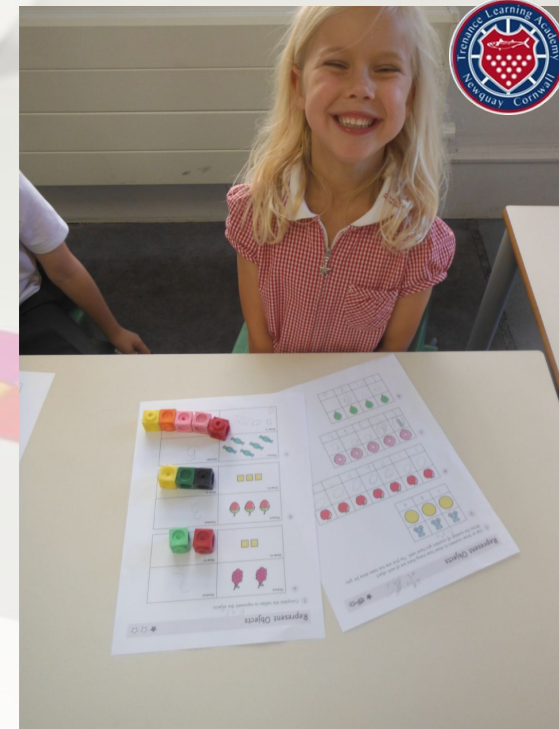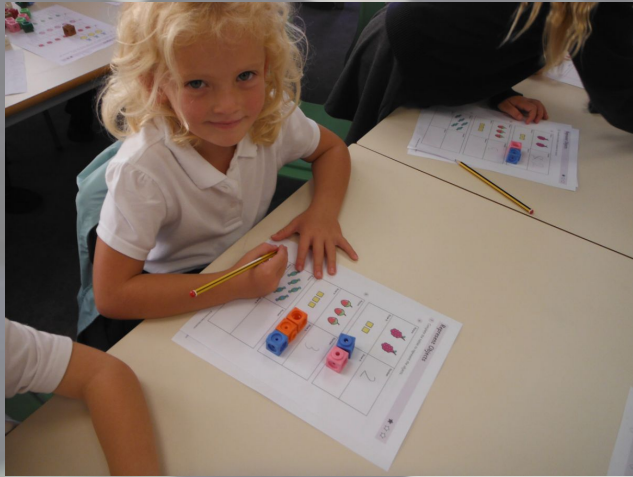
Maths (Year 2)
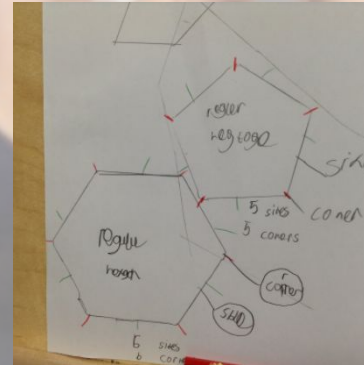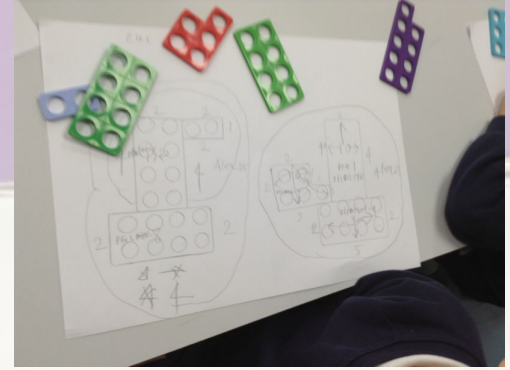
Maths Overview

