Maths

Data Handling

Phase 3

Year 3

IB Phase 3

Learners will continue to collect, organize, display and analyse data, developing an understanding of how different graphs highlight different aspects of data more efficiently. They will understand that scale can represent different quantities in graphs and that mode can be used to summarize a set of data. The learners will make the connection that probability is based on experimental events and can be expressed numerically.

Conceptual Understandings IB3

Data can be collected, organized, displayed and analysed in different ways.
Different graph forms highlight different aspects of data more efficiently.

Learning outcomes

Data Handling

Collect, organize and represent data (including bar graphs, pictograms, Venn diagrams and tally charts)

Interpret and draw conclusions by comparing more than one data representation

Probability

Describe likelihood of activities and events using appropriate vocabulary for example ‘likely', ‘unlikely', ‘certain', ‘impossible'

Identify and describe possible outcomes and recognise variation in results of chance experiments

Year 4

IB Phase 3

Learners will continue to collect, organize, display and analyse data, developing an understanding of how different graphs highlight different aspects of data more efficiently. They will understand that scale can represent different quantities in graphs and that mode can be used to summarize a set of data. The learners will make the connection that probability is based on experimental events and can be expressed numerically.

Conceptual Understandings IB3

Data can be collected, organized, displayed and analysed in different ways.
Different graph forms highlight different aspects of data more efficiently.

Data Handling

Collect, organize and represent data (including bar and line graphs, 3 ring Venn diagrams and Carroll diagrams) where one object or symbol can represent many data values

Interpret data and draw conclusions using a variety of scales

Describe the advantages and disadvantages of data representation forms

Probability

Describe and order likelihood of activities and events using appropriate vocabulary for example ‘likely', ‘unlikely', ‘certain', ‘impossible'

Identify familiar events that are dependent and independent of the occurrence of the other

Year 5

IB Phase 3

Learners will continue to collect, organize, display and analyse data, developing an understanding of how different graphs highlight different aspects of data more efficiently. They will understand that scale can represent different quantities in graphs and that mode can be used to summarize a set of data. The learners will make the connection that probability is based on experimental events and can be expressed numerically.

Conceptual Understandings IB3

Data can be collected, organized, displayed and analysed in different ways.
Different graph forms highlight different aspects of data more efficiently.

Pattern and Function

Phase 3

Year 3

IB Phase 3

Learners will analyse patterns and identify rules for patterns, developing the understanding that functions describe the relationship or rules that uniquely associate members of one set with members of another set. They will understand the inverse relationship between multiplication and division, and the associative and commutative properties of multiplication. They will be able to use their understanding of pattern and function to represent and make sense of real-life situations and, where appropriate, to solve problems involving the four operations.

Conceptual Understandings IB3

Functions are relationships or rules that uniquely associate members of one set with members of another set.
By analysing patterns and identifying rules for patterns it is possible to make predictions.

Learning outcomes

Pattern and Function

Investigate, describe and represent patterns with numbers and other symbols

Identify missing elements in patterns

Explore and describe number patterns in multiplication facts

Identify and describe the inverse relationship between addition and subtraction

Identify and describe patterns in odd and even numbers (including even + even = even)

Year 4

IB Phase 3

Learners will analyse patterns and identify rules for patterns, developing the understanding that functions describe the relationship or rules that uniquely associate members of one set with members of another set. They will understand the

inverse relationship between multiplication and division, and the associative and commutative properties of multiplication. They will be able to use their understanding of pattern and function to represent and make sense of real-life situations and, where appropriate, to solve problems involving the four operations.

Conceptual Understandings IB3

Functions are relationships or rules that uniquely associate members of one set with members of another set.
By analysing patterns and identifying rules for patterns it is possible to make predictions.

Pattern and Function

Investigate and represent patterns using words, symbols, numbers and tables

Identify rules for patterns to predict future terms

Explore and describe patterns in multiplication and division facts including their inverse relationship

Identify and describe properties of prime and composite numbers

Solve equivalent number sentences involving addition and subtraction to find unknown quantities

Year 5

IB Phase 3

Learners will analyse patterns and identify rules for patterns, developing the understanding that functions describe the relationship or rules that uniquely associate members of one set with members of another set. They will understand the inverse relationship between multiplication and division, and the associative and commutative properties of multiplication. They will be able to use their understanding of pattern and function to represent and make sense of real-life situations and, where appropriate, to solve problems involving the four operations.

Conceptual Understandings IB3

Functions are relationships or rules that uniquely associate members of one set with members of another set.
By analysing patterns and identifying rules for patterns it is possible to make predictions.

Pattern and Function

Investigate and represent patterns using words, symbols, numbers, tables and graphs

Identify rules for patterns to predict future terms

Identify and describe factors and multiples of whole numbers

Solve equivalent number sentences involving multiplication and division to find unknown quantities

Shape and Space

Phase 3

Year 3

IB 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.

