National Curriculum Presentations

Maths and literacy in the new curriculum

Presenters: Rebecca Cosgrave and Ruth Trundley
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Key Questions:

• What do I have to teach?
• How do I approach the new curriculum?
• What are the key aspects of the new curriculum in English and mathematics?
• How do I make effective links across the curriculum?
The National Curriculum

The key stage 2 programmes of study for English, mathematics and science are presented in this document as ‘lower’ (years 3 and 4) and ‘upper’ (years 5 and 6). This distinction is made as guidance for teachers and is not reflected in legislation. **The legal requirement is to cover the content of the programmes of study for years 3 to 6 by the end of key stage 2.**
The programmes of study for mathematics are set out year-by-year for key stages 1 and 2. **Schools are, however, only required to teach the relevant programme of study by the end of the key stage.** Within each key stage, schools therefore have the flexibility to introduce content earlier or later than set out in the programme of study. In addition, schools can introduce key stage content during an earlier key stage, if appropriate. All schools must publish their school curriculum by subject and academic year, online.
Compliance or growth?

IMPLEMENT
Checklists
Procedures to follow
Climates of compliance

GROW
Responsiveness
Principles
Climates of growth
• Write clearly, accurately and coherently, adapting their language and style in and for a range of contexts, purposes and audiences
• Use discussion in order to learn
• Acquire a wide vocabulary, an understanding of grammar and knowledge of linguistic conventions
• Read easily, fluently and with good understanding
• Develop the habit of reading widely and often, for both pleasure and information
• Appreciate our rich and varied literary heritage
Thinking is at the heart of mathematics and therefore should be at the heart of mathematical teaching and learning.
Symbols

Language

Context

Mathematical image/picture

Adapted from Derek Haylock and Anne Cockburn 2003
National Curriculum - aims

- 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, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

- can **solve problems** by applying 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.
Fluency is more than memorization of procedures and facts.

• an understanding of the meaning of the operations and their relationships to each other -- for example, the inverse relationship between multiplication and division;

• the knowledge of a large repertoire of number relationships, including the addition and multiplication "facts" as well as other relationships, such as how $4 \times 5$ is related to $4 \times 50$;

• a thorough understanding of the base ten number system, how numbers are structured in this system, and how the place value system of numbers behaves in different operations – for example, that $24 + 10 = 34$ or $24 \times 10 = 240$. (Russell 2000)

Plus – decision making
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Key aspects of the new curriculum

English:

• Focus on essential skills
  • Grammar
  • Spelling
• Phonics
• Reading for pleasure
• Movement from coverage to process
Key aspects of the new curriculum

Maths:
• Domains
• Using and applying
• Content and expectations
• Planning a route
Progression in Calculation

- No detail for mental calculation
- Structures of operations are scattered between statutory, non-statutory and non-existent
- Language is missing (some in non-statutory)
- Representation is mentioned but without any detail of what to use where and why
- Context is not mentioned in the calculation programmes of study and links need to be made to measures, statistics and cross-curricular contexts
Calculation Policy

• What does your policy look like?
• Have you changed it in light of the National Curriculum? If so, what have you done and how have you done it?
• Does your policy include:
  • Decision making (choose and use appropriate)
    – Efficiency
    – Checking
    – Estimating
  • Images
  • Contexts (measures, statistics, cross-curricular etc.)
  • Language
Key aspects of the new curriculum

Maths:

- Domains
- Using and applying
- Content and Expectations
- Planning a route
Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.
Planning a route

Themes:

- Number Sense
- Additive Reasoning
- Multiplicative Reasoning
- Geometric Reasoning

These themes make clear connections between areas of maths, encouraging children to use what they know and understand rather than treating each area of maths as separate and unconnected.

Reference:
Primary Mathematics Planning Framework Babcock LDP/Rising Stars
Making links

Teachers should develop pupils’ spoken language, reading, writing and vocabulary as integral aspects of the teaching of every subject. English is both a subject in its own right and the medium for teaching; for pupils, understanding the language provides access to the whole curriculum. Fluency in the English language is an essential foundation for success in all subjects.
Making links

Teachers should use every relevant subject to develop pupils’ mathematical fluency. Confidence in numeracy and other mathematical skills is a precondition of success across the national curriculum. Teachers should develop pupils’ numeracy and mathematical reasoning in all subjects so that they understand and appreciate the importance of mathematics.
Approaches to making links

• Teaching concurrently
• Directly teach an aspect of literacy/maths in another subject
• Using and applying mathematical/literacy skills – planned and incidental
• Use of literacy/maths teaching strategies in other curriculum areas
• Homework
Art: Black and White
- Develop mastery of techniques in monochrome (charcoal/pencil/pen and ink/paint)
- Link to great artist: Picasso perhaps and his Black and White works

Literacy:
- non chronological reports: Penguins Non Chron report about local birds
- Poetry: kennings (Posy) Penguin Kenning
- Persuasive writing (Protect the penguin habitat)

Maths:
- 365 Penguins as a core text
- Data handling linked to statistics about penguin habitat and distribution
- Consider relevant contexts when planning for maths sequences

PE:Dance
Explore Rockhopper challenge through dance using technical dance elements and choreographic structure.

Science:
Y4: Living things and their Habitats (recognise that environments can change which can pose dangers to living things?)
Y3: Animals Including Humans: What do Penguins need to survive and how are they adapted to their environment? Perhaps apply/contrast this then to examination of a locally occurring marine bird? States of Matter - observe that some materials change state when heated or cooled and investigate the temperature at which this happens

Explanatory write:
How to Keep a Penguin Alive

Geography:
Locational Knowledge:
- Explore and use maps to identify penguin habitats, (South America and the environmental regions suited to Penguins). Link this to position and significance of latitude/longitude
- Place Knowledge: similarities and differences between Devon marine environment and south American location.
- Human and Physical Geography:
  - Physical geography: climate zones
  - Climate zones and biomes/vegetation zones.
  - Why are there no penguins in the Arctic?
Multiplicative reasoning

Pupils can explain the relationship between multiplication, division and fractions. They use this understanding to derive facts and solve problems.

*I can explain and represent…what happens if you share four bars of chocolate fairly between seven people.*

Primary Mathematics Planning Framework

Babcock LDP/Rising Stars
Where should the penguin go?
Approaches to making links

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