

Powerful Hornbillers are
positively engaged citizens



Mathematics Policy

September 2022

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Hornbill School's Mission

Our values led, multicultural school promotes a happy, safe & caring environment that is committed to helping all children experience success, whatever their background or abilities. Our children build their learning power as part of a learning community in which they all become resilient & self-assured whilst achieving the highest standards on all they set out to do. The health, safety and wellbeing of every child is our paramount concern.

Building Learning Power

Hornbillers are caring, courteous citizens of Hornbill School who are powerful learners because of their: **curiosity**, **creativity** and **courage** and their **reflective**, **resilient** and **energetic** ability to **communicate** and **explore**.

“Mathematics, a universal language that enables understanding of the world, is an integral part of the curriculum. Beyond the study of numbers, shapes and patterns, it also provides important tools for work in fields such as engineering, physics, architecture, medicine and business. It nurtures the development of a logical and methodical mindset, as well helping to inculcate focus and the ability to solve all manner of problems. Attainment in the subject is also the key to opening new doors to further study and employment.” (School inspection handbook, Ofsted, May 2019)



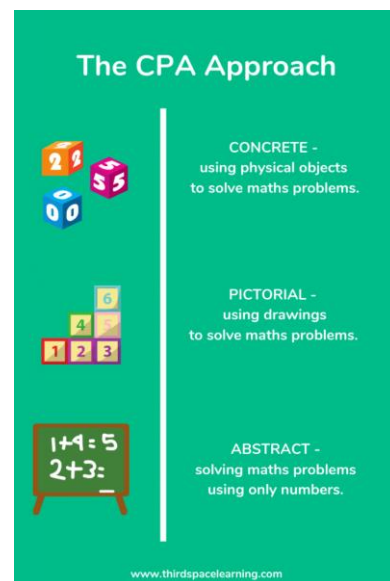
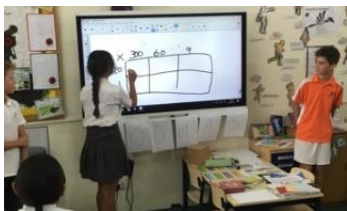
Maths teaching at Hornbill is based upon the **White Rose Maths scheme**, with personalised adaptations made to lessons as appropriate. There is an emphasis on the progressive use of Concrete, Pictorial & Abstract (CPA) methods to ensure a deep understanding of mathematical concepts.

All lessons will clearly include the Learning Powers, used as common learning language across the school.

Our Intention

What does a Hornbill mastery mathematician look like?

Our intention is to be **bold and ambitious** in our mathematics curriculum design, to provide **flexibility with the pupils at the heart** of their mathematical journeys, where the classes/year groups have the diversity to **contextualise the deeper problem-solving** activities around their themes; maintaining a high level of pupil **engagement** and **challenge**.



Our aims are to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- **reason mathematically** by following a line of enquiry, estimating relationships and generalisations, developing arguments, justification or proof using mathematical language.
- can **solve problems** by applying their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

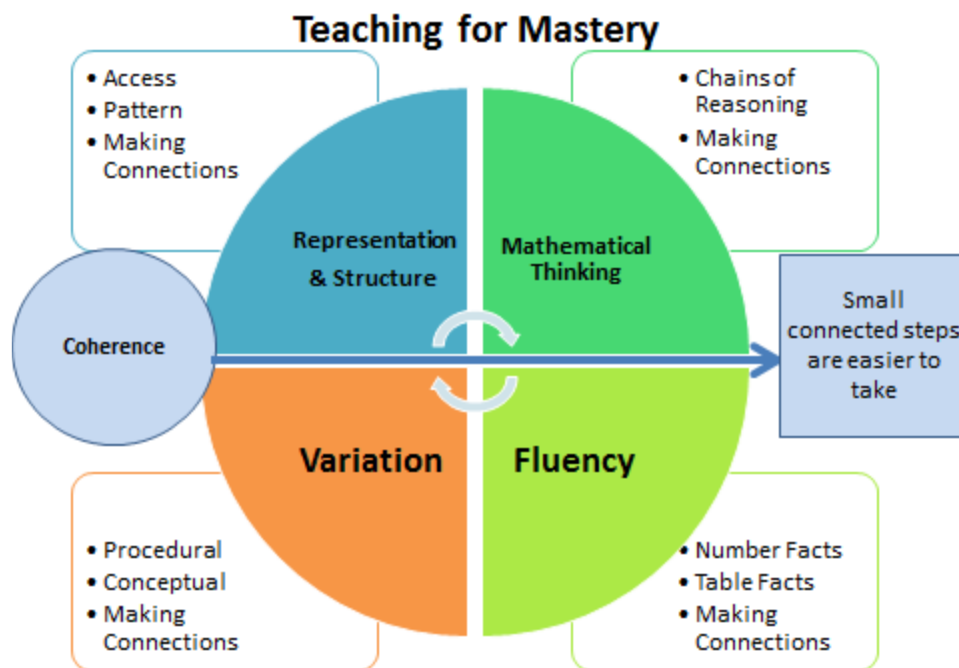
This means that children need to be regularly exposed to opportunities involving increasingly complex problem solving which allows them to apply their Maths knowledge. In doing so they should be encouraged to develop an argument and line of enquiry which they can prove and justify using mathematical vocabulary. This includes the ability to break down problems, both routine and non-routine, into a series of steps.

