

RAFFLES WORLD ACADEMY



RAFFLES

WORLD ACADEMY

MATHEMATICS - Number
RWA SCOPE AND SEQUENCE

RWA Scope and Sequence - Mathematics - Number

MISSION AND CORE VALUES

Raffles World Academy (RWA) was founded in September 2008. It is an independent co-educational private international day school operated by Innoventures Educational Investments LLC (aka Innoventures Education). The school began its history as Raffles International School (West Campus) and changed its name to Raffles World Academy in September 2012. The Academy is authorised to provide IBPYP in KG1-G5, IBMYP curriculum in G6-10 and IB Diploma and Courses to G11-12. It is an IB World School and a centre for Cambridge International Examinations. The school also provides other programmes including College Board PSAT and SAT, Trinity, and Mother Tongue language programmes including CNED and DELF for French. Raffles World Academy is regulated by the Dubai Knowledge and Human Development Authority (KHDA).

Our Guiding Statements

Our Vision

Providing world class education.

Our Mission

To empower students with a rigorous, holistic and international education for success in an ever-changing world.

Our Philosophy

To be recognized by the success of our students in achieving their personal goals

To make student development the centre of all school decisions

To aspire to the highest internationally recognized performance standards

To build and celebrate a culture based on internationalism

To enable the staff to become life-long learners through the development of their professional practice

Our Core Values

Achievement | Collaboration | Integrity | Respect | Responsibility

The RWA Motto

Towards Excellence

The RWA Mascot

Arabian Stallion

The RWA definition of International-Mindedness:

International Mindedness begins when we are open to and curious about the world in which we live, respect our own culture and want to know about the culture of others. We progress to acknowledge our common humanity and to recognize and value diversity existing within our communities, whether local, national or global. We exercise our individual and collective responsibilities as world citizens to safeguard the planet we share, promote peace, challenge injustice and engage in improving welfare for all, especially the disadvantaged. We seek to develop a deep understanding of the complexity, diversity and motives that underpin human actions and interactions. We strive to foster mutual respect, dialogue and cooperation through being open and willing to see the world through the lens of all those who share it with us.

As an IB school, international-mindedness is embodied in our implementation of the IB Learner Profile, which challenges students to be communicators in multiple languages, principled in their promotion of international justice, risk-takers in the spirit of exploring new cultures, knowledgeable about world issues, thinkers about complex problems, caring and committed to service, inquirers about the world, open-minded toward other perspectives, balanced in their approach to life, and reflective about their own personal development.

IB MISSION STATEMENT

IB mission statement The International Baccalaureate aims to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect. To this end the organization works with schools, governments and international organizations to develop challenging programmes of international education and rigorous assessment. These programmes encourage students across the world to become active, compassionate and lifelong learners who understand that other people, with their differences, can also be right.

IB Learner Profile

The aim of all IB programmes is to develop internationally minded people who, recognizing their common humanity and shared guardianship of the planet, help to create a better and more peaceful world.

IB learners strive to be:

Inquirers: They develop their natural curiosity. They acquire the skills necessary to conduct inquiry and research and show independence in learning. They actively enjoy learning and this love of learning will be sustained throughout their lives.

Knowledgeable: They explore concepts, ideas and issues that have local and global significance. In so doing, they acquire in-depth knowledge and develop understanding across a broad and balanced range of disciplines.

Thinkers: They exercise initiative in applying thinking skills critically and creatively to recognize and approach complex problems, and make reasoned, ethical decisions.

Communicators: They understand and express ideas and information confidently and creatively in more than one language and in a variety of modes of communication. They work effectively and willingly in collaboration with others.

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Principled: They act with integrity and honesty, with a strong sense of fairness, justice and respect for the dignity of the individual, groups and communities. They take responsibility for their own actions and the consequences that accompany them.

Open-minded: They understand and appreciate their own cultures and personal histories, and are open to the perspectives, values and traditions of other individuals and communities. They are accustomed to seeking and evaluating a range of points of view, and are willing to grow from the experience.

Caring: They show empathy, compassion and respect towards the needs and feelings of others. They have a personal commitment to service, and act to make a positive difference to the lives of others and to the environment.

Risk-takers: They approach unfamiliar situations and uncertainty with courage and forethought, and have the independence of spirit to explore new roles, ideas and strategies. They are brave and articulate in defending their beliefs.

Balanced: They understand the importance of intellectual, physical and emotional balance to achieve personal well-being for themselves and others.

Reflective: They give thoughtful consideration to their own learning and experience. They are able to assess and understand their strengths and limitations in order to support their learning and personal development.

