

The background features abstract, overlapping geometric shapes in various shades of green, ranging from light lime to dark forest green. The shapes are primarily triangles and polygons, creating a dynamic, layered effect. The text is centered in a clean, sans-serif font.

Teaching maths at Roseberry
through
'Challenge by Choice'

Current thinking about differentiation and challenge

- OFSTED - Where teaching is Good or Outstanding...
- Teachers and other staff have consistently high expectations of what each pupil can achieve, including disadvantaged pupils and the most able
- Assessment information is used to plan appropriate teaching and learning strategies, including to identify pupils who are falling behind in their learning or who need additional support
- Work in all year groups is demanding enough for all pupils
- Pupils' knowledge, understanding and skills develop and improve over time
- There is an appropriate level of challenge and pupils have to grapple appropriately with content, not necessarily 'getting it right' first time, which could be evidence that the work is too easy

Mathematics National Curriculum

- ▶ The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace.
- ▶ Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on'

The 3 aims of the Maths Curriculum are that all learners should:

- ▶ Become fluent in the fundamentals of maths through varied and frequent practise with increasingly complex problems over time, so that pupils develop conceptual understanding
- ▶ Be able to reason mathematically
- ▶ Be able to solve problems

Research on Mastery

- Teachers reinforce an expectation that all pupils are capable of achieving high standards in mathematics.
- The large majority of pupils progress through the curriculum content at the same pace. Differentiation is achieved by emphasising deep knowledge and through individual support and intervention.
- Teaching is underpinned by methodical curriculum design and supported by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge.
- Practice and consolidation play a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts in tandem.

What does Challenge By Choice in maths look like?

- ▶ Children have the opportunity to choose a task suitable for their level of understanding on that day (Challenge 1, 2, 3 and then a Chilli Challenge)
- ▶ Challenge 1 involves skills taught within the lesson, but should (where appropriate) try to include a reasoning/problem solving question towards the end
- ▶ Challenge 2 involves skills taught within the lesson, presented in different ways (variation) with reasoning and problem solving questions towards the end
- ▶ Challenge 3 can involve a few skill based questions, but the majority of their challenges should be reasoning/problem solving/mastery questions, as they have shown to be able to master the skill within the input.
- ▶ Chilli challenge is a mastery based question(s).

How does it work?

- ▶ It works because it removes a barrier that stops children being able to achieve things based on teachers' preconceptions of what they could achieve
- ▶ The children have ownership of their learning - there is a different task design for children of all abilities, even though they are working on the same objective.
- ▶ It means children (after training) select the correct challenge throughout the lesson
- ▶ Reasoning and problem solving are included throughout, and this allows children to go deeper whilst also becoming fluent if they need more practise in a given area

Year 4/5 example...

Challenge 1

Estimate the answers to these questions by rounding to the nearest **10**, and then check your answers using the inverse operation.

Record your working out in your books.

- 1) $43 + 36$
- 2) $81 + 62$
- 3) $155 + 29$

Estimate the answers to these questions by rounding to the nearest **100**, and then check your answers using the inverse operation.

Record your working out in your books.

- 4) $567 + 321$
- 5) $5675 + 4567$
- 6) $7643 + 6543$

Estimate the answers to these questions by rounding to the nearest **1000**, and then check your answers using the inverse operation.

Record your working out in your books.

- 7) $4987 + 2897$
- 8) $4789 + 3281$
- 9) $7892 + 2341$

Challenge 2

1. Estimate the answer to this question by rounding to the nearest **10**, **100** and **1000** and then check your answers using the inverse operation.

$$2543 + 3236$$



Nearest 10	Inverse operation	Nearest 100	Inverse operation	Nearest 1000	Inverse operation

2. Match the calculation below with a good estimate (draw lines in coloured pencil).

Calculation	Estimate
$5430 + 2865$	$3000 + 5000$
$567 + 123$	$5000 + 5000$
$2988 + 4982$	$1200 + 5000$
$5123 + 4898$	$700 + 150$
$1203 + 4999$	$5400 + 2900$
$702 + 162$	$550 + 100$

3. Decide whether to round to the nearest 10, 100 or 1000 and estimate the answers. Show your working out in your book.

$$4623 + 3421$$

$$9732 - 6489$$

$$8934 - 1187$$

Challenge 3

- Decide whether to round to the nearest 10, 100 or 1,000 and estimate the answers.

$4,623 + 3,421$ $9,732 - 6,489$ $8,934 - 1,187$

- 6* Record your working out to this question in your books (name it question 1).

The estimated answer to a calculation is 3,400

The numbers in the calculation were rounded to the nearest 100 to find an estimate.

What could the numbers be in the original calculation?

Use the number cards and + or - to make three calculations with an estimated answer of 2,500

1,295	1,120
4,002	1,489
3,812	1,449

What happens in EYFS?

- ▶ EYFS start the year by focusing on a number. They revolve all the early teaching and learning around this so if they are looking at 5, they will also look at pentagons, 5p, 5 o'clock, etc. In doing this, the children get a deep understanding of the abstract concept of 5 and they are able to use high level language exceptionally well.
- ▶ They also look at what is NOT that number. It is working really well because concepts such as time, money and shape are all taught within the number they connect to and is making the learning 'stick'.

What do Year 4/5 children think?

Some quotes...

- ▶ You can work at your own level now, not everybody does the same.
- ▶ I like the fact there's lots of challenges to choose from, you can never finish, there's always another problem to solve.
- ▶ Maths didn't used to excite me, now its more challenging as you can choose the challenge that's right for you.
- ▶ I used to whizz through the sheets, but now there's a Chilli Challenge for me, this is great!
- ▶ I'm a lot more confident now, and this makes me feel happy inside.