

# Maths

## Data Handling

### Level 3

#### IB Phase 2

Learners will understand how information can be expressed as organized and structured data and that this can occur in a range of ways. They will collect and represent data in different types of graphs, interpreting the resulting information for the purpose of answering questions. The learners will develop an understanding that some events in daily life are more likely to happen than others and they will identify and describe likelihood using appropriate vocabulary.

#### 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 IB2

Information can be expressed as organized and structured data.

Objects and events can be organized in different ways. Some events in daily life are more likely to happen than others.

#### 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

## Pattern and Function

### Level 3

#### IB Phase 2

Learners will understand that whole numbers exhibit patterns and relationships that can be observed and described, and that the patterns can be represented using numbers and other symbols. As a result, learners will understand the inverse relationship between addition and subtraction, and the associative and commutative properties of addition. They will be able to use their understanding of pattern to represent and make sense of real-life situations and, where appropriate, to solve problems involving addition and subtraction.

#### Conceptual Understandings IB2

Whole numbers exhibit patterns and relationships that can be observed and described.  
Patterns can be represented using numbers and other symbols.

#### 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)

## Shape and Space

### Level 3

#### IB 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.

#### Conceptual Understandings IB2

Shapes are classified and named according to their properties.  
Some shapes are made up of parts that repeat in some way.  
Specific vocabulary can be used to describe an object's position in space.

#### 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)



## Measurement

### Level 3

#### IB Phase 2

Learners will understand that standard units allow us to have a common language to measure and describe objects and events, and that while estimation is a strategy that can be applied for approximate measurements, particular tools allow us to measure and describe attributes of objects and events with more accuracy. Learners will develop these understandings in relation to measurement involving length, mass, capacity, money, temperature and time.

#### 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 IB2

Standard units allow us to have a common language to identify, compare, order and sequence objects and events.

We use tools to measure the attributes of objects and events.

Estimation allows us to measure with different levels of accuracy.

#### 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



## Number

### Level 3

#### IB Phase 2

Learners will develop their understanding of the base 10 place value system and will model, read, write, estimate, compare and order numbers to hundreds or beyond. They will have automatic recall of addition and subtraction facts and be able to model addition and subtraction of whole numbers using the appropriate mathematical language to describe their mental and written strategies. Learners will have an understanding of fractions as representations of whole-part relationships and will be able to model fractions and use fraction names in real-life situations.

#### 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 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

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

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

## Fractions

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

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