Holy Cross Primary
Catholic Voluntary Academy

Loved, Valued, Challenged

OUR LADY OF LOURDES
CATHOLIC MULTI-ACADEMY TRUST

MATHS

POLICY

Signed: Tammie McNamara (Headteacher) Date: Nov 2021

Signed: Maria Williams (Chair of Governors) Date: Nov 2021

November 2021

Date of next review November 2022

Our Mission Statement

Loved
We love one another as Jesus taught us - our friends, our families and those who we may never meet.
Valued
We value everyone - everyone is important; pupils, staff, parents, governors and members of the community– no matter their race, religion ability or need. We try to live like Jesus taught us.
Challenged
We challenge each other - not only with our learning but challenge each other to be more merciful to others, have a little more understanding of others' needs and challenge each other to be better people.

Statement of Intent
Mathematics equips pupils with the uniquely powerful set of tools to understand
and change the world. These tools include logical reasoning, problem solving skills and the ability to think in abstract ways.
Mathematics is important in everyday life. It is integral to all aspects of life and with this in mind we endeavour to ensure that children develop a healthy and enthusiastic attitude towards mathematics that will stay with them, throughout their life.

Inclusion Statement
The Governors are committed to `inclusion` in education: this involves minimizing barriers to learning and participation. At our school we believe all children should be valued equally within a climate of warmth and support and in which all pupils feel it is okay to take risks and make mistakes as they learn.
Equal Opportunity Statement
The Governors and Staff at Holy Cross believe that all people are entitled to equal opportunities, respect and consideration regardless of race, colour, creed, gender, disability or personal circumstances. Therefore, we are opposed to any form of prejudice or discrimination which denies people this equality. This principle applies to both adults and children in our school.

The New Curriculum
The old strands have been abolished and it is now set out into 6 sections with
a larger focus on number throughout the key stages

- **Number** – including Number and Place Value, Addition and Subtraction, Multiplication, Division and fractions -including Decimals (Year 4, 5 and 6) and Percentages (Year 5 and 6)
- **Measurement**
- **Ratio and Proportion** (Year 6 only)
- **Algebra** (year 6)
- **Geometry** – including Position and Direction
- **Statistics**

By the time the children are at the end of Year 3 they must be able to use a formal written method for all operations and the differentiated outcomes throughout the years will be the size of the numbers the children are using.

A large proportion of number skills, formerly from Key Stage 3, have been moved into Year 6 and children are now asked to carry out long division, adding, subtracting and multiplying of fractions with common denominators. Topics such as Probability have been removed.

Aims

The aims for teaching mathematics at Holy Cross are that pupils should:

- ✓ Have a sense of the size of a number and where it fits into the number system.
- ✓ Know by heart number facts such as number bonds, multiplication tables and doubles and halves of both whole numbers and decimals (year 6).
- ✓ Use what they know by heart to figure out numbers mentally using the four operations.
- ✓ Calculate accurately and efficiently, both mentally and on paper, drawing on a range of calculation strategies.
- ✓ Make sense of 'real life' maths problems and recognise the operations and steps needed to solve them.
- ✓ Explain their methods and reasoning using correct mathematical vocabulary.
- ✓ Judge whether their answers are reasonable and have strategies for checking them where necessary.
- ✓ Know units for measuring and make sensible estimations of measures.
- ✓ Explain and make predictions from numbers in graphs, diagrams, charts and tables.
- ✓ Develop spatial awareness and an understanding of the properties of 2D and 3D shapes.
- ✓ Be able to recognise and write simple fractions, solving problems with fractions of shape and number

How do we teach Maths at Holy Cross?

At Holy Cross Primary School, we use White Rose Maths schemes of learning, and a modified version of their resources in order to provide a comprehensive and expertly designed journey though the world of Mathematics. White Rose is based on a small steps approach that keeps all learners together. By using the resources across the school we can ensure consistency of the mathematical elements and comprehensive coverage of the curriculum. We believe that this approach will facilitate consistent delivery of Mathematics across the school and across the inevitable ability range within year groups. It is also designed to support mathematicians who require more time and visual representation to grasp fundamental concepts and those who require challenging further to achieve Greater Depth.

White Rose Resources support us to provide:

- CPA (Concrete / Pictoral / Abstract) representations.
- Variation (Procedural / Conceptural).
- Logical and effective small steps.
- Vocabulary.
- Manipulative usage.

