

MARKHOR JUNIOR MATHEMATICS CURRICULUM

Elementary Level — Class 5 & Class 6

An Original International-Standard Mathematics Framework

Official Curriculum Document
Markhor Junior Contest
2026

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1. Introduction & Curriculum Philosophy

The Markhor Junior Mathematics Curriculum — Elementary Level (Class 5 & Class 6) is an original, internationally-benchmarked mathematics framework designed exclusively for the Markhor Junior Contest. It builds directly on the Learner Level (Class 3 & Class 4) and represents the most advanced primary-mathematics stage in the Markhor Junior progression, without referencing, naming or basing itself on any specific external competition or syllabus.

The Elementary Level follows the progression: Understand → Apply → Analyze → Reason → Strategize → Solve. Students move from applying known procedures toward analysing unfamiliar situations, reasoning about mathematical relationships, and strategically selecting an approach — always built from concepts genuinely within the Class 5 and Class 6 syllabus, and never from premature exposure to secondary mathematics.

This document is the official foundation for all future Markhor Junior Elementary Level materials, including MCQ question banks, practice tests, mock tests, past papers and contest papers for Class 5 and Class 6. Together with the Nursery/KG, Beginner and Learner Level documents, it completes the Markhor Junior primary mathematics progression: Nursery/KG → Beginner (Class 1–2) → Learner (Class 3–4) → Elementary (Class 5–6).

2. Curriculum Architecture

The curriculum follows a consistent architecture for every topic:

- Class → Mathematical Domain → Topic → Subtopics → Learning Outcomes → Skills → Difficulty → Assessment Mapping

Seventeen mathematical domains are used consistently across both classes, extending the Learner Level structure with percentages, ratio & proportion, and a dedicated perimeter/area/volume domain, and allowing the curriculum to scale cleanly into future Markhor Junior levels:

- Number & Number Sense (NS)
- Whole Number Operations (OP)
- Fractions (FR)
- Decimals (DC)
- Percentages (PC)
- Ratio & Proportion (RP)
- Patterns & Algebraic Thinking (PA)
- Geometry (GE)
- Perimeter, Area & Volume (AV)
- Measurement (ME)
- Time (TM)
- Money & Financial Mathematics (MO)
- Data Handling (DT)
- Probability & Chance (PR)
- Logical Reasoning (LR)
- Problem Solving (PS)
- Mental Mathematics & Estimation (MN)

3. Three-Tier Difficulty System

Every topic is structured across three difficulty levels. Challenge is created through hidden relationships, multiple conditions, strategic thinking, complex patterns and mathematical modelling — never simply through larger numbers or concepts outside the syllabus.

- Level 1 — Beginner: direct understanding and standard application of a concept.
- Level 2 — Intermediate: unfamiliar application, multi-step problems and reasoning.

- Level 3 — Challenge: advanced, competition-oriented, non-routine mathematical thinking, which may involve hidden relationships, multiple conditions, strategic thinking or multiple possible approaches.

4. Spiral Curriculum & Connection to Learner Level

The Elementary Level connects naturally with the Learner Level: Class 5 extends whole-number fluency and reasoning while formally introducing percentages, ratio & proportion, algebraic thinking and volume as substantial new domains. Class 6 then deepens every domain further — fraction and decimal multiplication/division, multi-step percentage and ratio reasoning, angle relationships, surface area, and genuinely advanced non-routine problem solving — without unnecessary repetition and without prematurely becoming a secondary-school syllabus. Section 9 of this document maps this progression domain by domain.

5. Mathematical Connections

Topics are not taught in isolation. Question writers should draw on these natural connections when designing reasoning and challenge-level items:

- Factors $\leftrightarrow$ Multiples (shared reasoning about number relationships)
- Fractions $\leftrightarrow$ Decimals $\leftrightarrow$ Percentages (equivalent representations of parts of a whole)
- Ratio $\leftrightarrow$ Proportion $\leftrightarrow$ Percentages (comparative and scaling reasoning)
- Multiplication $\leftrightarrow$ Area, Area $\leftrightarrow$ Volume (building measurement from arithmetic)
- Geometry $\leftrightarrow$ Measurement, Coordinates $\leftrightarrow$ Geometry (spatial reasoning grounded in number)
- Patterns $\leftrightarrow$ Algebra (rules, expressions and equations as generalised patterns)
- Data $\leftrightarrow$ Fractions/Percentages, Probability $\leftrightarrow$ Fractions (data and chance expressed numerically)
- Money $\leftrightarrow$ Decimals/Percentages (financial reasoning as an application of number)

