How do I understand and support my child's development?

Mathematics Parent University - May 2023

Today we will be addressing these questions:

Seated

How do we report on student progress?
What does a continuum look like?
How do parents find curriculum documents?
How do teachers make decisions when assessing students?

Centres of Learning

What does mathematics look like at RCHK?
How can parents help their child develop their interest and abilities in mathematics?

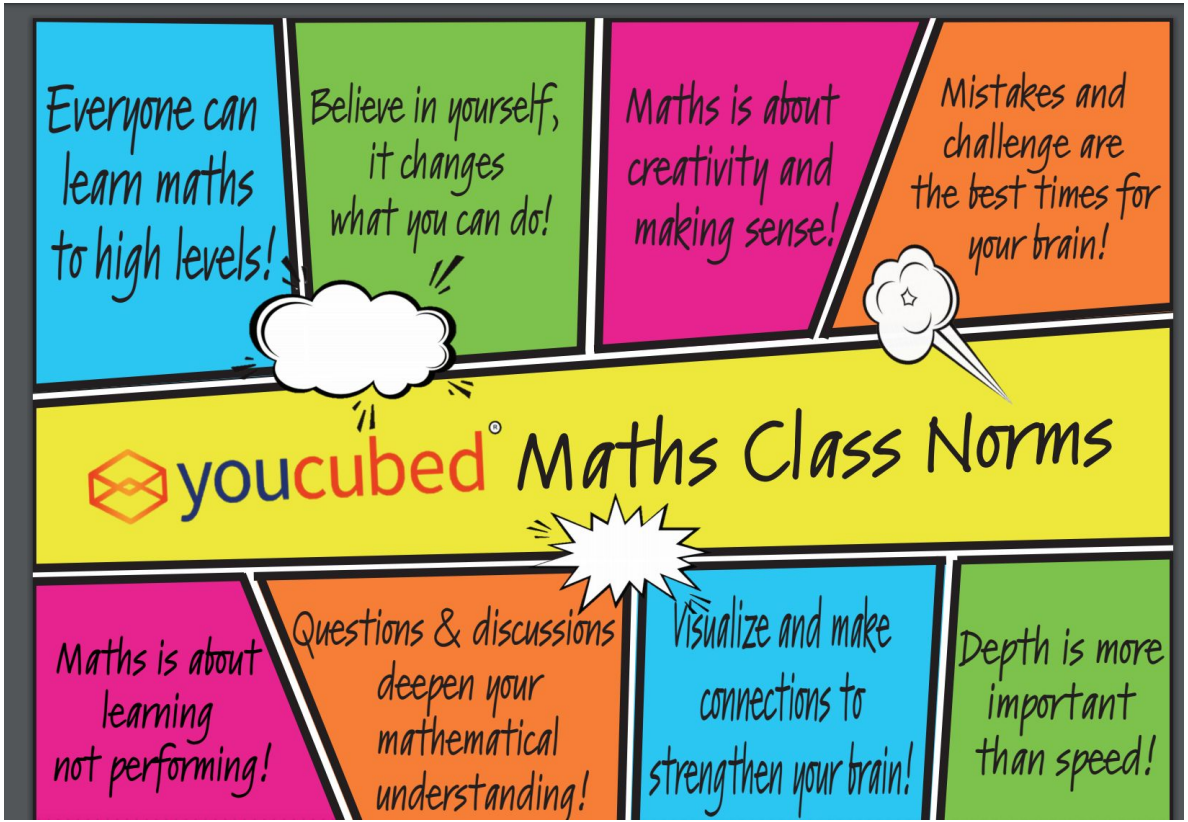
Centres of Learning	Leading Teachers
How do we build early fluency in mathematics? (games, basic facts)	Amy Kun
How do we use the developmental continuum to assess and report on student learning?	Tina Lambert
Maths in the early years and how to support learning at home.	Justine Cordwell
What can mathematical problem-solving and reasoning look like?	Julie Nicolle
What are the Mathematical Thinking skills my child is developing?	Rebecca Price

Mathematics Teaching at RCHK

Inquiry process

- RCHK aims to create an inquiry learning environment where we nurture confident, knowledgeable, resourceful and enthusiastic mathematicians.
- Educators create flexible-learning opportunities for all learners to build curiosity, creativity and confidence through productive challenge.
- Educators will guide and support learners to highlight their progress and growth, and support learners' agency over what and how they engage with their learning.
- Norms such as; positive self-talk, being eraser-free and prioritising depth of learning are explicitly promoted.