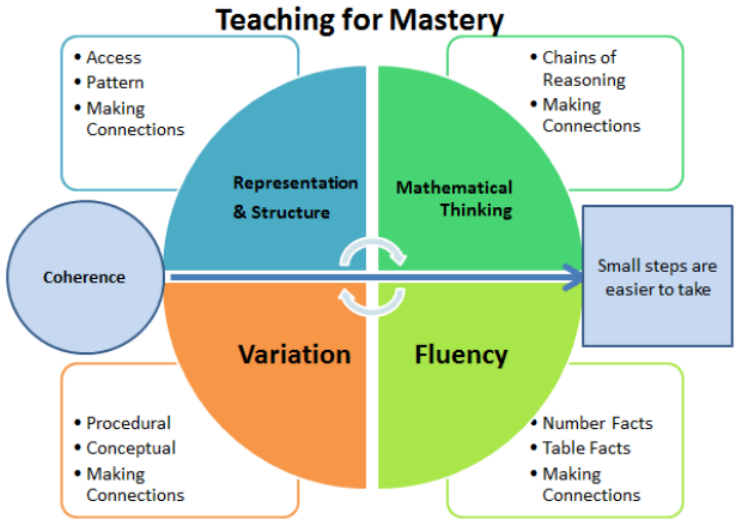
White Rose resources support:

- All learners through a whole class learning approach.
- EYFS stage learning.
- Visual representation designed to show concepts clearly.
- Re-visiting of concepts.
- Bar models and PPW models for problem solving.
- Clear progression of calculation.
- Fluency of calculation and concept with 'Flashback 4' questions

Manipulatives are:

- Used purposefully and appropriately.

• They are available for appropriate lessons – this builds a mental picture of a mathematical concept.
• Manipulative use develops through concepts as the learner moves from EYFS to Y6
White Rose uses the Teaching for Mastery model as illustrated below. This has been developed by the NCETM
NCETM 'Teaching for mastery'



Pupils with special educational needs and Pupil Passports

Teachers will aim to include and engage all pupils fully in their daily mathematics lessons. Children will benefit from the increased emphasis on oral and mental work and participation in watching and listening to other children demonstrating and explaining their methods. Children will receive differentiated group work and focused group teaching with the teacher and TA most weeks. However, a pupil whose difficulties are severe or complex, may need to be supported with an individualised programme in the main part of the lesson.

Principal Aims for EYFS

EYFS follow the White Rose schemes of learning – principally securing the representations of numbers up to 10 and recognising number to 20. Children are encouraged to spot patterns and identify differences through variation. EYFS children begin their fluency journey by noticing and recalling numbers up to 20. EYFS practise is predicated on exploration and discovery with songs and repetition to secure foundational knowledge.

Principal Aims for KS1

The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources [for example, concrete objects and measuring tools].

At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.

Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

Principal Aims for Lower KS2

The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.

By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.

Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

Principal Aims for Upper KS2

The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.

At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and long division, and in working with fractions, decimals and percentages.

Pupils should read, spell and pronounce mathematical vocabulary correctly.

Assessment and recording

Assessment is regarded as an integral part of teaching and learning and is a continuous process. It is the responsibility of the class teacher to assess all pupils in their class and to keep records.
These assessments inform the planning and teaching at each level and also inform target setting and tracking.

Short term assessments

These are informal. They feed into the day-to-day teaching and planning and help target support to individual children. Informal notes may be kept, particularly on children whose performance is out of the ordinary.

Medium and long term assessment

Teachers use an assessment tracking grid to help them give feedback to parents through reports and parents' evenings as well as giving specific, clear, detailed feedback about the child's progress to their next teacher or school. These on-going teacher assessments, which are to be supported by the White Rose assessments which are to be done at the beginning and end of each topic and are used to make judgements about the level a child has reached and inform the school's tracking system 3 times a year.

With the new framework in numeracy being introduced the White Rose assessment tasks will ensure that children have understood each topic so that gaps and misconceptions can be addressed in a timely fashion. The assessments will be completed at the beginning at the end of each topic so children who already understand the task can be challenged and progress can be shown over each topic.

Monitoring and Review

It is the responsibility of the numeracy subject leader to:

- Monitor the standards of children's work and the quality of teaching in numeracy, through scrutiny of work, observations of lessons and pupil interviews.
- Support colleagues in the teaching of numeracy, being informed about current developments in the subject and for providing a strategic lead and direction for the subject in the school.
- Report regularly on the achievements and standards and the quality of the provision in numeracy across the school.
- Review, order and maintain resources required for the teaching of maths.

