What does maths look like at Anlaby Primary School?

Developing a Mastery Curriculum:

At Anlaby Primary School, all teachers believe that all pupils are capable of achieving high standards and challenge is part of everyday maths for all pupils and therefore our maths curriculum incorporates the key elements of the mastery curriculum: **Fluency, Mathematical Reasoning and Problem Solving**. Mastery teaching addresses the needs of all pupils on a daily basis; support is provided through same day intervention for those who did not grasp concepts and challenge is provided through depth of both planned activities and higher order questioning for those for whom concepts were well understood.

Planning for Mastery is developing through years 1 to 6 and is supported by the Maths Subject Leaders, the Yorkshire and Humber Maths Hub, use of the White Rose Medium Term plans and assessment materials, NCETM resources/teaching for mastery, Big Maths resources and the Maths No Problem Books.

Fluency

We aim to ensure that all pupils become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time. Oral Mental Maths is a feature of every day learning to ensure pupils develop the ability to retrieve number facts rapidly; catch-up and differentiated sessions are planned for pupils as required. Times table activities and tests are routine from Year 1 upwards. (Year 1 begin Times Tables Journeys in the Spring Term)

Through the Mastery approach, we provide all children with the opportunity to develop procedural and conceptual fluency. Children are required to reason and make connections between calculations. The connections made improve their fluency.

For example: Don't count, calculate
Young children benefit from being helped at an early stage to start calculating, rather than relying on 'counting on' as a way of calculating. For example, with a calculation such as:

4 + 7 =

Rather than starting at 4 and counting on 7, children could use their knowledge and bridge to 10 to deduce that because 4 + 6 = 10, so 4 + 7 must equal 11.

Reasoning (mathematical thinking)

Reasoning is used to support mathematical thinking in all year groups. All children are expected to respond using mathematical vocabulary in full sentences explaining their thinking. Through reasoning, children are able to extend their understanding beyond arithmetic.

For example: Consecutive numbers

If I add three consecutive numbers, will I get an odd or an even answer?

Children might use apparatus to explore this.
How can I prove that I am right?
Ideas such as this can be explored with increasing depth as children progress through school and their reasoning skills develop.

Or another example might be:

True or false

A mixed number is not a whole number.

Explain why?

Problem Solving:

Children are given opportunities to apply their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.
Planning ensures that problems are designed to deepen children's understanding of essential concepts through 'intelligent practice' or 'variation'.

For example: Developing children's understanding of the = symbol

The symbol = is an assertion of equivalence. If we write: 3 + 4 = 6 + 1 then we are saying that what is on the left of the = symbol is necessarily equivalent to what is on the right of the symbol. But many children interpret = as being simply an instruction to evaluate a calculation, as a result of always seeing it used thus:
3 + 4 = 5 × 7 = 16 – 9 =

If children only think of = as meaning "work out the answer to this calculation", then they are likely to get confused by empty box questions such as:
3 + □ = 8 or 12 - □ = 5
Later they are very likely to struggle with even simple algebraic equations, such as:
3y = 18
Therefore children are taught to answer empty box problems with variation of the position of the = sign from an early age.

The Anlaby Primary School Three Steps To Mathematical Mastery

Fluency ➔ ➔ ➔	**Reasoning** ➔ ➔ ➔	**Problem Solving**
Jemima has a toy car measuring 8cm. Aisha has a toy train that is 8 times as long as the car. How long is the train?	12 buns are shared between 3 boys. 16 buns are shared between 4 girls. Who gets more buns, boys or girls? Explain your answer.	William has 3 t-shirts and 4 pairs of trousers. How many outfits can he make?

Fluency ➔ ➔ ➔	**Reasoning** ➔ ➔ ➔	**Problem Solving**
Solve: 25 ÷ 4 = 237 ÷ 4 = 9462 ÷ 8 =	True or false? The only number that divides to give an answer with 1 decimal place is 2. Prove it.	Find the smallest number that can be added to 92 to make it exactly divisible by 7. How about 8?

FLUENCY ➔➔➔➔➔➔ REASONING ➔➔➔➔➔➔ PROBLEM SOLVING