What are the norms of our mathematics classes?



"Children don't hate math. What they hate is being confused, intimidated, and embarrassed by math. With understanding comes passion, and with passion comes growth—a treasure is unlocked."

— Larry Martinek

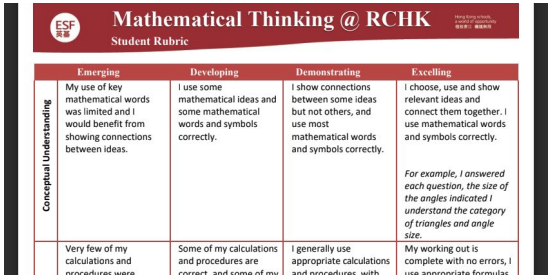
WE ARE TEACHERS

How do we report on student progress?

Mathematics

Effective mathematics learning and teaching is based on students' developing ability to listen to and speak with others, and to understand and use symbols. The importance of expanding these skills by transferring learning and experiences to other contexts allows students to re-encounter their thinking, develop symbolic competency, explore new connections and consolidate their understandings. (IBO, PYP: From Principles into Practice, 2018)

Every child follows their own pathway to learning. The continuum shares developmental milestones for learners. Each milestone falls within an expected age-band. Where a child's current age falls within the range shared, we understand the child to be making developmentally appropriate growth and progress. Strands shared correspond to learning in school; in Mathematics, these strands include number, shape & space, measurement, pattern & function, and data handling. The 'levels of achievement' shared below each age-range are milestones your child has attained, based on teacher assessment.



Mathematical Thinking @ RCHK

Student Rubric

	Emerging	Developing	Demonstrating	Excelling
Conceptual Understanding	My use of key mathematical words was limited and I would benefit from showing connections between ideas.	I use some mathematical ideas and some mathematical words and symbols correctly.	I show connections between some ideas but not others, and use most mathematical words and symbols correctly.	I choose, use and show relevant ideas and connect them together. I use mathematical words and symbols correctly. *For example, I answered each question, the size of the angles indicated I understand the category of triangles and angle size.*
	Very few of my calculations and procedures were	Some of my calculations and procedures are correct, and some of my	I generally use appropriate calculations and procedures, with	My working out is complete with no errors, I use appropriate formulas

Conceptual Understanding – (connecting, representing, identifying, describing, interpreting, sorting, …)

- **Procedural Fluency –** (calculating, recognising, choosing, recalling, manipulating, …)
- **Problem solving** – (applying, designing, planning, checking, imagining, …)
- **Reasoning** – (explaining, justifying, comparing and contrasting, inferring, deducing, proving, …)

Mathematics Continuum

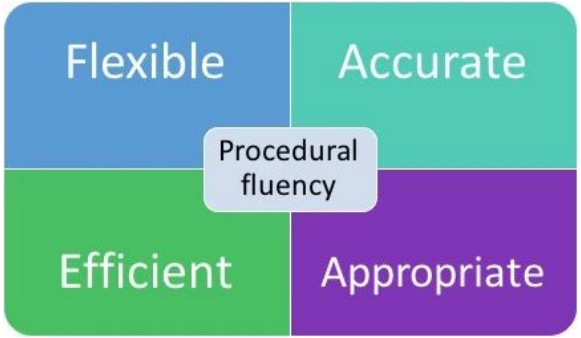
Ages 7-9
Compares and contrasts 2-D and 3-D shapes by their characteristics.
Ages 8-10
Analyses and describes 2D and 3D shapes. Makes simple unit conversions.
Ages 9-11
Models the concept of dimension.

Next Steps in Learning
Defines the spatial features common to all members of a group of plane shapes or prism Uses angle and line properties to classify and describe triangles and quadrilaterals

RCHK Mathematical Thinking Skills

Conceptual Understanding

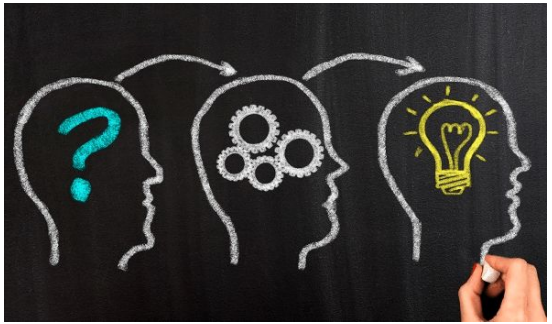
Procedural Fluency



CONTENT

Problem Solving

Reasoning



What is a continuum?