Presentation

All work should be dated, with the WALT stuck or written in, and should be well-presented according to the level the children have reached. Pencils and rulers should be used in numeracy books and children should stick to the one number per each box presentation rule. Numbers should be written in a uniformed manner and with no loops.

Layout expected for each piece of maths work completed:

04.11.21

Flashback 4

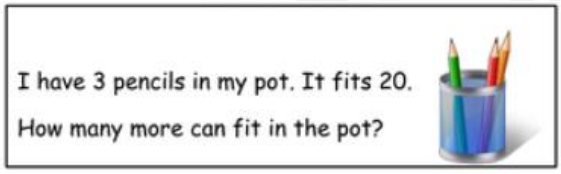
1. 1+1=2
2. 2+2=4
3. 3+3=6
4. 4+4=8

WALT: number bonds to 20

Fluency

1. 1+19=20
2. 2+18=20
3. 3+17=20

R & PS/ Reasoning and problem solving



There will be 17 more pencils that can fit in the pot, I know this because 20-3 = 17

Maths Leader will:

- Monitor numeracy in the school e.g. through lesson observations termly.
- Curriculum walks and the scrutiny of tracker, children's work, teachers' planning and assessments.
- Ensure continuity in assessment throughout the school and lead practical staff meetings to support this.
- Keep up to date with new developments and keep the staff informed.
- Play a key role in formulating, maintaining and reviewing the numeracy policy.
- Lead colleagues and be supportive.
- Disseminate knowledge and materials.
- Audit resources regularly.

The Class teacher will:

- Be responsible for the teaching of Numeracy as set out in the policy.
- Provide planning and reviews for the Head teacher and numeracy leader to have access to.
- Provide samples of numeracy work to the numeracy leader when required.
- Assess children's work in order to detail future planning.

Key Stage 2 Maths Book Expectations

We follow the White Rose Maths Scheme of learning supplemented by Twinkl, Classroom Secrets, Deepening Understanding, TTRS and any other resources.

Presentation

All work should be dated with a clear and concise WALT (taken straight from White Rose)

Pupils should use one number for one square at all times unless writing fractions – from year 4 onwards both the denominator and the numerator should be written in one square to help prepare for mixed fractions.

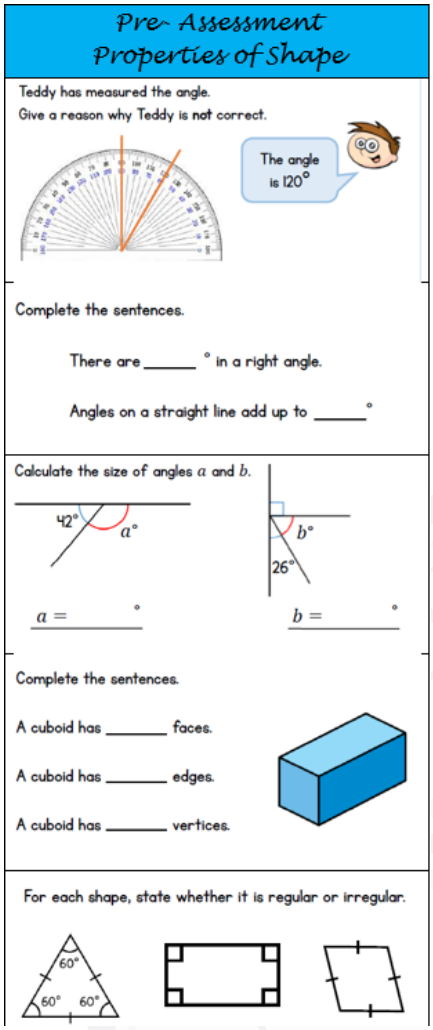
The majority of the work should be written straight into books with allowances made for geometry, measurement, fractions and money units.

Rulers should be used to draw straight lines within the book and rubbing out should be kept to a minimum.

Years 5 and 6 will draw a margin in their books for each new page, no smaller than 3 squares but no bigger than 5 squares.

Pre and Post Assessments

All units should start with a pre- assessment which is BLUE in colour.



Pre- Assessment
Properties of Shape

Teddy has measured the angle.
Give a reason why Teddy is not correct.

