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BRITISH COUNCIL | Colombia

Cambridge Primary and Lower Secondary programme: A short overview

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What will I cover today?

- An overview of the Cambridge Primary and Lower Secondary programme
- How our programme supports 21st century teaching and learning
- Questions

The Cambridge Pathway 2021

Primary and Lower Secondary develops knowledge and skills in 10 subjects

- English as a first language
- English as a second language
- Mathematics
- Science
- Global Perspectives
- Computing
- Digital Literacy
- Art & Design
- Music
- Physical Education

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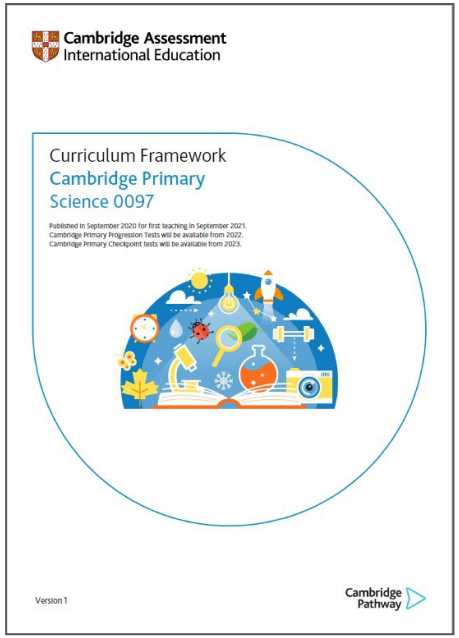
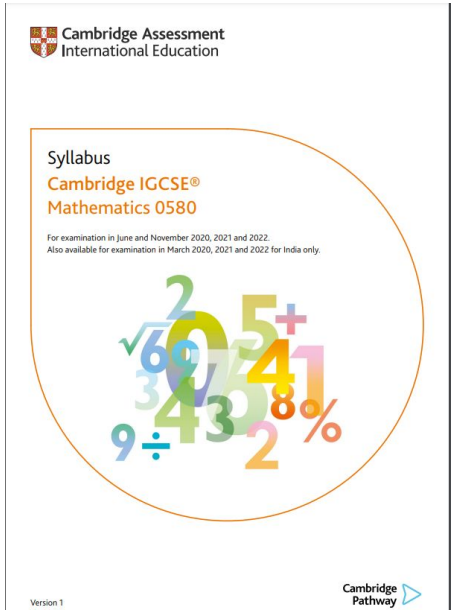
Progression of learning

