

## RAKA PYP Grade 3 / Year 3 Mathematics

### Number

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#### **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.

#### **Whole Numbers, Place Value, Estimation and Rounding**

- Read, write, model, numbers using the base ten system to 1000 and beyond (focus on manipulatives)
- Estimate quantities and answers to 1000
- Round numbers to the nearest 10 and 100.

#### **Counting and Ordering Numbers**

- Count in 1's, 2's, 3's 4's, 5's and 10's
- Count on and back from a given number to 1000
- Compare and order quantities to 1000
- Confidently use the signs for: equal to =, more than >, less than <, fewer, most, least

#### **Addition and Subtraction**

- Recall and use addition and subtraction facts (number stories) to 20 and beyond.
- Use and describe strategies to add or subtract mentally combinations of one-digit and two-digit numbers
- Model addition and subtraction to 100 partitioning tens and units. (addition with regrouping, subtraction without regrouping)

#### **Multiplication and Division**

- Recall all doubling facts to 40.
- Recognize number patterns in the multiplication tables to learn and use facts for: 2,3,4,5 and 10
- Multiply one-digit and two-digit numbers by 10 or 100, and describe the effect
- Understand division is the inverse of multiplication and use times table knowledge to derive division facts.
- Model 2 by 1 digit multiplication problems with 1 ten (e.g.  $16 \times 4$ )
- Division using related multiplication table facts. (e.g.  $56 \div 7 = 8$ , etc.)
- Understand that multiplication of 2 numbers can be done in any order (commutative) and division cannot (non- commutative)

#### **Fractions, Decimals, Percentages**

- Understand a fraction as the quantity when a whole is partitioned into equal parts
- read and write proper fractions, interpreting the denominator as the parts of a whole and the numerator as the number of equal parts
- Identify and represent simple fractions with denominators up to 10 using manipulatives, pictures and fractional notation
- Understand and model the concept of equivalence to 1 whole using common fractions (e.g. 1 whole = two halves, four quarters, three thirds)
- apply fractions in real life situations

### **Strategies and Problem Solving**

- Solve addition and subtraction in real-life situations using one and two steps
- Solve and explain word problems involving all four operations in real-life situations, using one step
- Select and explain an appropriate method of solving a problem
- explain methods and results in pictorial and or spoken form, using mathematical language and number sentences
- use manipulatives to represent numbers in multiple ways through partitioning, combining, grouping and sharing
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### ***Pattern and Function***

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#### **Conceptual understandings**

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.

- Reliably count by 2, 3, 4, 5, 10s and recognize patterns using a 100s chart
- Identify and describe repeating patterns using one or more attributes, and growing and shrinking patterns
- Recognize, create, describe and extend number sequences, visual and concrete patterns
- Understand and use the inverse relationship between addition and subtraction
- Begin to understand the inverse relationship between multiplication/ division (with manipulatives)
- Understand and use number patterns to make predictions and solve problems
- Select appropriate methods for representing patterns using words, symbols, pictures or tables
- Discuss rules relating two sets of data

### ***Measurement***

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#### **Conceptual understandings**

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

- Estimate, measure, label and compare using non-standard units of measurement: length, perimeter, area, time, capacity, mass and temperature
- Begin to understand that measures can fall between number on a measurement scale (e.g. 2.5 kg, 3 and 4 cm, etc.)
- Estimate and measure using centimetres, metres, grams, kilograms, and litres
- Understand the relationship between metric units (e.g. centimetres and metres)
- Begin to investigate area using arrays and centimetre grid paper (e.g. how many centimetre squares does it take to cover a rectangle.)
- Begin to investigate perimeter (e.g. measuring the length of a string wrapped around an object.)
- Select the appropriate tool and unit of measurement to solve real life problems
- Identify angles as measures of rotation and compare angle sizes in everyday situations (e.g. shapes, physical objects, computer images, etc.)
- Begin to compare and identify a range of angles – right for quarter, half and three quarter turns, clockwise and anticlockwise
- Begin to relate whole, half, and quarter turns to compass directions north, south, east, west [From Shape and Space]

- Read and write analogue and digital time to the nearest quarter hour, half-hour, hour
- Begin to measure and record time (hours, minutes, seconds)
- Understand the relationship between days, weeks, months and years
- Calculate time intervals in units of half an hour
- Begin to estimate, read and record positive temperatures to the nearest degree Celsius
- Investigate real-life problems involving addition and subtraction of money, including calculating change.

## *Shape and Space*

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### **Conceptual understandings**

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 Shapes**

- Sort, describe and identify 2D polygons and 3D shapes by geometric properties (e.g number of sides or vertices, number and shape of faces, etc.)
- Identify, describe and model congruency in 2D shapes and combine and transform 2D shapes to make another shape
- Identify and create symmetrical patterns
- Understand congruent or similar shapes
- Visualise, identify, describe and compare the properties of everyday shapes and objects
- Identify and describe 2D shapes on the surfaces of 3D shapes when viewing different orientations
- Visualise (create 'mental images' of) 2D and 3D shapes to develop descriptions for posing questions or giving clues about shapes
- Describe what could happen to a shape if geometric properties are modified

### **Location, Direction and Movement**

- Locate features on a grid using simple coordinates in the first quadrant
- Identify and list vocabulary that could be used to give directions or to locate or arrange places and objects
- Give and follow directions to familiar places in the school environment
- Give reasons for the choice of language used to describe movements and directions
- Determine the view to be represented when using a simple map, plan or grid to give directions, or to locate or arrange places or objects
- Begin to relate whole, half, and quarter turns to compass directions north, south, east, west

### **Conceptual understandings**

Data can be collected, organized, displayed and analysed in different ways. Different graph forms highlight different aspects of data more efficiently. Probability can be based on experimental events in daily life. Probability can be expressed in numerical notations.

- Gather data to answer a question, using a simple survey with a limited number of responses (e.g. What is your favorite colour?)
- Collect, organize and interpret data using bar graphs, pictographs, trees and Carroll and Venn diagrams and use mathematical language to describe the data (e.g. three more students walked to school than took the bus)
- Understand many-to-one correspondence (e.g. 1 symbol on a pictogram can represent 4 objects)
- Use the scale on the vertical axis to represent large quantities by 2s, 5s or 10s
- Pose and answer questions and draw conclusions about class-generated data in concrete graphs, pictographs, simple bar graphs, and tally charts. (e.g. The most popular color of people in our class is blue.)
- Use IT to create simple graphs (e.g. <https://nces.ed.gov/nceskids/createagraph/>)
- Describe possible outcomes for particular events and use everyday language to describe the likelihood of the outcomes occurring.
- To recognize situations where outcomes are certain, impossible or unpredictable.
- Determine fair and unfair games