The angle is 120°

Complete the sentences.

There are _____ ° in a right angle.

Angles on a straight line add up to _____°

Calculate the size of angles a and b.

42° a°

b° 26°

a = ° b = °

Complete the sentences.

A cuboid has _____ faces.

A cuboid has _____ edges.

A cuboid has _____ vertices.

For each shape, state whether it is regular or irregular.

60° 60° 60°

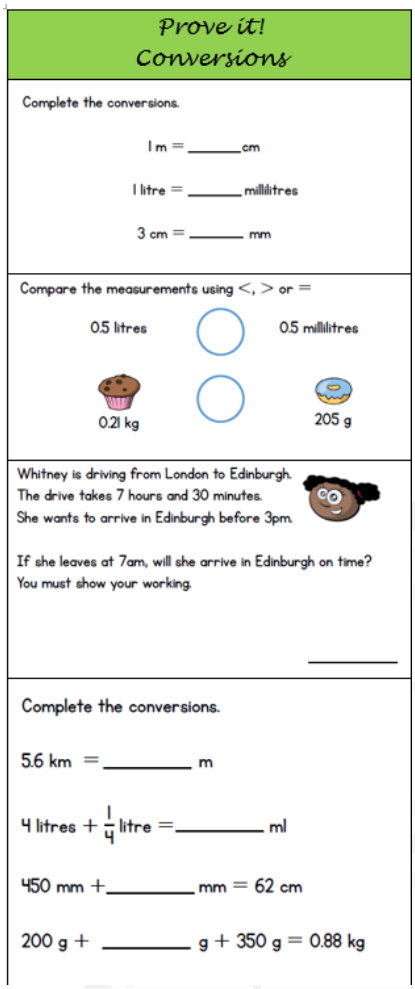
Pre-unit Assessments should have a selection of questions taken from previous learning units on the same strand and from the unit you are about to teach – end of block assessments are very useful for this.

This allows the teachers to assess quickly where each pupil is and where they will start on objectives (fluency, reasoning or problem solving)

Teachers should highlight each question, green if correct, orange if incorrect, left blank if the pupil leaves the question.

The leaves should be stuck on the left-hand side of the page leaving room for working out. You can ascertain misconceptions from the working out.

Pre- assessments should take no longer than 15 minutes. They can be self-marked then highlighted by the teacher or teacher marked.



Prove it!
Conversions

Complete the conversions.

1 m = _____ cm

1 litre = _____ millilitres

3 cm = _____ mm

Compare the measurements using <, > or =

0.5 litres ◯ 0.5 millilitres

0.21 kg ◯ 205 g

Whitney is driving from London to Edinburgh.
The drive takes 7 hours and 30 minutes.
She wants to arrive in Edinburgh before 3pm.

If she leaves at 7am, will she arrive in Edinburgh on time?
You must show your working.

_____

Complete the conversions.

5.6 km = _____ m

4 litres + $\frac{1}{4}$ litre = _____ ml

450 mm + _____ mm = 62 cm

200 g + _____ g + 350 g = 0.88 kg

Post Assessments should be green in colour.

These should be completed a few days after you have completed the unit, stuck in the books in the same manner as the Pre- Assessments and each question highlighted by the teacher.

The questions between the pre and post assessments should be reflective of each other so clear progress can be seen by the pupil.

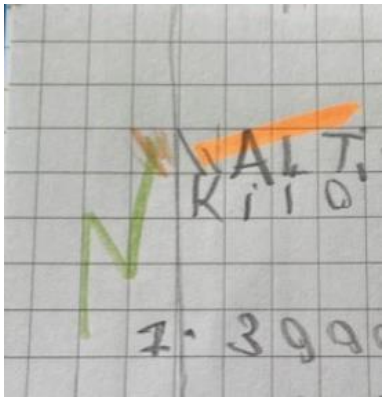
The questions that most frequently incorrect on the post assessments must be noted using the whole class feedback sheet and used to inform the class teachers retrieval practice flash backs.