IGCSE

Primary

Lower Secondary





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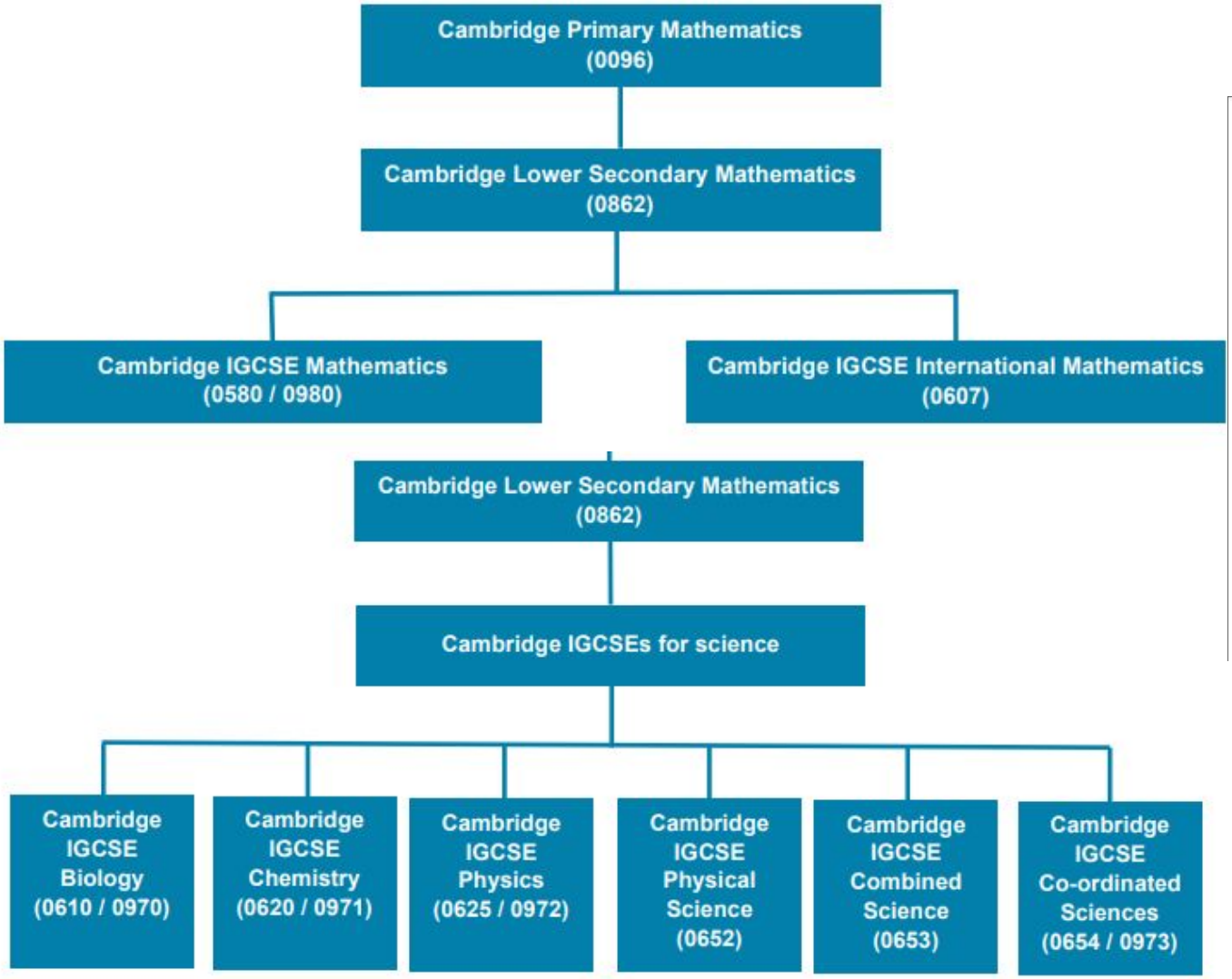
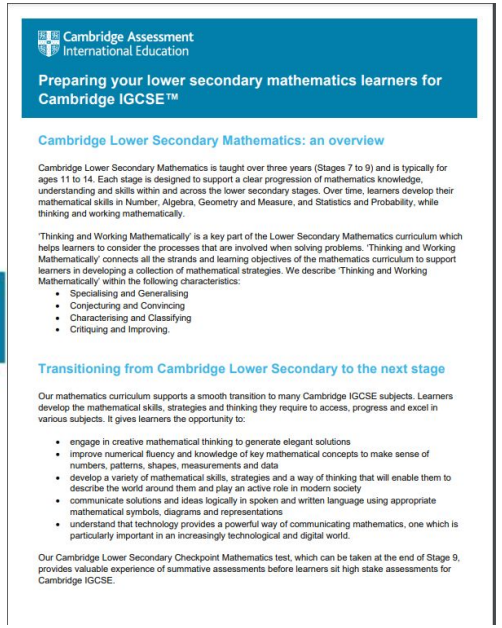
Transition from Lower Secondary to IGCSE

Lower Secondary Mathematics prepares students for IGCSE Mathematics and Science





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Preparing your lower secondary mathematics learners for Cambridge IGCSE™

Cambridge Lower Secondary Mathematics: an overview

Cambridge Lower Secondary Mathematics is taught over three years (Stages 7 to 9) and is typically for ages 11 to 14. Each stage is designed to support a clear progression of mathematics knowledge, understanding and skills within and across the lower secondary stages. Over time, learners develop their mathematical skills in Number, Algebra, Geometry and Measure, and Statistics and Probability, while thinking and working mathematically.

'Thinking and Working Mathematically' is a key part of the Lower Secondary Mathematics curriculum which helps learners to consider the processes that are involved when solving problems. 'Thinking and Working Mathematically' connects all the strands and learning objectives of the mathematics curriculum to support learners in developing a collection of mathematical strategies. We describe 'Thinking and Working Mathematically' within the following characteristics:

- Specialising and Generalising
- Conjecturing and Convincing
- Characterising and Classifying
- Critiquing and Improving.

Transitioning from Cambridge Lower Secondary to the next stage

Our mathematics curriculum supports a smooth transition to many Cambridge IGCSE subjects. Learners develop the mathematical skills, strategies and thinking they require to access, progress and excel in various subjects. It gives learners the opportunity to:

- engage in creative mathematical thinking to generate elegant solutions
- improve numerical fluency and knowledge of key mathematical concepts to make sense of numbers, patterns, shapes, measurements and data
- develop a variety of mathematical skills, strategies and a way of thinking that will enable them to describe the world around them and play an active role in modern society
- communicate solutions and ideas logically in spoken and written language using appropriate mathematical symbols, diagrams and representations
- understand that technology provides a powerful way of communicating mathematics, one which is particularly important in an increasingly technological and digital world.

Our Cambridge Lower Secondary Checkpoint Mathematics test, which can be taken at the end of Stage 9, provides valuable experience of summative assessments before learners sit high stake assessments for Cambridge IGCSE.