Rainbow Continuum

	Number	Shape & Measure	Data and Statistics
EYFS	Pre skills and playing with numbers Enjoy pattern, or simple counting rhymes	Choose shape and measure games – e.g. water play in continuous provision, shopping in role play	Play simple pattern games Collect objects and sometimes group them
Year 1	Remember and recall simple number facts Count to 100 with number bonds to 20 Repeat number rhymes Label objects with numbers and order them Select objects to a given number Put objects in a table Arrange numbers in order	**SHAPE:** Arrange different objects into order of size Recognise, draw and begin to make simple 2D and 3D shapes (e.g. with construction kits), Draw lines and shapes using a straight edge **MEASURE:** Record results or order them Recognise and use lengths, heights, mass, weight, capacity, volume in broad measures – e.g. long, heavy **TIME:** Use time in broad measures – ten o'clock **MONEY:** Understand the concept of "paying" and recognition of money denominations	Make a simple block graph with help Make hierarchical lists Put data into a table Record objects using tallies Arrange objects in order using different criteria Recognise simple patterns
Year 2	Use number for simple one step problems for addition and subtraction Estimate quantities Multiply using concrete objects Classify objects and count numbers in groups Identify more than or less than Compare numbers of objects in different groups Estimate small numbers of objects in different groups	**SHAPE:** Describe position, direction and movement in broad terms – behind, left, south. Identify properties of 2D and 3D shapes to compare and sort them **MEASURE:** Make simple recording of measures and comparative measures – e.g. heavier, longer. Choose and use standard units to estimate and measure in length, mass, temperature, capacity **TIME:** Sequence events in chronological order Use time to the hour and half past **MONEY:** Recognise and use symbols for money and combine amounts	Use a simple block graph with help Classify objects according to different criteria Explain reasons for classification Use Venn and Carroll diagrams to group in different ways Compare objects within groups according to different criteria Estimate extensions of patterns using data
Year 3	Solve problems involving multiplication and division using a variety of methods Recognise pattern in lists Recognise and find simple fractions of length, shape, objects and quantity Read and write numbers to 1000, with mental calculations of 3 digits Solve problems, including missing number problems Add and subtract simple fractions Know Roman numerals to 100 Solve two step problems using the appropriate operation Multiplication to 12 times table Recognise years in Roman numerals	**SHAPE:** Recognise angles as turns and use the properties of a right angle Begin to recognise and use horizontal, vertical, perpendicular and parallel Compare and classify many geometric shapes using their properties **MEASURE:** Measure, compare, add and subtract different measures **TIME** Compare and sequence intervals of time; Tell and write the time to five minutes **MONEY:** Solve simple money problems in a practical context, including giving change	Interpret and construct simple pictograms, tally charts, block diagrams, charts and tables Ask and answer simple questions from block graphs Choose the form of graph to use Demonstrate results using graphs Schedule predictions using graphical data Calculate amounts using graphs

Maths Overview

Maths Calculation Policy 2021 - 2022

Big Maths

Basic Skills

Learning Gaps

CLIC Fluency

The Rest of the Lesson

Big Maths Beat That

Below is a list of significant individuals who are incorporated throughout our Curriculum who have used mathematical skills and concepts to help pave their careers and achievements.

- Katherine Johnson
- Tim Peake
- The Wright Brothers
- Mae C Jemison
- Mary Anning
- Charles Babbage
- Ada Lovelace
- Archimedes - Measure
- Florence Nightingale - Measure
- Sir Alan Turing
- Christopher Columbus

Mary Anning - Year 2 Dinosaurs

- Mary Anning (1799-1847) was a famous English fossil hunter and collector.

- Despite her poor background and limited education, she was the first to discover and identify many important prehistoric fossils.

- She lived at a time when women were rarely taken seriously in science.

- During her lifetime she received little recognition for her work, despite helping to change our understanding of ancient creatures and evolution.

- Mary used her knowledge of money to sell a range fossils and 'curiosities' to holiday makers as a child. She later opened a shop.

Maths Overview

The Wright Brothers - Year 2 Space

- **The Wright brothers**, Orville and Wilbur, were two American brothers, inventors and aviation pioneers who invented and built the world's first successful airplane and made the first controlled, powered and sustained heavier-than-air human flight, on December 17, 1903.
- They had been experimenting for many years with gliders and other vehicles before their first powered flight.
- They are also known for making the first way to steer an airplane.
- They designed the aircraft in Dayton, Ohio, and their first test flight was in Kitty Hawk, North Carolina.
- They used their knowledge of weight, measures and ability to solve equations to help with their experiments.