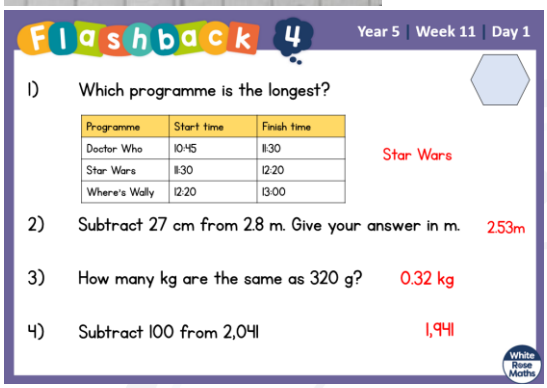
<u>Flashbacks</u>

Each maths lesson should start with a flashback. This is your retrieval practise, if you don't use a skill you lose the skill.

White Rose maths Flashbacks can be used, however these are not necessarily aimed to your classes needs. If areas of weaknesses have been identified on Post Assessments, these must be included.

Flashbacks and retrieval Practice should be noted by a simple flash in pencil crayon in the books as seen in the picture below. The flash should be no bigger than 3 7mm squares (2 1cm squares).





Self-Assessment

Pupils should still be self-assessing their work in each lesson- green for I understood the work and am feeling confident and orange for not so. Ideally no reds should be used as teacher should have picked this up during the lesson.

Self-assessment should be completed in pencil crayon next to the WALT.

Fluency, Reasoning and Problem Solving.

Each part of the lesson should be clearly defined in the pupils books. Pupils are to write, fluency, reasoning and problem solving as headings as they get to that part of the work.

Pupils who achieved well in pre-assessments should have very little, if any fluency work. Key Stage 2 pupils should be trained to do this. To ease teacher workload, the headings can be written onto printed worksheets, text book pages for the pupils to write down.

Concrete, Pictorial and Abstract.

When learning a new concept, it is expected that the books clearly show the progression from concrete manipulatives, to pictorial representations to the formal abstract methods. Each pupil should have access to place value counters and other manipulative is KS2.

Sentence Stems for reasoning should be on display in each KS2 classroom, either as a working wall or in the pupils books so the pupils are used to using and seeing them.

Feedback

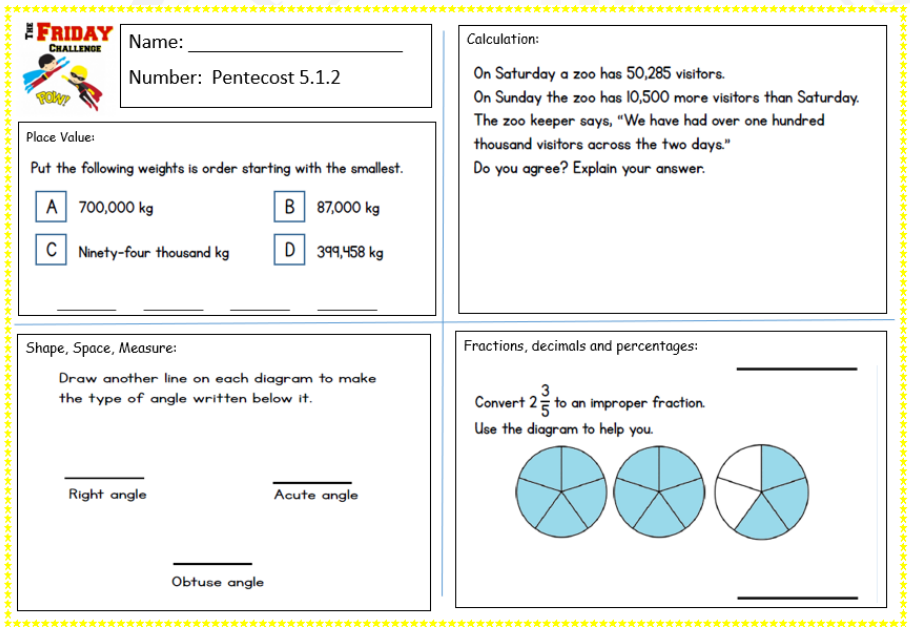
Feedback should be in line with the whole school marking policy. Any errors should be corrected by the pupil in green pen and in years 5 and 6 a brief explanation of why they think they got the question incorrect. This can be modelled by using a visualiser.

As per policy, the WALT should be highlighted either green or orange.

If for instance pupils all had a common error of not explaining an answer fully or struggled to show working out, this should be noted on the whole class marking sheet and modelled in the next session. Clear correlation should be seen from the marking sheet to the pupils books.

Friday Challenges

Friday challenges should be completed weekly in four main parts:



These should be reflective of the pupils' needs.