A curriculum continuum shares **developmental milestones** for learners.

These learning **progressions** elaborate on developmentally-appropriate growth and progress and align with our ESF Curriculum.

Grounded in educational and scientific research, they detail learning that is generally expected at anticipated age ranges. The learning continuums recognise the fact that every child follows their own pathway to learning.

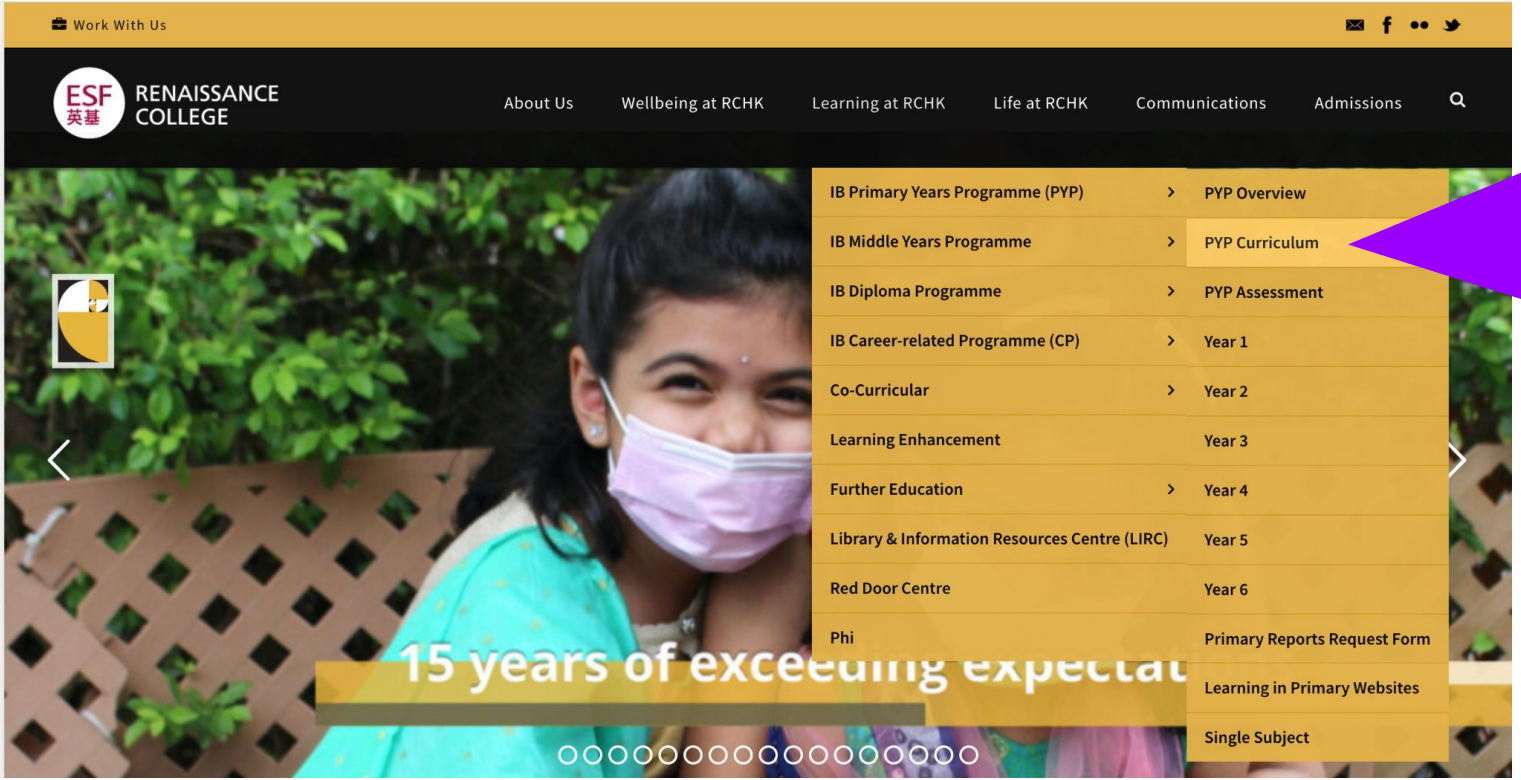
Each milestone falls within an expected age-band. Where a child's current age falls within the range shared, we understand the child to be making developmentally appropriate growth and progress. The 'levels of achievement' shared below each age-range are milestones learners can attain, based on teacher's assessment and monitoring of learning.