The Wright Brothers

Maths Overview
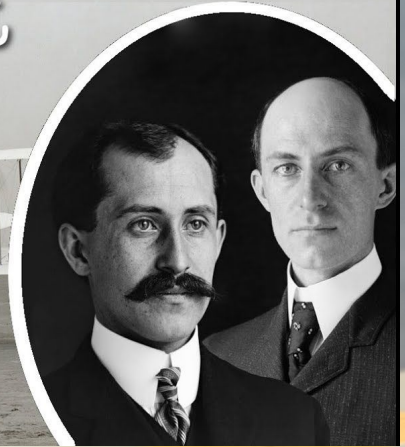
Tim Peake - Year 2 Space

- Tim Peake (1972–) is a British astronaut who became famous when he spent six months living and working on the International Space Station (ISS) in 2015/16. He was the first British astronaut to board the ISS, a laboratory 400 kilometres from Earth.
- Tim telephoned his family from the ISS, but dialled the wrong number by mistake! He asked 79-year-old Betty Barker, 'Hello, is that planet Earth?' She hung up because she thought someone was playing tricks!
- Tim ran the equivalent of the London Marathon on a treadmill on the ISS, on the same day the race took place on Earth. He set the world record for the fastest marathon in space (3 hours, 35 minutes and 21 seconds).
- When he wasn't working, Tim enjoyed taking some amazing photographs from the ISS. One of his favourites was a picture of the Milky Way he took while brushing his teeth!
- Time used his mathematical knowledge of measures, estimation and probability to conduct experiments and solve problems aboard the International Space Station.

Mae C Jemison - Year 2 Space

- Mae C. Jemison is an American astronaut and physician who, on June 4, 1987, became the first African American woman to be admitted into NASA's astronaut training program.
- After more than a year of training, she became the first African American woman astronaut, earning the title of science mission specialist - a job that would make her responsible for conducting crew-related scientific experiments on the space shuttle.
- Mae C. Jemison is the first African American female astronaut. In 1992, she flew into space aboard the Endeavour, becoming the first African American woman in space.
- She used a range of maths skills to conduct experiments on weightlessness whilst in space and also as a GP ensuring the quantities of medicines were correct.

Maths Overview

Christopher Columbus
Year 2 Globe Trotters

He lived over 500 years ago.

- He is remembered as a famous explorer.

Key facts

- Christopher Columbus was a sailor. His first voyage nearly ended in disaster as his ship was attacked and set on fire by pirates! Columbus only survived by swimming to land.
- He became famous as the explorer who found new lands called 'The Americas'. But actually, many people already lived there.
- He found the Americas by accident! He was actually looking for a new way to get to China and India.

Did you know?

- Christopher Columbus is his name in English but he was born in Italy in 1451, so his real name in Italian is Cristoforo Colombo.
- Columbus wasn't popular with his crew. They left him on the island of Jamaica. He nearly starved as the people on the island didn't give him food.
- He brought back pineapples and turkeys from America.

Christopher Columbus' Voyages

Maths Overview
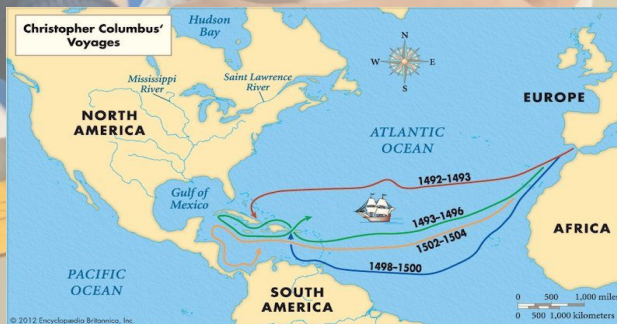
Katherine Johnson - Year 2 Space

- Katherine Johnson was an African American physicist and mathematician.
- She was the first African-American woman to attend graduate school at West Virginia University and is known for her work on the United States' aeronautics and space programs.
- Katherine calculated the trajectory for the 1961 space flight of Alan Shepherd and when computers were first used it was Katherine who checked their calculations were correct!!
- Katherine also worked on the space shuttle program and in the later part of her career spent time inspiring students to follow a STEM Career.
- Katherine worked for NASA for over 30 years and retired in 1986. She passed away in February 2020 at the age of 101.
- Katherine was one of the NASA "human computers". These were women mathematicians who performed calculations that allowed NASA firstly, to put astronauts safely into orbit then onto the Moon!

Ada Lovelace

- Ada Lovelace was an English mathematician and writer.
- She was regarded as the world's first computer programmer.
- In 1836 she wrote the world's first computer program know as an algorithm.
- She sadly died aged 37, but had already made significant contributions to the fields of mathematics and computer science.
- She is still regarded as the first person to understand the potential of a computing machine.
- Without Ada Lovelace, the modern computer and algorithms may not exist.