RWA Scope and Sequence - Mathematics - Number

Phase 1

Overall Expectation Phase 1: Learners will understand that shapes have characteristics that can be described and compared. They will understand and use common language to describe paths, regions and boundaries of their immediate environment.

PYP Conceptual Understanding:

- Numbers are a naming system.
- Numbers can be used in many ways for different purposes in the real world.
- Numbers are connected to each other through a variety of relationships.
- Making connections between our experiences with number can help us to develop number sense.

Learning Outcomes:

P1	P2	P3	P4	P5	P6	P7	P8
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RWA Scope and Sequence - Mathematics - Number

<p>KG1</p>	<ul style="list-style-type: none"> Selects a small number of objects from a group when asked, for example, 'please give me one', 'please give me two'. <ul style="list-style-type: none"> C: I can identify that objects have an amount (point to all of the balls, etc.) T: I can Selects a small number of objects from a group when asked, for example, 'please give me one', 'please give me two'. A: I can play games that involves taking and giving amounts of objects Recites some number names in sequence. <ul style="list-style-type: none"> C: I am starting to identify numbers in order (0,1,3,4,5) T: I can recites some number names in sequence. A: I can count up with my teacher (visuals may be needed) Creates and experiments with symbols and marks representing ideas of number. <ul style="list-style-type: none"> C: I can make marks and explain their meaning T: I can create and experiment with symbols and marks representing ideas of number. A: I can begin to make marks to represent amounts of objects in my environment Knows that a group of things changes in quantity when something is added or taken away. <ul style="list-style-type: none"> C: I can identify that objects have an amount (point to all of the balls, etc.) T: I know that a group of things changes in quantity when something is added or taken away. A: I can tell if an amount is more or less when an object is taken or added Begins to make comparisons between quantities. <ul style="list-style-type: none"> I can use some language of quantities, (more, less, same, a lot) T: I can begin to make comparisons between quantities. 	<ul style="list-style-type: none"> Uses some number names and number language spontaneously. <ul style="list-style-type: none"> C: I am starting to recognize and use numbers T: I can use some number names and number language spontaneously. A: I can join into songs and games with numbers Uses some number names accurately in play. <ul style="list-style-type: none"> C: I am starting to recognize and use numbers T: I can use some number names accurately in play. A: I can use numbers during structured play and free play Recites numbers in order to 10. <ul style="list-style-type: none"> C: I can count numbers when I can see them T: I can recites numbers in order to 10. A: I can join into counting songs and games in groups Knows that numbers identify how many objects are in a set. <ul style="list-style-type: none"> C: I can identify that objects have an amount (point to all of the balls, etc.) T: I knows that numbers identify how many objects are in a set. T: I can count the amount of an object with the teachers help Beginning to represent numbers using fingers, marks on paper or pictures. <ul style="list-style-type: none"> C: I can identify numbers when I see them - visual or symbol T: I can begin to represent numbers using fingers, marks on paper or pictures. A: I can represent the amount of objects in my environment with my teachers help Sometimes matches numeral and quantity correctly. <ul style="list-style-type: none"> C: I can count the amount of objects with my teachers help T: I can sometimes matches numeral and quantity correctly. 	<ul style="list-style-type: none"> Shows curiosity about numbers by offering comments or asking questions. Compares two groups of objects, saying when they have the same number. <ul style="list-style-type: none"> C: I can identify objects that have the same amount T: I can compare two groups of objects, saying when they have the same number. A: I can find objects of the same amount in my environment Shows an interest in number problems. Separates a group of three or four objects in different ways, beginning to recognise that the total is still the same. <ul style="list-style-type: none"> C: I can count the amount of objects in a group T: I can separates a group of three or four objects in different ways, beginning to recognise that the total is still the same. A: I can separate objects into numbered groups when the amounts are told to me (make two groups, make a group with three in it, etc.) Shows an interest in numerals in the environment. Shows an interest in representing numbers. Realises not only objects, but