What does the RCHK Developmental continuum look like?

Developmental Continuum for Mathematics (Updated: November 14, 2021)

	Ages 3-5 (Phase 1)	Ages 4-6 (Phase 2)	Ages 5-7 (Phase 3)	Ages 6-8 (Phase 4)	Ages 7-9 (Phase 5)	Ages 8-10 (Phase 6)	Ages 9-11 (Phase 7)	Ages 10-13 (Phase 8)	Ages 11-14 (Phase 9)
Number Sense *									
Place Value	• Rote counts to 10 • Counts objects to 10 with one-to-one correspondence	• Rote counts to 31 • Quantifies and compares collections of at least 10 objects • Counts objects to 20 with one-to-one correspondence • Skip counts by tens	• Rote counts to 100 • Counts objects beyond 20 with one-to-one correspondence • Compares and orders numbers to 100 • Groups units into sets of ten • Uses a combination of tens and ones to build 2-digit numbers	• Reads and writes numbers to 100 • Demonstrates understanding of 2-digit place value • Rounds numbers to the nearest 10 • Uses models to represent place value	• Demonstrates understanding of 3-digit place value • Recognises numbers to 1000 • Rounds numbers to the nearest 100 • Explains the role of a zero digit in place value notation	• Recognises and models numbers to 100,000 and .01 • Applies understanding of the base ten relationship between adjacent place value positions • Relates decimals to understanding of place value • Rounds any multi-digit whole number to any place value	• Recognises and models numbers to millions and beyond • Extends base ten to decimals • Reads and writes integers • Identifies key aspects of the relationships between decimal numbers, zero and negative numbers	• Models the distributive property of multiplication to solve 2-digit by 2-digit multiplication	
Four Operations		• Adds using manipulatives • Recognises & names 'how many' in a small group without counting • Explains and models that addition is increasing or additive and subtraction is decreasing or removal	• Skip counts by 2's and 5's • Recognises, interprets and records addition equations • Represents and solves problems using addition and subtraction • Recognizes odd and even numbers • Uses two numbers to total ten • Holds a number constant while counting on	• Recognises and records sums up to 20 • Applies the properties of odd and even numbers when solving problems • Regroups using manipulatives in addition • Knows basic facts for addition and subtraction • Uses repeated addition to multiply • Represents and solves simple addition and subtraction problem using a range of strategies	• Applies basic facts for addition and subtraction • Solves simple addition and subtraction problems using a range of efficient mental and written strategies • Regroups using the addition algorithm • Represent and solve simple multiplication problems using a range of strategies • Decomposes numbers into products of factors and recognise multiples • Regroups using manipulatives in subtraction • Recognises, interprets and records subtraction equations • Divides using manipulatives	• Adds and subtracts large whole numbers • Applies place-value based strategies for solving problems involving multiplication of single-digit by 2-digit numbers • Explains the idea of a remainder and can determine what is left over from the division • Uses divisibility rules to determine if one number is divisible by another	• Adds and subtracts decimals to hundredths • Recalls multiplication tables • Uses a range of mental strategies based on partitioning and combining to solve multiplication problems • Applies estimation and number strategies to solve single and double digit division • Finds fractions, decimals, and percentages of amounts expressed as whole numbers, simple fractions, and decimals	• Works extensively with variables • Computes extensively with decimals, fractions and percents • Computes extensively with integers • Reads and writes exponents and square roots • Connects and converts decimals to fractions (and vice versa) to assist in mental and written computation involving multiplication and division	• Uses strategies to find missing values in a linear relation
Fractions and Ratios		• Represents the concept of ½	• Partitions by sharing fairly • Models the concepts of ½ and ¼	• Relates pictures to symbols of ½, ¼, ⅛, ⅓ • Explains how the more parts into which a whole is divided, the smaller the parts become	• Models the concepts of the whole and simple fractions • Draws linear, area and set models of fractions • Models fraction equivalency • Connects the concepts of fractions and division • Compares and orders fraction quantities using benchmark referents	• Models and names all types of fractions using a range of representations • Compares and orders fraction quantities using appropriate strategies • Converts between all types of fractions • Applies knowledge of fractions to add and subtract unlike denominators • Models and represents multiplication and division of fractions	• Uses and justifies the choice of fraction representation • Categorises types of fractions and simplifies where appropriate • Demonstrates understanding of fraction constructs, including part-whole, measure, division, operator and ratio • Reads and writes ratios	• Applies understanding of relationships within fractions when scaling	

How do Parents find curriculum documents?