Conceptual Understandings IB3

Changing the position of a shape does not alter its properties.
Shapes can be transformed in different ways.
Geometric shapes and vocabulary are useful for representing and describing objects and events in real-world situations.

Learning outcomes

2D and 3D Shape

Sort, describe, compare and label regular and irregular two-dimensional shapes and three-dimensional objects using appropriate vocabulary

Construct three-dimensional objects and recognize them in different orientations

Transformation and symmetry

Create and describe symmetrical patterns, pictures and shapes

Identify and draw lines of reflective symmetry in patterns, pictures and shapes

Location

Describe direction and position using mathematical language for example describing rotations: whole turn; half turn; quarter turn; clockwise and anti-clockwise

Create and interpret simple grid references to show position and pathways (e.g. A4)

Year 4

IB 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.

Conceptual Understandings IB3

Changing the position of a shape does not alter its properties.
Shapes can be transformed in different ways.
Geometric shapes and vocabulary are useful for representing and describing objects and events in real-world situations.

2D and 3D Shape

Sort, draw, describe and classify regular and irregular two-dimensional shapes and three-dimensional objects using appropriate vocabulary

Connect three-dimensional objects with their nets and other two-dimensional representations

Transformation and symmetry

Identify and record order of rotational symmetry

Describe translations, reflections and rotations of two-dimensional shapes

Location

Describe direction using the four compass points

Locate and record features on a grid using coordinates in the first quadrant

Year 5

IB 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.

Conceptual Understandings IB3

Changing the position of a shape does not alter its properties.
Shapes can be transformed in different ways.
Geometric shapes and vocabulary are useful for representing and describing objects and events in real-world situations.

2D and 3D Shape

Identify, describe, classify and visualize properties of triangles, quadrilaterals and polyhedrons using mathematical vocabulary

Construct three-dimensional objects from given dimensions

Transformation and symmetry

Transform, reduce and enlarge two-dimensional shapes

Describe and model congruency and similarity in two-dimensional shapes

Location

Describe direction using the eight compass points

Locate and record features on a grid using coordinates in two quadrants

Measurement

Phase 3

Year 3

IB Phase 3

Learners will continue to use standard units to measure objects, in particular developing their understanding of measuring perimeter, area and volume. They will select and use appropriate tools and units of measurement, and will be able to describe measures that fall between two numbers on a scale. The learners will be given the opportunity to construct meaning about the concept of an angle as a measure of rotation.

Conceptual Understandings IB3

Objects and events have attributes that can be measured using appropriate tools.
Relationships exist between standard units that measure the same attributes.

Learning outcomes

Measurement of shape and space

Estimate, compare and measure objects using standard units of measurement: length, mass, volume and capacity

Estimate, compare and measure area of objects nonstandard units

Identify and describe relationships between units of measure (eg: 10mm is the same as 1cm)

Measurement of time

Read and write the time to the quarter-hour and 5 minute intervals (past, to)

Estimate and compare lengths of time: second, minute, hour, day, week, months and years

Connect times to events in a day

Angle

Identify angles as measures of turn and compare angle sizes in everyday situations

Year 4

IB Phase 3

Learners will continue to use standard units to measure objects, in particular developing their understanding of measuring perimeter, area and volume. They will select and use appropriate tools and units of measurement, and will be able to describe measures that fall between two numbers on a scale. The learners will be given the opportunity to construct meaning about the concept of an angle as a measure of rotation.

Conceptual Understandings IB3

Objects and events have attributes that can be measured using appropriate tools.
Relationships exist between standard units that measure the same attributes.

Measurement of shape and space

Estimate, compare and measure objects using standard units of measurement:

Convert between units using whole numbers (e.g. 1 metre to 100 centimetres)

Measurement of time

Read and write the time to the minute and investigate the relationship between units of time

Convert between units of time

Describe time and duration using am and pm

Angle

Compare and classify angles using the language of right angle, acute and obtuse

Year 5

IB Phase 3

Learners will continue to use standard units to measure objects, in particular developing their understanding of measuring perimeter, area and volume. They will select and use appropriate tools and units of measurement, and will be able to describe measures that fall between two numbers on a scale. The learners will be given the opportunity to construct meaning about the concept of an angle as a measure of rotation.

Conceptual Understandings IB3

Objects and events have attributes that can be measured using appropriate tools.
Relationships exists between standard units that measure the same attributes.