anything can be counted, including steps, claps or jumps. <ul style="list-style-type: none"> C: I can count objects that are given to me T: I realise not only objects, but anything can be counted, including steps, claps or jumps. A: I can join in to songs and games that involve counting movements 	<ul style="list-style-type: none"> Recognise some numerals of personal significance. <ul style="list-style-type: none"> C: I can model numbers with manipulatives, objects and pictures T: I can recognise some numerals of personal significance. A: I can answer questions about myself that involve number (age, birthday date, classmates, etc.) Recognises numerals 1 to 5. Counts up to three or four objects by saying one number name for each item. <ul style="list-style-type: none"> C: I can model numbers with manipulatives, objects and pictures T: I can recognises numerals 1 to 5. Counts up to three or four objects by saying one number name for each item. A: I can solve real-life problems involving number 1-5 Counts actions or objects which cannot be moved. <ul style="list-style-type: none"> C: I can connect numbers (symbols) to objects T: I can counts actions or objects which cannot be moved. A: I can count objects in my environment Counts objects to 10, and beginning to count beyond 10. Counts out up to six objects from a larger group. <ul style="list-style-type: none"> C: I can connect numbers (symbol) to objects T: I can counts objects to 10, and beginning to count beyond 10. Counts out up to six objects from a larger group. A: I can count objects in my environment up to ten and beyond ten with teachers help Selects the correct numeral to represent 1 to 5, then 1 to 10 objects. <ul style="list-style-type: none"> C: I can count 1 to 10 T: I can select the correct numeral to represent 1 to 5, then 1 to 10 objects. A: I can count objects in the environment Counts an irregular arrangement of up to ten 	<ul style="list-style-type: none"> Estimates how many objects they can see and checks by counting them. <ul style="list-style-type: none"> C: I can model that estimating is taking a guess T: I can estimate how many objects I can see and check by counting them. A: I can count the amount of objects in my environment which are not placed out for me Uses the language of 'more' and 'fewer' to compare two sets of objects. <ul style="list-style-type: none"> C: I can use the vocabulary more and less accurately T: I can use the language of 'more' and 'fewer' to compare two sets of objects. A: I can compare two sets of objects in my environment Finds the total number of items in two groups by counting all of them. <ul style="list-style-type: none"> C: I can model how to combine two groups of objects for counting T: I can find the total number of items in two groups by counting all of them. A: I can solve real-life problems using objects in my environment Says the number that is one more than a given number. <ul style="list-style-type: none"> C: I can model one more using manipulatives, place value blocks T: I can say the number that is one more than a given number. number using number lines if needed A: I can solve rea-life problems involving one more Finds one more or one less from a group of up to five objects, then ten objects. <ul style="list-style-type: none"> C: I can model one more/ one less using manipulatives, place value blocks T: I can find one more or one less from a group of up to five objects, then ten objects. A: I can solve rea-life 	<ul style="list-style-type: none"> Children count reliably with numbers from one to 20, place them in order <ul style="list-style-type: none"> C: I can represent numbers using manipulatives and place value blocks T: I can count independently using number squares when needed A: I can order and sort numbers when put in the wrong order say which number is one more or one less than a given number <ul style="list-style-type: none"> C: I can model one more/ one less using manipulatives, place value blocks T: I can say which number is one more or one less than a given number using number lines if needed A: I can solve rea-life problems involving one more/one less 	<ul style="list-style-type: none"> Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer <ul style="list-style-type: none"> C: I can model addition and subtraction using manipulatives T: I can add and subtract values given using manipulatives independently writing answers A: I can solve addition and subtraction problems with support from the teacher 	<ul style="list-style-type: none"> They solve problems, including doubling, halving and sharing <ul style="list-style-type: none"> C: I can model doubling, halving and sharing using manipulatives T: I can halve, double and share values of numbers without manipulates A: I can solve problems, including doubling, halving and sharing
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RWA Scope and Sequence - Mathematics - Number