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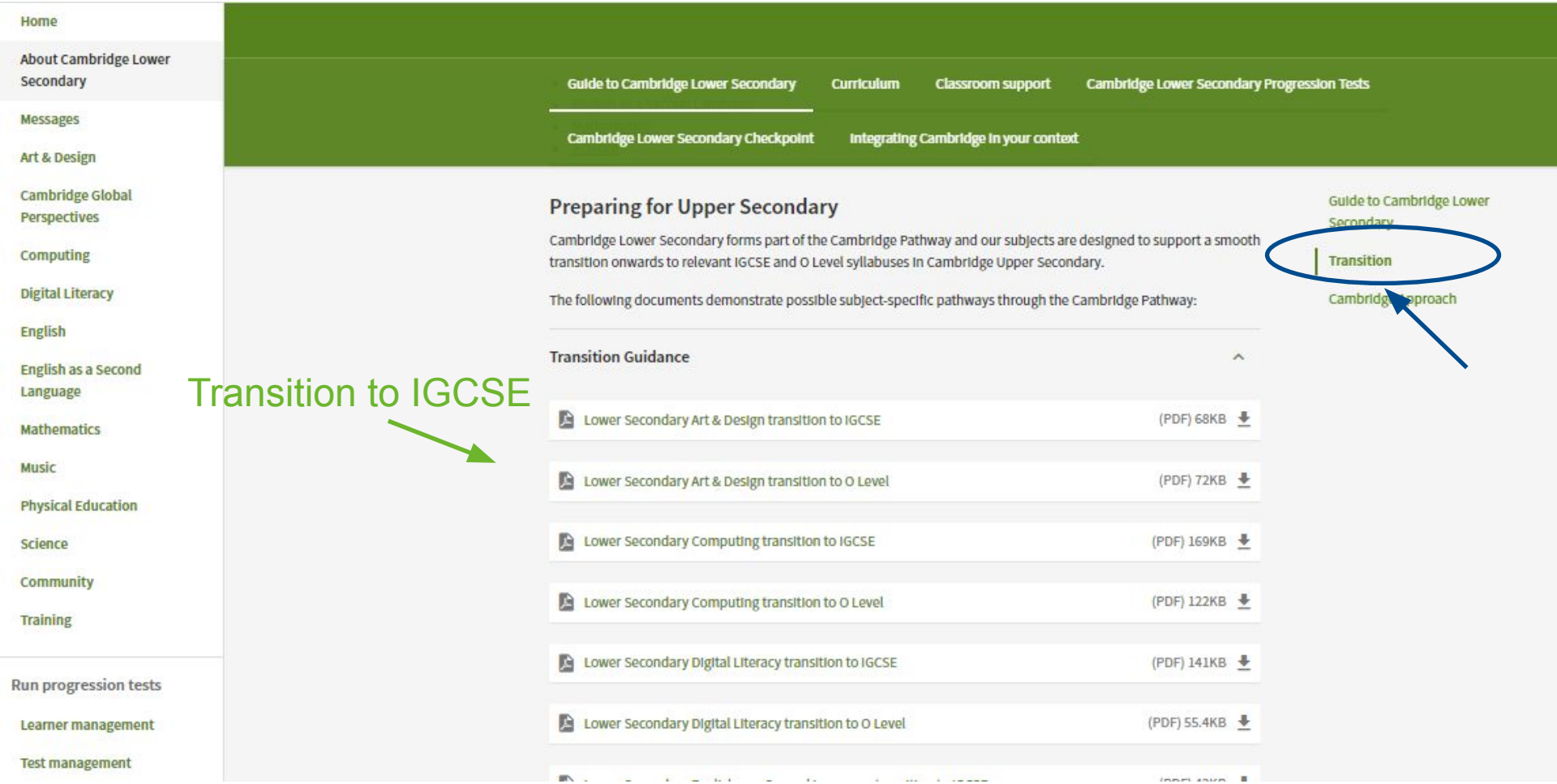
Support Site – Transition to IGCSE



https://lowersecondary.cambridgeinternational.org/about-cambridge-lower-secondary

Assessment Options

Subject	Checkpoint	Progression Tests	Assessment Guidance
English English as a Second Language Mathematics Science	YES	YES	-
Global Perspectives	YES	-	-
Art & Design Computing Digital Literacy Music Physical Education	-	-	YES

Checkpoint: Stages 6 and 9 only

Progression Tests: Stages 3, 4, 5, 6, 7, 8 and 9

Which curriculum should I teach?