Measurement of shape and space

Estimate, compare and measure objects using standard units of measurement:length, perimeter, mass, capacity, area, volume and temperature

Calculate and develop rules for determining area and perimeter of rectangles

Identify and describe the relationships between area and perimeter

Convert between units using decimals to at least one place (e.g. change 2.6 kg to 2600 g)

Measurement of time

Read, write and compare 12 and 24 hour time systems and convert between them

Connect 12 and 24 hour time to timetables

Solve problems involving difference in time

Angle

Estimate, compare, classify, measure and construct angles

Number

Phase 3

Year 3

Conceptual Understandings IB2

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.
Number operations can be modelled in a variety of ways.

Conceptual Understandings IB3

The base 10 place value system can

Learning outcomes

Place Value

Apply place value to partition and rename four-digit numbers

Skip count by twos, fives, tens and hundreds starting from a number other than zero

Recognise, model, represent and order four-digit numbers

Round numbers to the nearest 10 or 100

Four Operations

Recall addition facts of multiples of ten to at least 100 and related subtraction facts

Model addition and subtraction of whole numbers

Solve addition problems (including real life and word) using appropriate written and mental strategies

Add and subtract fractions with the same denominator using concrete material and pictorial representations

Solve subtraction problems (including real life and word) using appropriate written and mental strategies

Model multiplication and division using groups and/or arrays

Recall multiplication and division facts to at least two, five, three and ten times tables.

Solve multiplication problems (including real life and word) using appropriate written and mental strategies

Solve division problems (including real life and word) using written and mental strategies for division without remainders

Fractions

Use estimation and rounding to check the reasonableness of answers to calculations

Model, represent, compare and order fractions in a practical context

Use the language of fractions, for example, numerator, denominator

Find fractions of shapes and quantities

Model equivalent fractions

Year 4

IB Phase 3

Learners will develop the understanding that fractions and decimals are ways of representing whole-part relationships and will demonstrate this understanding by modelling equivalent fractions and decimal fractions to hundredths or beyond. They will be able to model, read, write, compare and order fractions, and use them in real-life situations. Learners will have automatic recall of addition, subtraction, multiplication and division facts. They will select, use and describe a range of strategies to solve problems involving addition, subtraction, multiplication and division, using estimation strategies to check the reasonableness of their answers.

Conceptual Understandings IB3

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.

Place Value

Apply place value to partition and rename five-digit numbers

Recognise, represent and order five-digit numbers

Round numbers to the nearest 10, 100, 1000

Four Operations

Model addition and subtraction of whole numbers

Solve addition problems (including real life and word) using a range of efficient mental and written strategies

Solve subtraction problems (including real life and word) using appropriate efficient mental and written strategies

Model multiplication and division using groups and/or arrays

Recall multiplication facts up to 10 × 10 and related division facts

Solve multiplication problems (including real life and word) using efficient mental and written strategies

Solve division problems (including real life and word) involving division by a one digit number, including those with remainders

Use estimation and rounding to check the reasonableness of answers to calculations

Fractions

Read, write, compare and order fractions

Use the language of fractions, for example, numerator, denominator

Find fractions of shapes, numbers and quantities

Investigate equivalent fractions used in context

Model addition and subtraction of fractions with related denominators

Model and compare improper fractions and mixed numbers

Count in quarters halves and thirds, including mixed numbers

Year 5

IB Phase 2

Learners will develop the understanding that fractions and decimals are ways of representing whole-part relationships and will demonstrate this understanding by modelling equivalent fractions and decimal fractions to hundredths or beyond. They will be able to model, read, write, compare and order fractions, and use them in real-life situations. Learners will have automatic recall of addition, subtraction, multiplication and division facts. They will select, use and describe a range of strategies to solve problems involving addition, subtraction, multiplication and division, using estimation strategies to check the reasonableness of their answers.

Conceptual Understandings IB2

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.

Place Value

Apply place value to partition and rename numbers to tenths and hundredths.

Recognise and order numbers to millions or beyond

Recognise, model and order decimal fractions to hundredths or beyond.

Round decimal fractions to the nearest whole number

Four Operations

Model addition and subtraction of decimal fractions up to hundredths

Solve addition problems including decimals in the form of money and measurement.

Solve subtraction problems including decimals in the form of money and measurement.

Uses known times tables facts to mentally multiply any 2 digit number by a 1 digit number

Solve problems (including real life and word) involving multiplication of large numbers by one- or two-digit numbers using efficient mental and written strategies

Use efficient mental and written strategies for division

Use estimation and rounding to check the reasonableness of answers to calculations

Fractions

Read, write, compare and order common fractions and decimal fractions to hundredths or beyond

Understand the relationship and convert between common fractions and decimal fractions

Simplify fractions to the lowest common denominator

Model, read, write and compare improper fractions and mixed numbers

Model, read, write and compare percentages understanding them as the number of parts in every 100

Model and solve simple problems involving ratio and proportion

Model and solve simple problems involving fractions