- *To conserve, in mathematical terms, means the amount stays the same regardless of the arrangement. Learners who have been encouraged to select their own apparatus and methods, and who become accustomed to discussing and questioning their work, will have confidence in looking for alternative approaches when an initial attempt is unsuccessful. Estimation is a skill that will develop with experience and will help children gain a “feel” for numbers. Children must be given the opportunity to check their estimates so that they are able to further refine and improve their estimation skills. There are many opportunities in the units of inquiry and during the school day for students to practice and apply number concepts authentically

Phase 2

Overall Expectation Phase 2: Learners will continue to work with 2D and 3D shapes, developing the understanding that shapes are classified and named according to their properties. They will understand that examples of symmetry and transformations can be found in their immediate environment. Learners will interpret, create and use simple directions and specific vocabulary to describe paths, regions, positions and boundaries of their immediate environment.

PYP Conceptual Understandings:

- The base 10 place value system is used to represent numbers and number relationships.
- Fractions are ways of representing whole- part relationships.
- The operations of addition, subtraction, multiplication and division are related to each other and are used to process information to solve problems.
- Number operations can be modelled in a variety of ways.
- There are many mental methods that can be applied for exact and approximate computations.

Learning Outcomes:

Number

RWA Scope and Sequence - Mathematics - Number

KG2

Number: Place Value

- **Count to ten, forwards and backwards, beginning with 0 or 1, or from any given number.**
- *C: I can model how numbers grow by one/reduce by one when counting using manipulatives, number squares and number lines*
- *T: I can count to ten, forwards and backwards, beginning with 0 or 1, or from any given number.*
- *A: I can solve real-life problems and word/number puzzles involving counting*

- **Count in multiples of twos.**
- *C: I can model multiples of two using manipulatives, number lines and number squares*
- *T: I can count in multiples of twos.*
- *A: I can solve real-life problems involving multiples*

- **Count, read and write numbers to 10 in numerals and words.**
- *C: I can use vocabulary connected to place value*
- *T: I can read and write numbers to at least 10 in numerals and words.*
- *A: I can read and write number sentences*

- **Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least.**
- *C: I can model ones and tens - including how ones become tens - using manipulatives and place value blocks*
- *T: I can identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least.*
- *A: I can solve real-life problems and word/number puzzles involving place value using correct vocabulary*

- **Given a number, identify one more or one less.**
- *C: I can model one more/one less using manipulatives, number lines, number squares and place value blocks*
- *T: I can, given a number, identify one more or one less.*
- *A: I can solve real-life problems and word/number puzzles involving one more/one less*

- **Count to twenty, forwards and backwards, beginning with 0 or 1, from any given number.**
- *C: I can model how numbers grow by one/reduce by one when counting using manipulatives, number squares and number lines*
- *T: I can count to ten, forwards and backwards, beginning with 0 or 1, or from any given number.*
- *A: I can solve real-life problems and word/number puzzles involving counting*

- **Count, read and write numbers from 1 to 20 in numerals and words.**
- *C: I can use vocabulary connected to place value*
- *T: I can read and write numbers to at least 20 in numerals and words.*
- *A: I can read and write number sentences*

- **Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least.**
- *C: I can model vocabulary attached to quantity using number lines, number squares, manipulatives and place value blocks*
- *T: I can identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least.*
- *A: I can solve real-life problems and word/number puzzles involving counting*

- **Count in multiples of twos and fives**
- *C: I can model multiples of two and fives using manipulatives, number lines and number squares*
- *T: I can count in multiples of twos and fives.*
- *A: I can solve real-life problems involving multiples*

- **Count to 40 forwards and backwards, beginning with 0 or 1, or from any number.**
- *C: I can model how numbers grow by one/reduce by one when counting using manipulatives, number squares and number lines*
- *T: I can count to ten, forwards and backwards, beginning with 0 or 1, or from any given number.*
- *A: I can solve real-life problems and word/number puzzles involving counting*

- **Count, read and write numbers from 1 - 40 in numerals and words.**
- *C: I can use vocabulary connected to place value*
- *T: I can read and write numbers to at least 40 in numerals and words.*
- *A: I can read and write number sentences*

- **Identify and represent numbers using objects and pictorial drawings.**
- *C: I can model numbers using manipulatives, place value blocks and pictures*
- *T: I can identify and represent numbers using objects and pictorial drawings.*
- *A: I can solve real-life problems and word/number puzzles involving counting*

- **Given a number, identify 1 more or 1 less**

RWA Scope and Sequence - Mathematics - Number

Number

RWA Scope and Sequence - Mathematics - Number

Grade 1

Number - Place Value

- Count in steps of 2, 3 and 5 from 0 and in tens from any number, forward and backward.
 - C: I can model skip counting using manipulatives, number lines and number squares
 - T: I can count in steps of 2, 3 and 5 from 0 and in tens from any number, forward and backward.
 - A: I can solve real-life problems using skip counting
- Recognize the place value of each digit in a two digit number (tens, ones)
 - C: I can model value of digits using place value blocks, manipulatives, place value flip charts (ones, ten, hundreds)
 - T: I can recognize the place value of each digit in a two digit number (tens, ones)
 - A: I can solve real-life problems and word/number puzzles involving place value
- Identify, represent and estimate numbers to 100 using different representations including the number line.
 - C: I can identify numbers represented by place value blocks and manipulatives
 - T: I can identify, represent and estimate numbers to 100 using different representations including the number line.
 - A: I can solve number sequences, patterns and word/number puzzles involving place value
- Compare and order numbers from 0 up to 100; use $<$, $>$ and $=$ signs.
 - C: I can compare and order numbers using visual representations of numbers
 - T: I can compare and order numbers from 0 up to 100; use $<$, $>$ and $=$ signs.
 - A: I can solve real-life problems and word/number puzzles involving place value
- Read and write numbers to at least 100 in numerals and words.
 - C: I can use vocabulary connected to place value
 - T: I can read and write numbers to at least 100 in numerals and words.
 - A: I can read and write number sentences
- Use place value and number facts to solve problems
 - C: I can select and use an appropriate sequence of operations and tools (number lines, number squares, manipulatives) to solve problems
 - T: I can visually model my thinking when solving multistep problems
 - A: I can use place value and number facts to solve problems