6. Mathematical Communication

Alongside calculation, the Elementary Level develops students' ability to explain reasoning, interpret mathematical statements, identify errors, compare solution methods, justify answers and interpret graphs and tables. This is woven throughout every domain — particularly Logical Reasoning, Problem Solving and Geometry — rather than taught as an isolated topic, and is reflected in "error-detection" and "justify your answer" style questions across the question bank.

7. Standard Question Concept Levels

For every topic, future question writers and AI question-generation systems should design MCQs across seven standard question concepts, matched to the three-tier difficulty system: Basic Concept, Application, Reasoning, Visual, Mental Mathematics, Problem Solving, and Challenge. The "Recommended Question Types" field for each topic identifies which specific formats are most appropriate.

8. Standard Question Formats

The following question formats may be used across topics, as indicated in each topic's Recommended Question Types field:

- Standard MCQ · Visual MCQ · Number-based MCQ · Pattern question · Missing number
- Logical reasoning · Word problem · Multi-step problem · Data interpretation · Geometry question
- Fraction question · Decimal question · Ratio question · Percentage question · Probability question
- Measurement question · Mental maths question · Error-detection question · Comparison question · Picture-based MCQ

9. Curriculum Boundary

The Elementary Level is deliberately bounded to deepen understanding and reasoning within age-appropriate mathematics rather than introduce premature secondary-level content. Concepts explicitly kept outside this syllabus include: formal algebraic manipulation with variables on both sides of an equation, negative number arithmetic beyond comparison, division of a fraction by another fraction, compound interest and tax formulas, circumference/area formulas involving π , angle properties of parallel lines (alternate/co-interior/corresponding angles), formal permutation/combination calculations, and any statistics beyond mean and range. These remain appropriate targets for future Markhor Junior levels.

Markhor Junior Mathematics — Elementary Level — Class 5

Course Overview

Markhor Junior Mathematics — Elementary Level — Class 5 marks the transition into advanced primary mathematics. Students strengthen whole-number fluency, deepen fraction and decimal understanding, and are formally introduced to percentages, ratio & proportion, algebraic thinking, and perimeter, area & volume as substantial new domains. Structured problem solving, mental mathematics and logical reasoning are woven throughout, giving students a broad, connected mathematical toolkit as they progress toward the greater independence and reasoning demands of Class 6.

Mathematical Domains & Topics

Number & Number Sense

- Large Numbers & Place Value
- Factors, Multiples & Prime Numbers
- Divisibility Rules & Number Properties

Whole Number Operations

- Multi-Digit Operations & Order of Operations (Introduction)
- Mental Calculation Strategies
- Multi-Step Word Problems

Fractions

- Equivalent & Simplifying Fractions
- Comparing & Ordering Fractions
- Addition & Subtraction of Fractions
- Fraction of a Quantity & Word Problems

Decimals

- Decimal Place Value (to Thousandths)
- Decimal Operations (Add/Subtract/Multiply)
- Decimal Word Problems & Money

Percentages

- Introduction to Percentages
- Percentage of a Quantity

Ratio & Proportion

- Introduction to Ratio
- Simple Proportion & Scaling

Patterns & Algebraic Thinking

- Number Patterns & Sequences
- Introduction to Variables & Expressions
- Simple Equations

Geometry

- 2D Shape Properties & Angles
- Triangles & Quadrilaterals
- Symmetry, Reflection & Coordinates (Introduction)
- Angle Measurement & Reasoning

Perimeter, Area & Volume

- Perimeter of Composite Shapes
- Area of Rectangles & Triangles
- Introduction to Volume

Measurement

- Unit Conversion & Measurement Problems
- Measurement Estimation & Accuracy

Time

- 24-Hour Time & Elapsed Time
- Timelines, Calendars & Schedules

Money & Financial Mathematics

- Money Word Problems & Unit Price
- Discounts & Simple Percentage Applications

Data Handling

- Frequency Tables & Graphs
- Mean/Average & Range (Introduction)