A Hornbill Mathematician will develop the following characteristics during their time with us. Pupils will:

- **Make connections** between their mathematics.
- Apply a range of **skills** when problem solving.
- Be **fluent** with **number facts** and the number system.
- Be **fluent** with **written** and **mental** calculation strategies.



- Use their **initiative** within a range of contexts.
- Think **independently**, building **resilience** within challenges to develop **confidence**.
- Embrace the value of learning from mistakes in a **growth mindset**.
- **Reason**, generalise and make sense of solutions.
- Develop **commitment** and **passion** for the subject.
- Become **visualisers** with the CPA approach and **describers** by providing a large emphasis on mathematical language and questioning.



What do we believe as 'mastery' in mathematics at Hornbill?

The approaches we use have an emphasis on **success for all** and that this can be achieved by **developing conceptual understanding**, with a focus on mathematical structures. We strive in keeping the whole class together, not moving on until ideas are understood, promoting concepts through a variety of representations at all levels of understanding. We do this through a range of **concrete, pictorial** and **abstract** variations in our activities.

NCETM (National Centre for Teaching Excellence in Mathematics)

The National Curriculum suggests that pupils should be moved on only when they are conceptually ready and that pupils who have grasped concepts quickly, will be given '**rich and sophisticated problems** before any acceleration through new content.' (DfE, 2013). This demonstrates that, within the curriculum, there is clear acknowledgement that not all children will develop a particular concept at the same rate.

Meeting the Needs of all our Learners

To support individual needs our teaching team of staff support the development of our pupils through:

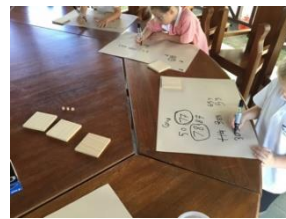
- Skillful questioning within lessons to promote conceptual understanding.
- Scaffolding to support individual pupils if needed.
- Identifying and rapidly acting on misconceptions which arise through same day intervention
- Challenging, through rich and sophisticated problems for those pupils who grasp concepts rapidly, before any acceleration through new content.
- Use of concrete, pictorial and abstract representations according to levels of development.
- Support to consolidate understanding before moving on.

Implementation - How do we do it?

Skillful use by our teachers to use a variety of representations for pupils, enables pupils themselves to represent mathematical understanding in different ways, is part of effective teaching. Each lesson focusses on one clear learning objective which all children are expected to master; extension activities enable those children who grasp the objective rapidly to extend their learning by exploring it at greater depth. The lessons include elements of: fluency, to practise skills; reasoning, to deepen understanding; and problem solving, to apply skills depending on the objective being taught and the understanding of the children.

Whole class teaching is adopted and children work in mixed ability groups. We believe that all children should have the same standard of teaching and to ensure this we aim not to group children based on their ability but also accept that at times this may be necessary. We therefore aim to differentiate via outcome rather than work set. Additionally, our teachers are highly committed to enhancing their subject knowledge by maintaining up to date knowledge on the current curriculum changes and by professional training e.g. White Rose Mastery training in Y1 -Y6 and Karen wilding training in the foundation stage.

Children should be recording independently where possible this should make pupils think, be above their current attainment, deepen their understanding of previous content and prepare the ground for new understanding



Our teaching team have access to, and use a range of resources to support their planning and implementation of teaching and learning of mathematics towards curriculum milestones. We are predominantly guided by: White Rose Resources (FS2 – Year 6) and The National Centre for Excellence in the Teaching of Mathematics. Within FS1, we are following the Karen Wilding approach.



Reflection has been noted as a real strength of our school in recent years as we develop our mathematics curriculum. *‘Teachers are both reflective and professional. Keen to be excellent but not rest on laurels; this is a real hallmark of Hornbill. Relationships in class are outstanding and conducive to learning.’* Andrew Jeffrey

Community

Parental and community partnerships are important in our drive to raise the attainment of our pupils. We support our community through Family Learning Programmes on a termly basis. Furthermore, our pupils use garrison community links and classroom partnership activities to build mathematical understanding together.

What impact are we having on our learners?

Hornbill pupils consistently achieve well in Key Stage assessments in comparison to national averages. Our key intent is always to raise the attainment and improve upon the outcomes for our pupils, who join and leave us during regiment transitions. We strive to develop enthusiastic, confident and competent mathematicians, who achieve well in key milestones and beyond, with a skill-set to build on as life-long mathematicians. Our pupils enjoy the subject and make good or better progress during their time with us across all levels of entry.

Policy updated: **October 2022**

Next Policy update will be: **October 2023**