Start Teaching	Which Curriculum?	Which Checkpoint?
February 2022	Stage 6 and Stage 9	Current Checkpoint (Oct 2022)
	Current curriculum	(0837, 0844, 0845, 0846)
	Stages 1 to 5, 7 and 8	
	NEW curriculum	
February 2023	**All stages NEW curriculum**	**New Checkpoint (Oct 2023)**
		(0057, 0058, 0096, 0097)
September 2022	**All stages NEW Curriculum**	**New Checkpoint (May 2023)**
		(0057, 0058, 0096, 0097)

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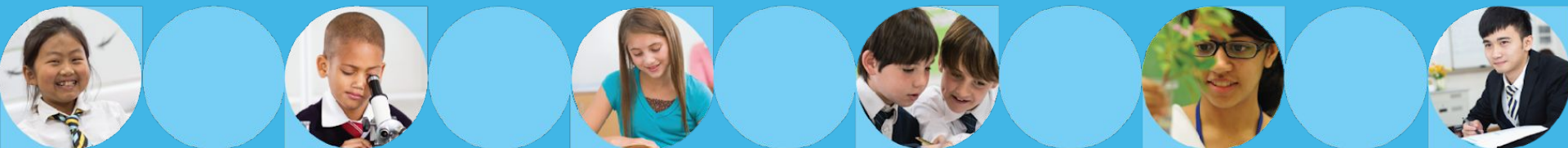
21st century skills:

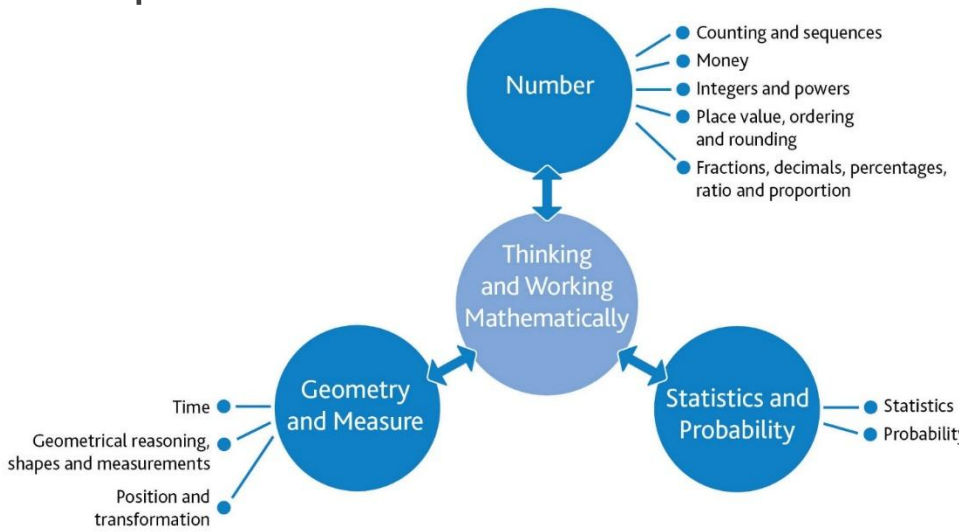
Mathematics, Science, English, Global Perspectives and Computing

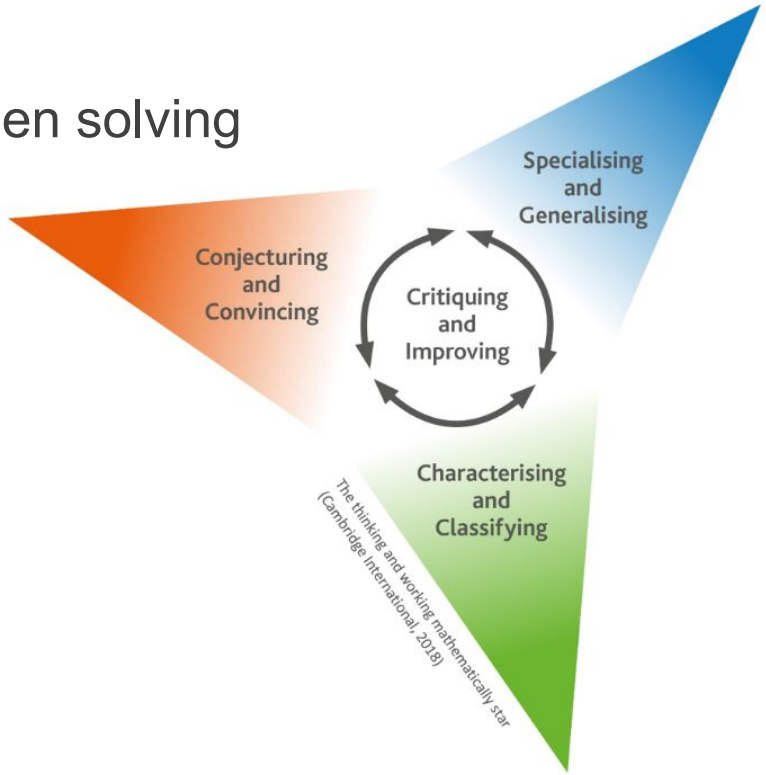


Primary and Lower Secondary Maths

4 Introducing Thinking and Working Mathematically

- 21st century skills
- Helps learners consider processes when solving problems.