Number - Addition and Subtraction

- Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100.
 - C: I can model addition and subtraction using manipulatives, pictures and number bonds
 - T: I can recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100.
 - A: I can solve real-life problems and word/number puzzles involving addition and subtraction
- Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two digit number and ones; a two digit number and tens; two two digit numbers; adding three one digit numbers
 - C: I can model mental strategies for addition and subtraction for others
 - T: I can add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two digit number and ones; a two digit number and tens; two two digit numbers; adding three one digit numbers
 - A: I can solve real-life problems involving addition and subtraction
- Show that the addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot.
 - C: I can model fact families using manipulatives and pictorials (addition and subtraction)
 - T: I can show that the addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot.
 - A: I can solve real-life problems and word/number puzzles involving addition and subtraction
- Recognize and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.
 - C: I can model how inverse relationships (subtraction and addition) to check answers
 - T: I can recognize and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.
 - A: I can solve real-life problems and word/number puzzles involving addition and subtraction and check answers
- Solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures; applying their increasing knowledge of mental and written methods.
 - C: I can select and use an appropriate sequence of operations and tools (number lines, number squares, manipulatives) to solve problems
 - T: I can visually model my thinking when solving multistep problems
 - A: I can solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures; applying their increasing knowledge of mental and written methods.

Number - Multiplication and Division

- Recall and use multiplication and division facts for the 2, 5 and 10 times tables, including recognizing odd and even numbers.
 - C: I can model multiplication and division using manipulatives, arrays and continuous addition/subtraction
 - T: I can recall and use multiplication and division facts for the 2, 5 and 10 times tables, including recognizing odd and even numbers.
 - A: I can solve real-life problems involving multiplication and division

Phase 3

Overall Expectation Phase 3: Learners will sort, describe and model regular and irregular polygons, developing an understanding of their properties. They will be able to describe and model congruency and similarity in 2D shapes. Learners will continue to develop their understanding of symmetry, in particular reflective and rotational symmetry. They will understand how geometric shapes and associated vocabulary are useful for representing and describing objects and events in real-world situations.

PYP Conceptual Understandings:

- The base 10 place value system can be extended to represent magnitude.
- Fractions and decimals are ways of representing whole-part relationships.
- The operations of addition, subtraction, multiplication and division are related to each other and are used to process information to solve problems.
- Even complex operations can be modelled in a variety of ways, for example, an algorithm is a way to represent an operation.

Learning Outcomes

Number

RWA Scope and Sequence - Mathematics - Number

Grade 2

Number - Place Value

- **Read and write numbers up to 1000 in numerals and in words.**
- *C: I can model numbers to thousands or beyond using the base 10 place value system (Place value blocks, manipulatives, place value flip charts)*
- *T: I can read and write numbers up to 1000 in numerals and in words.*
- *A: I can solve number sequences, patterns and word/number puzzles involving place value*

- **Compare and order numbers up to 1000**
- *C: I can compare and order numbers using place value blocks and manipulatives*
- *T: I can compare and order numbers up to 1000*
- *A: I can solve real-life problems that involve place value*

- **Identify, represent and estimate numbers using different representations.**
- *C: I can identify numbers represented by place value blocks and manipulatives*
- *T: I can identify, represent and estimate numbers using different representations.*
- *A: I can solve real-life problems and word/number puzzles involving place value*

- **Find 10 or 100 more or less than a given number; recognize the place value of each digit in a three digit number (hundreds, tens, and ones).**
- *C: I can model 10 or 100 more or less of a given number using place value blocks and manipulatives*
- *T: I can find 10 or 100 more or less than a given number; recognize the place value of each digit in a three digit number (hundreds, tens, and ones).*
- *A: I can solve number sequences, patterns and word/number puzzles involving place value*

- **Count from 0 in multiples of 50 and 100**
- *C: I can model multiples using number lines, number squares and diagrams*
- *T: I can count from 0 in multiples of 50 and 100*
- *A: I can solve number sequences, patterns and word/number puzzles involving multiples*

- **Solve number problems and practical problems involving these ideas.**
- *C: I can select and use an appropriate sequence of operations and tools (number lines, number squares, manipulatives) to solve problems*
- *T: I can visually model my thinking when solving multistep problems*
- *A: I can solve number problems and practical problems involving place value*

Number - Addition and Subtraction

- **Add and subtract numbers mentally, including: a three digit number and ones; a three-digit number and tens; a three digit number and hundreds.**
- *C: I can visually model mental strategies for addition and subtraction for others*
- *T: I can add and subtract numbers mentally, including: a three digit number and ones; a three-digit number and tens; a three digit number and hundreds.*
- *A: I can solve real-life problems and word/number puzzles using mental addition and subtraction strategies*