Please click here to download a copy of our Programme of Inquiry.

Access our written Curriculum documents for Primary

Note: This is a password-protected website. Please contact your child's class teacher if you do not have the password.

PASSWORD: primaryrchk (lowercase)

PYP Curriculum

- Home
  - Chinese
  - English
  - Mathematics
  - Music
  - Physical Education
  - Science

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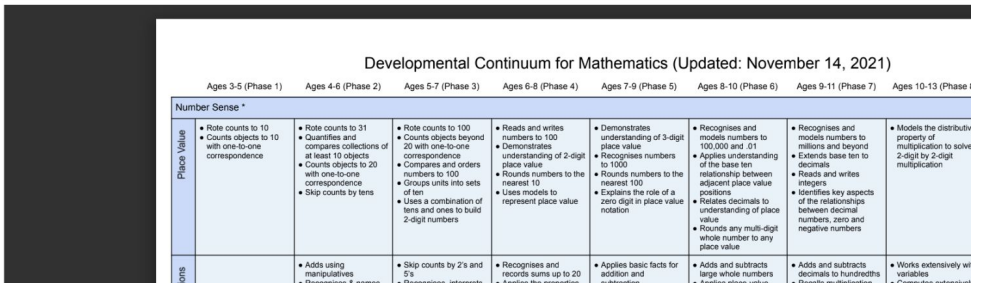

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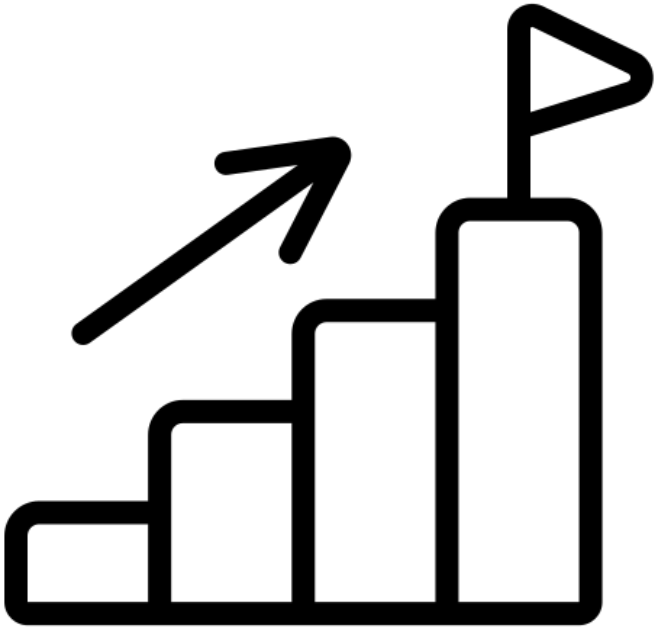
Operations		• Adds using manipulatives	• Skip counts by 2's and 5's	• Recognises and records sums up to 20	• Applies basic facts for addition and	• Adds and subtracts large whole numbers	• Adds and subtracts decimals to hundredths	• Works extensively wi variables

Increments of progress

- Phase 1(Age 3-5) - Compares relative size of objects
- Phase 2 - Estimates and measures using non-standard units
- Phase 3 - Recognizes the difference between standard and non-standard units
- Phase 4 - Measures, compares and estimates using standard units to measure length/mass/volume & capacity
- Phase 5 -Uses tools to find measures, including timelines
- Phase 6 -Makes simple unit conversions
- Phase 7 -Selects and uses appropriate units & tools to measure
- Determines and justifies levels of accuracy needed to solve real-life problems involving measurement
- Phase 8 - Solves problems using decimal and fractional notation in measurement
- Applies conversions of formal units of measurement in problem solving applications



What have you connected with?

What do you still want to know?

www.menti.com

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