[Thinking and Working Mathematically: an exciting new feature of the Cambridge Primary and Lower Secondary Mathematics programme]

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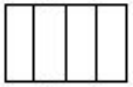
Curriculum Framework – Progression Grid

1Nf.03 Understand that a half can act as an operator (whole number answers).	**2Nf.04** Understand that fractions (half, quarter and three-quarters) can act as operators.	**3Nf.05** Understand that fractions (half, quarter, three-quarters, third and tenth) can act as operators.	**4Nf.03** Understand that unit fractions can act as operators.	**5Nf.02** Understand that proper fractions can act as operators.	**6Nf.02** Understand that proper and improper fractions can act as operators.
In examples start by using the word half and only move to the symbol $\frac{1}{2}$ when learners are secure with the concept. e.g. half of 8 is 4 In this example the fraction $\frac{1}{2}$ (half) is operating on 8. The operator, one half, decreases the original value from 8 to 4. Learners should be able to find half of any even number from 0 to 20 Fractions as operators means "fractions of" or half of. What is one half of six?	Use examples that use diagrams e.g.  Learners find $\frac{1}{4}$ of the above shape   Learners find $\frac{1}{2}$ of the above marbles.  Learners should be able to find quarter and half of numbers from 1 to 20. Do not include examples that result in a mixed or improper fraction. e.g. half of 6 = 3 quarter of 12 = 3	Find halves, thirds, quarters and tenths of numbers. In examples use the fraction notation $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{10}$ e.g. Learners find $\frac{1}{2}$ of this shape  Find $\frac{3}{4}$ of these marbles  Fraction as operator: a unit fraction is understood to be a number that acts on another number in the sense of shrinking the magnitude of the number. e.g. Find $\frac{1}{10}$ of 100. The answer is 10. The operator, $\frac{1}{10}$, decreases the original value from 100 to 10.	e.g. Learners find $\frac{1}{5}$ of this shape   Use $\frac{3}{4}$ as the only non-unit fraction as it was covered in previous stages.	Initially use examples with numbers that are easy to calculate (tenths). Ensure learners understand that operators are multiplicative rather than additive. e.g. $\frac{3}{10}$ of 100m is 30m Ensure learners understand that to solve this example several combinations of operations could occur: - Divide100m by 10 then multiply by 3 or - Multiply 100m by 3 then divide by 10 The answer 30m is less than 100m because 100m was multiplied by a fraction less than 1 Ensure learners understand that they can multiply a quantity that represents a fraction to find the whole quantity e.g. If $\frac{1}{4}$ of a length is 36cm, then the whole length is 36 × 4 = 144cm.	e.g. $\frac{1}{2}$ of 6 is equal to 9.

https://primary.cambridgeinternational.org/maths-0845/maths-0096

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Schemes of Work

Learning objectives	Suggested teaching activities and resources	Mental strategies, possible misconceptions and comments
6Nc.03 Use the relationship between repeated addition of a constant and multiplication to find and use a position-to-term rule. **TWM.01 Specialising** Choosing *an example* and checking to see if it satisfies or does not satisfy specific mathematical criteria **TWM.02 Generalising** Recognising an underlying pattern by identifying many examples that satisfy the same mathematical criteria	Write the equation 3 + 3 + 3 + 3 on the board and ask learners what the total is. Ask learners how else we could solve this equation using multiplication (4 x 3). Establish that the first method uses repeated addition of the constant 3, while the second method is using multiplicative reasoning and that 3 is being multiplied four times. Both generate the same answer of 12. Ask learners: • *If this equation (4 x 3) is the 4th term, what would be the 1st, 2nd and 3rd terms? (1 x 3), (2 x 3), (3 x 3). Do you notice a pattern?* • *Can you predict what the 10th, 20th, 100th term would be? (10 x 3), (20 x 3), (100 x 3).* • *What about the nth term? (n x 3 or 3n)* Ask learners questions about the sequence such as: • *Will one of the numbers in this sequence be 21? How do you know?* • *Will one of the numbers in this sequence be 0? How do you know?* In pairs, ask learners to generate other number sequences, beginning with repeated addition and then linking it to multiplication. With another pair, give them your list of numbers and ask them to find the term rule. Learners will show they are **specialising (TWM.01)** when they create their own number sequences from specific numbers. Learners will show they are **generalising (TWM.02)** when they notice certain properties of the sequence.	**Possible misconceptions:** Learners think that the constant can change value. e.g. for the sequence 1, 3, 6, 10, 15, … the differences are +2, +3, +4, +5, …

Primary and Lower Secondary English

Integrating four skills:

Reading

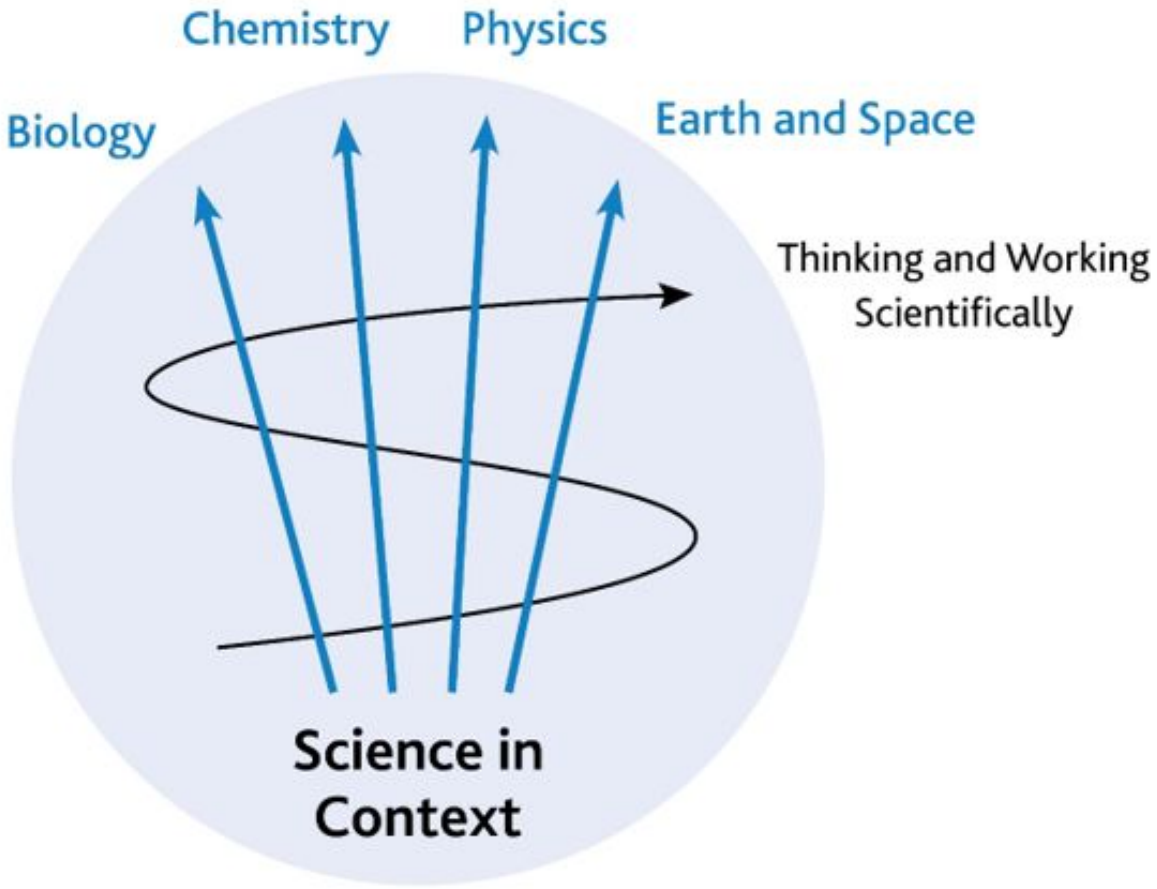
Writing

Speaking and Listening

- Greater emphasis on broad experience of texts

https://primary.cambridgeinternational.org/english-0844/english-0058

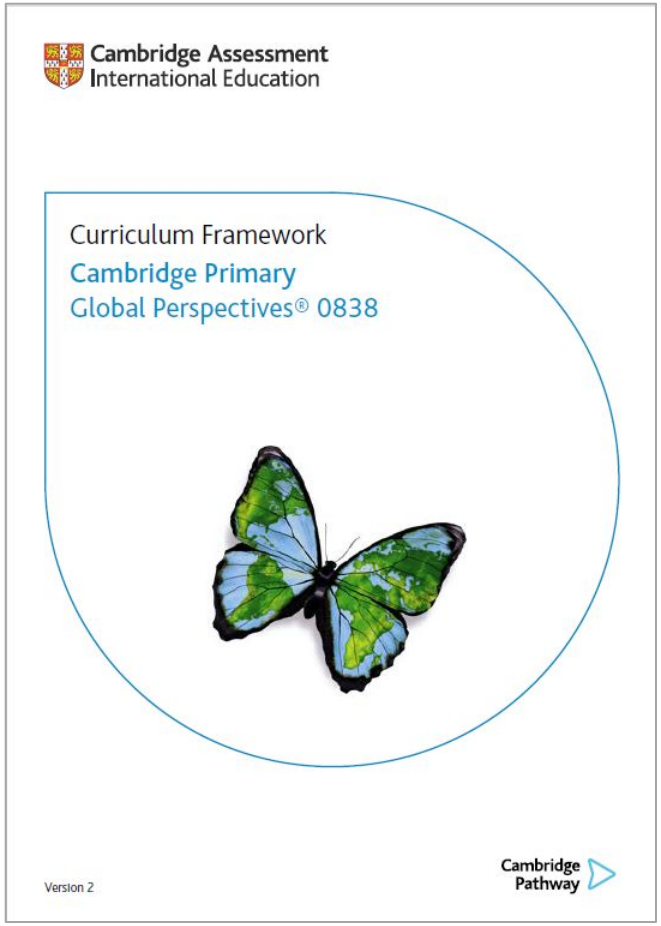
Primary and Lower Secondary Science



https://primary.cambridgeinternational.org/science-0846/science-0097

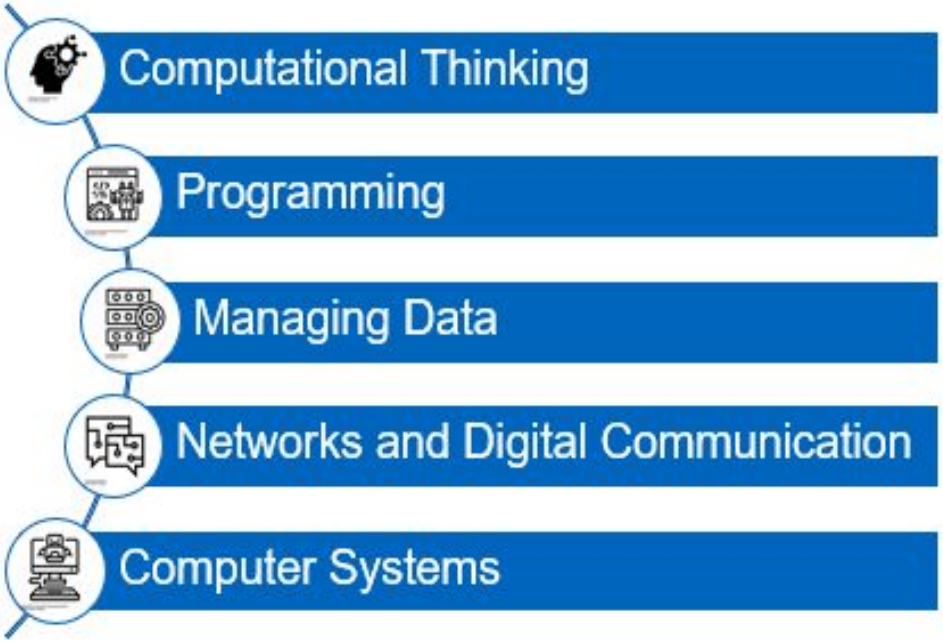
Cambridge Global Perspectives six skills

- Analysis
- Collaboration
- Communication
- Evaluation
- Reflection
- Research



https://primary.cambridgeinternational.org/global-perspectives-0838

Computing September 2021



Industry 4.0

https://primary.cambridgeinternational.org/computing-0059

https://blog.cambridgeinternational.org/programming-for-all-introducing-cambridge-primary-and-lower-secondary-computing/

Digital Literacy or Computing?

4 Both!

Computing

How computers work

Programming
Algorithms and logic
Role of emerging technology, Internet 4.0
Artificial intelligence
WWW security
How data is stored in a computer system