- **Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction.**
- *C: I can model addition and subtraction using place value using place value blocks and manipulatives*
- *T: I can add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction.*
- *A: I can answer real-life problems involving addition and subtraction*

- **Estimate the answer to a calculation and use inverse operations to check answers.**
- *C: I can model how inverse operations can be used to check answers (addition and subtraction)*
- *T: Estimate the answer to a calculation and use inverse operations to check answers.*
- *A: I can use estimation to help solve real-life problems involving addition and subtraction*

- **Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.**
- *C: I can select and use an appropriate sequence of operations and tools (number lines, number squares, manipulatives) to solve problems*
- *T: I can visually model my thinking when solving multistep problems*
- *A: I can solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.*

- **Add and subtract amounts of money to give change, using both £ and p in practical contexts.**
- *C: I can use money to model addition and subtraction of money*
- *T: I can add and subtract amounts of money to give change, using both £ and p in practical contexts.*
- *A: I can solve real-life problems involving adding and subtracting money*

Number - Multiplication and Division

- **Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.**
- *C: I can model multiplication and division facts using manipulatives, place value blocks, arrays and continued addition/subtraction*
- *T: I can recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.*
- *A: I can solve real-life problems involving multiplication and division*

RWA Scope and Sequence - Mathematics - Number

Number

RWA Scope and Sequence - Mathematics - Number

Grade 3

Number - Place Value

- **Count in multiples of 6, 7, and 9. 25 and 1000.**
 - *C: I can visually model multiples using manipulatives, diagrams, number squares, etc.*
 - *T: I can count in multiples of 6, 7, and 9. 25 and 1000.*
 - *A: I can solve real-life problems and number sequences and patterns using multiples*
- **Find 1000 more or less than given number.**
 - *C: I can visually model what happens when adding and subtracting 1000 using manipulatives, diagrams, number squares, etc.*
 - *A: I can Find 1000 more or less than given number.*
 - *A: I can solve real-life problems and number sequences and patterns involving adding and subtracting 1000*
- **Count backwards through zero to include negative numbers.**
 - *C: I can visually model negative numbers using number squares, number lines, number squares, etc.*
 - *T: I can count backwards through zero to include negative numbers.*
 - *A: I can solve real-life problems that involve counting forwards and backwards - including negative numbers*
- **Recognize the place value of each digit in a four digit number (thousands, hundreds, tens and ones)**
 - *C: I can model numbers to thousands or beyond using the base 10 place value system*
 - *T: I can recognize the place value of each digit in a four digit number (thousands, hundreds, tens and ones)*
 - *A: I can solve number sequences, patterns and word/number puzzles involving place value up to 4 digits*
- **Order and compare numbers beyond 1000.**
 - *C: I can model numbers to thousands or beyond using the base 10 place value system*
 - *T: I can order and compare numbers beyond 1000.*
 - *A: I can solve number sequences, patterns and word/number puzzles involving place value beyond 1000*
- **Identify, represent and estimate numbers using different representations.**
 - *C: I can model numbers to thousands or beyond using the base 10 place value system*
 - *T: I can identify, represent and estimate numbers using different representations.*
 - *A: I can solve number sequences, patterns and word/number puzzles involving place value beyond 1000*
- **Round any number to the nearest 10, 100 or 1000.**
 - *C: I can model how to round numbers to the nearest 10, 100 or 1000*
 - *T: I can Round any number to the nearest 10, 100 or 1000.*
 - *A: I can solve number sequences, patterns and word/number puzzles involving rounding*
- **Solve number and practical problems that involve all of the above and with increasingly large positive numbers.**
 - *C: I can select and use an appropriate sequence of operations and tools (number lines, number squares, manipulatives) to solve problems*
 - *T: I can visually model my thinking when solving multistep problems*
 - *A: I can solve number and practical problems that involve all of the above and with increasingly large positive numbers.*
- **Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.**
 - *C: I can visually show the values of Roman Numerals up to 100*
 - *T: I can read Roman Numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.*
 - *A: I can solve number sequences, patterns and word/number puzzles involving Roman Numerals*