Digital Literacy

How I use computers

Personal safety and wellbeing
Messaging services
Benefits and risks of Artificial Intelligence
WWW URLs, hyperlinks
Input and output devices

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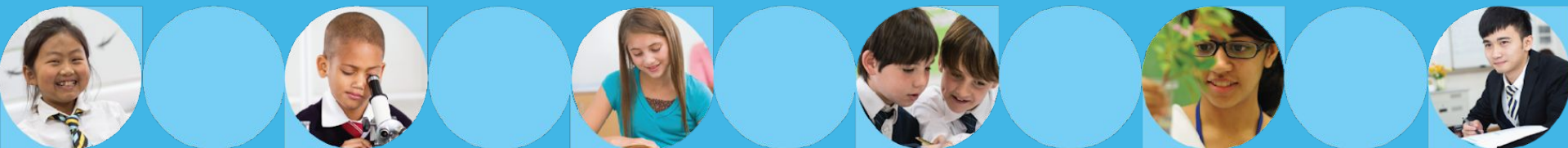
Any questions?



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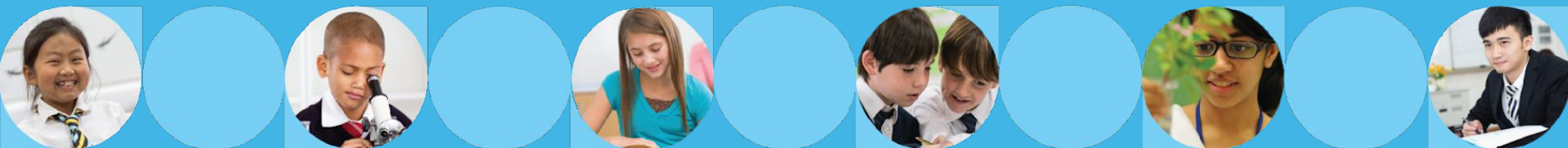
Thank you



Progression to Lower Secondary

BACKWARDS – starts at IGCSE and O Level to reflect the design journey

Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6	Stage 7	Stage 8	Stage 9	IGCSE or O Level
Length	Lines Standard units	Perimeter Area Rectangle	Perimeter Area Rectangle	Perimeter Area Rectangle Compound shapes	Area Rectangle Triangle	Area Rectangle Triangle Compound shapes	Area Rectangle Triangle Parallelogram Trapezium	Area Rectangle Triangle Compound 2D shapes	Carry out calculations involving the perimeter and area of a rectangle, triangle, parallelogram and trapezium and compound shapes derived from these.