Number - Addition and Subtraction

- **Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.**
 - *C: I can model addition and subtraction using different methods*
 - *T: I can Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.*
 - *A: I can solve number sequences, patterns and word/number puzzles involving addition and subtraction*
- **Estimate and use inverse operations to check answers to calculation.**
 - *C: I can model how to use inverse operations (addition and subtraction) to check answers*
 - *T: I can estimate and use inverse operations to check answers to calculation.*
 - *A: I can solve real-life problems involving addition and subtraction*
- **Solve addition and subtraction two step problems in contexts, deciding which operations and methods to use and why.**
 - *C: I can select and use an appropriate sequence of operations and tools (number lines, number squares, manipulatives) to solve problems*
 - *T: I can visually model my thinking when solving multistep problems*
 - *A: I can solve addition and subtraction two step problems in contexts, deciding which operations and methods to use and why*

Phase 4

Overall Expectation Phase 4: Learners will understand the properties of regular and irregular polyhedra. They will understand the properties of 2D shapes and understand that 2D representations of 3D objects can be used to visualize and solve problems in the real world, for example, through the use of drawing and modelling. Learners will develop their understanding of the use of scale (ratio) to enlarge and reduce shapes. They will apply the language and notation of bearing to describe direction and position.

PYP Conceptual Understandings:

- The base 10 place value system extends infinitely in two directions.
- Fractions, decimals, and percentages are ways of representing whole-part relationships.
- For fractional and decimal computation, the ideas developed for whole-number computation can apply.
- Ratios are a comparison of two numbers or quantities.

Learning Outcomes:

RWA Scope and Sequence - Mathematics - Number

Grade 4

Number - Place Value

- **Read, write, order and compare numbers to at least 1000000 and determine the value of each digit.**
- *C: I can model the base ten place value system using different resources (place value flip chart, number blocks, manipulatives, etc.)*
- *T: I can read, write, order and compare numbers to at least 1000000 and determine the value of each digit.*
- *A: I can use whole numbers up to millions or beyond in real-life situations*

- **Count forwards or backwards in steps of powers of 10 for any given number up to 1000000.**
- *C: I can model the base ten place value system using different resources (place value flip chart, number blocks, manipulatives, etc.)*
- *T: I can count forwards or backwards in steps of powers of 10 for any given number up to 1000000.*
- *A: I can solve number sequences, patterns and word/number puzzles involving the base ten place value*

- **Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers including through zero.**
- *C: I can model positive and negative numbers using number lines*
- *T: I can interpret negative whole numbers in context, count forwards and backwards with positive and negative whole numbers including through zero.*
- *A: I can solve real-life problems involving positive and negative whole numbers*

- **Round any number up to 1000000 to the nearest 10, 100, 1000, 10000 and 100000**
- *C: I can model rounding to different place ten values*
- *T: I can round any number up to 1000000 to the nearest 10, 100, 1000, 10000 and 100000*
- *A: I can estimate and make approximations in real-life situations involving rounding*

- **Read Roman numerals to 1000 (M) and recognize years written in Roman numerals**
- *C: I can visually model values of Roman Numerals*
- *T: I can read Roman numerals to 1000 (M) and recognize years written in Roman numerals*
- *A: I can solve real-life problems involving Roman Numerals*

- **Solve number problems and practical problems that involve all of the above.**
- *C: I can select and use an appropriate sequence of operations and tools (number lines, number squares, manipulatives) to solve problems*
- *T: I can visually model my thinking when solving multistep problems*
- *A: I can solve number problems and practical problems that involve place value*

Number - Addition and Subtraction

- **Add and subtract numbers mentally with increasingly large numbers.**
- *C: I can model mental strategies for addition and subtraction visually for others*
- *T: Add and subtract numbers mentally with increasingly large numbers.*
- *A: I can solve real-life problems involving addition and subtraction mentally*

- **Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)**
- *C: I can model different written methods for solving addition and subtraction problems using diagrams and labelling*
- *T: Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)*
- *A: I can solve real-life problems using addition and subtraction methods*

- **Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.**
- *C: I can model rounding to different place values*
- *T: I can use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.*
- *A: I can use rounding to check calculations and determine level of accuracy when solving real-life problems*

- **Solve addition and subtraction multi-step problems in contexts deciding which operations and methods to use and why.**
- *C: I can select and use an appropriate sequence of operations and tools (number lines, number squares, manipulatives) to solve problems*
- *T: I can visually model my thinking when solving multistep problems*
- *A: I can solve addition and subtraction multi-step problems in contexts deciding which operations and methods to use and why.*

Number - Multiplication and Division

- **Multiply and divide numbers mentally drawing upon known facts.**
- *C: I can model mental strategies for multiplication and division visually for others*
- *T: I can multiply and divide numbers mentally drawing upon known facts.*
- *A: I can solve real-life problems using multiplication and division*

- **Multiply and divide whole numbers by 10, 100 and 1000.**
- *C: I can model what happens when multiplying or dividing by 10, 100, 1000 using diagrams and labelling*
- *T: I can multiply and divide whole numbers by 10, 100 and 1000.*
- *A: I can solve real-life problems using multiplication or division of 10, 100, 1000*