[Developing Curriculum Progression - forward, backwards, up, down and across]

Primary and Lower Secondary Support Site

https://primary.cambridgeinternational.org/

https://lowersecondary.cambridgeinternational.org/about-cambridge-lower-secondary

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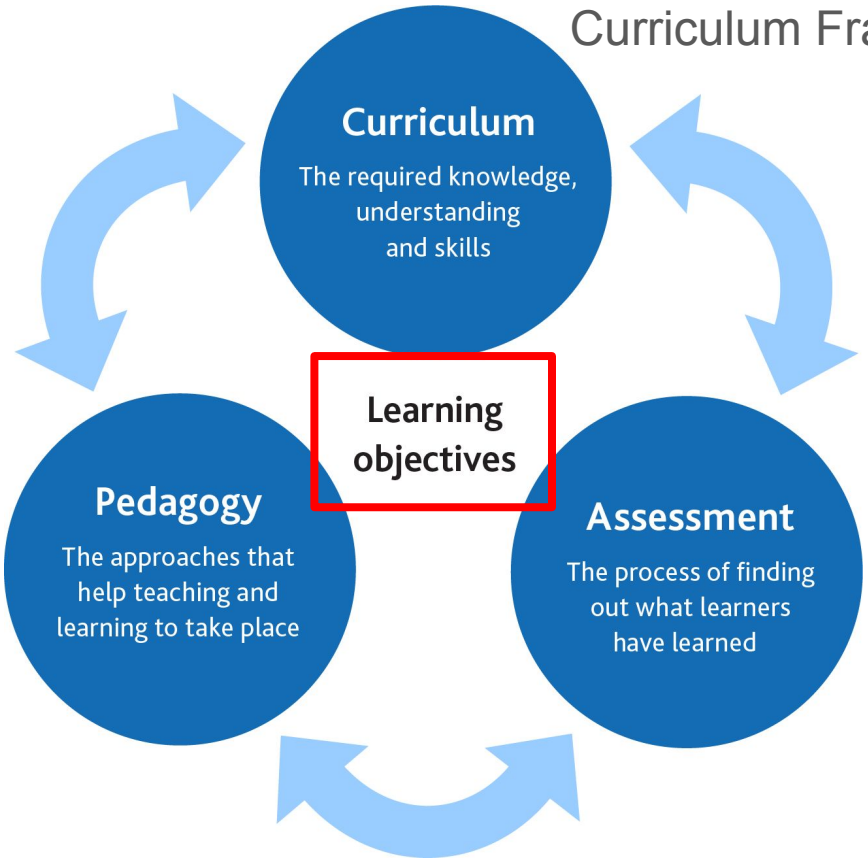
An aligned programme: coherence

Curriculum Framework



Active learning
Teaching Guide
Schemes of Work

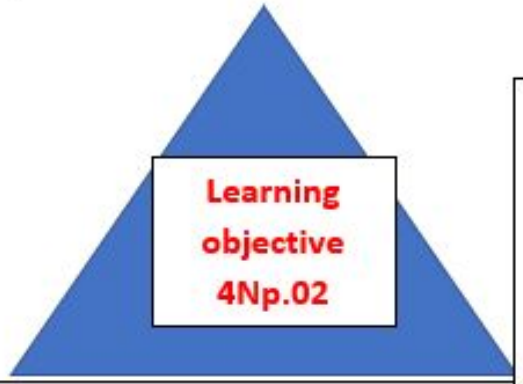
Progression
Tests
Checkpoint

https://blog.cambridgeinternational.org/describing-coherence-of-curriculum-pedagogy-and-assessment/

Curriculum, pedagogy and assessment

Curriculum – taken from Primary Curriculum Framework

4Np.02 Use knowledge of place value to multiply and divide wholes numbers by 10 and100



Assessment – question taken from Stage 4 Progression Test

Complete these calculations:

363 x 10 =

64 000 ÷ 10 =

Pedagogy – activity taken from Stage 4 Scheme of Work

Ask learners:

- *What happens to your numbers if you multiply them by 10?*
- *What happens to your numbers if you multiply them by 100?*

Show learners the number 65 000 and ask them to represent it on a place value grid.

10000s	1000s	100s	10s	1s
6	5	0	0	0
	6	5	0	0

Then ask them to divide it by 10. They should notice that the number is now 10 times smaller. This is the inverse of multiplying 6500 by 10. Explore the effect of multiplying and dividing different numbers by 10 and 100, avoiding answers with decimal numbers.