RWA Scope and Sequence - Mathematics - Number

Number

RWA Scope and Sequence - Mathematics - Number

Grade 5

Number - Place Value

- **Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit.**
- *C: I can model numbers to ten millions or beyond using manipulatives, place value blocks, place value charts, images*
- *T: I can read, write, order and compare numbers up to 10 000 000 and determine the value of each digit.*
- *A: I can solve number and real-life problems that involve all of the above.*

- **Round any whole number to a required degree of accuracy.**
- *C: I can model rounding whole numbers*
- *T: I can round any whole number to a required degree of accuracy.*
- *A: I can use rounding to evaluate the reasonableness of an answer I have calculated*

- **Solve number and practical problems that involve all of the above**
- *C: I can select and use an appropriate sequence of operations and tools (number lines, number squares, manipulatives) to solve problems*
- *T: I can visually model my thinking when solving multistep problems*
- *A: I can solve number and practical problems that involve all of the above*

- **Use negative numbers in context, and calculate intervals across zero.**
- *C: I can model negative numbers using manipulatives, number lines and place value blocks*
- *T: I can use negative numbers in context, and calculate intervals across zero.*
- *A: I can solve problems involving negative and positive numbers*

Number - Addition, Subtraction, Multiplication and Division

- **Solve addition and subtraction multi step problems in contexts, deciding which operations and methods to use and why.**
- *C: I can model different methods of addition and subtraction both visually and written form (place value blocks, number lines, written methods)*
- *T: I can visually model my thinking when solving multistep problems identifying the operations needing to be used*
- *A: I can solve addition and subtraction multi step problems in contexts, deciding which operations and methods to use and why.*

- **Multiply multi-digit number up to 4 digits by a 2 digit number using the formal written methods.**
- *C: I can model different methods for multiplication of 4 digit by 2 digit numbers visually and in written form (place value blocks, written method)*
- *T: I can multiply multi-digit number up to 4 digits by a 2 digit number using the formal written methods.*
- *A: I can solve real-life problems involving multiplication*

- **Divide numbers up to 4 digits by a 2 digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions or by rounding as appropriate for the context.**
- *C: I can model different methods for division of 4 digit by 2 digit numbers visually and in written form (place value blocks, written method) - including what to do with a remainder*
- *T: I can divide numbers up to 4 digits by a 2 digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions or by rounding as appropriate for the context.*
- *A: I can solve real-life problems involving multiplication*

- **Divide numbers up to 4 digits by a 2 digit number using the formal written method of short division, interpreting remainders according to context**
- *C: I can model different methods for division of 4 digit by 2 digit numbers visually and in written form (place value blocks, written method) - including what to do with a remainder*
- *T: I can divide numbers up to 4 digits by a 2 digit number using the formal written method of short division, interpreting remainders according to context*
- *A: I can solve real-life problems involving multiplication*

- **Perform mental calculations, including with mixed operations and large numbers**
- *C: I can visually model mental calculation strategies using diagrams and labels*
- *T: I can perform mental calculations, including with mixed operations and large numbers*
- *A: I can solve real-life problems using mental calculations*

- **Identify common factors, common multiples and prime numbers.**
- *C: I can model factors and prime numbers using manipulatives, number lines, and factor trees*
- *T: I can identify common factors, multiples and prime numbers.*
- *A: I can use factors, multiples and prime numbers to make problem solving more efficient.*

- **Use their knowledge of the order of operations to carry out calculations involving the four operations.**
- *C: I can model the order of operations using diagrams and labels*
- *T: I can use my knowledge of the order of operations to carry out calculations involving the four operations.*
- *A: I can solve real-life problems using the order of operations*

- **Solve problems involving addition, subtraction, multiplication and division**
- *C: I can select and use an appropriate sequence of operations and tools (number lines, number squares, manipulatives) to solve problems*
- *T: I can visually model my thinking when solving multistep problems*
- *A: I can solve problems involving addition, subtraction, multiplication and division*

- **Use estimation to check answers to calculations and determine in the context of a problem, an appropriate answer**
- *C: I can use rounding to estimate answers before solving problems.*
- *T: I can use estimation to check answers to calculations and determine in the context of a problem, an appropriate degree of accuracy.*
- *A: I can solve real-life problems using rounding and estimation when appropriate*

Number - Fractions

- **Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.**
- *C: I can model simplifying fractions using manipulatives, grids and shapes*
- *T: I can use common factors to simplify fractions: use common multiples to express fractions in the same denomination.*