Probability & Chance

- Introduction to Probability

Logical Reasoning

- Logic Puzzles & Classification
- Multi-Condition Reasoning Problems

Problem Solving

- Multi-Step Real-Life Problems

Mental Mathematics & Estimation

- Mental Math & Estimation Strategies

Detailed Topic-by-Topic Curriculum — Class 5

Domain: Number & Number Sense

1. Large Numbers & Place Value

Topic Code	C5-NS-01
Domain	Number & Number Sense
Subtopics	Numbers up to millions • Place-value charts • Reading/writing large numbers
Concept Description	Students read, write and represent numbers up to millions using place value.
Learning Outcomes	Students can identify the value of each digit in a large number and compare large numbers.
Skills Developed	Place-value reasoning, Number sense, Representation
Beginner (L1)	Identify the value of a digit in a 6-digit number.
Intermediate (L2)	Compare and order numbers up to one million.
Challenge (L3)	Solve a problem where regrouping across several place values changes the answer.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Number-based MCQ
Should Be Tested	Place value and comparison of numbers up to 1,000,000
Should NOT Be Tested	Numbers beyond one million

2. Factors, Multiples & Prime Numbers

Topic Code	C5-NS-02
Domain	Number & Number Sense
Subtopics	Factors and multiples • Prime and composite numbers • Divisibility rules (2,3,5,10)
Concept Description	Students find factors and multiples, classify numbers as prime or composite, and apply simple divisibility rules.
Learning Outcomes	Students can classify a number as prime or composite and apply a divisibility rule to check factors.
Skills Developed	Number relationships, Classification, Reasoning
Beginner (L1)	List the factors of a number up to 100.
Intermediate (L2)	Apply a divisibility rule to check whether a number is a factor.
Challenge (L3)	Classify numbers up to 100 as prime or composite and justify using divisibility rules.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Missing number
Should Be Tested	Factors/multiples/prime numbers up to 100; divisibility by 2, 3, 5, 10
Should NOT Be Tested	Formal prime factorisation using factor trees

3. Divisibility Rules & Number Properties

Topic Code	C5-NS-03
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Domain	Number & Number Sense
Subtopics	Divisibility by 4, 6, 9 • Odd/even properties • Number property puzzles
Concept Description	Students extend divisibility reasoning and explore properties of whole numbers.
Learning Outcomes	Students can apply divisibility rules to solve number-property problems.
Skills Developed	Number relationships, Reasoning, Pattern recognition
Beginner (L1)	Apply a single divisibility rule to a given number.
Intermediate (L2)	Combine two divisibility rules to solve a problem.
Challenge (L3)	Solve a puzzle requiring several number-property conditions at once.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Logical reasoning
Should Be Tested	Divisibility rules for 2, 3, 4, 5, 6, 9, 10
Should NOT Be Tested	Divisibility rules for 7, 11, 13 and beyond

Domain: Whole Number Operations

1. Multi-Digit Operations & Order of Operations (Introduction)

Topic Code	C5-OP-01
Domain	Whole Number Operations
Subtopics	Multi-digit add/subtract/multiply/divide • Order of operations (no brackets) • Checking with inverse operations
Concept Description	Students perform multi-digit operations fluently and apply a simple order of operations.
Learning Outcomes	Students can correctly evaluate an expression with more than one operation, applying the correct order.
Skills Developed	Arithmetic fluency, Order of operations, Checking strategies
Beginner (L1)	Evaluate an expression with addition and multiplication in the correct order.
Intermediate (L2)	Evaluate an expression with three operations in the correct order.
Challenge (L3)	Identify an error in an incorrectly ordered calculation and correct it.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Error-detection question
Should Be Tested	Order of operations without brackets, numbers within 10,000
Should NOT Be Tested	Order of operations with brackets and exponents

2. Mental Calculation Strategies

Topic Code	C5-OP-02
Domain	Whole Number Operations
Subtopics	Mental multiplication/division • Compensation and adjustment • Using known facts
Concept Description	Students apply efficient mental calculation strategies to whole-number operations.
Learning Outcomes	Students can select and apply an efficient mental strategy for a multi-digit calculation.

Skills Developed	Mental maths, Strategy selection, Number sense
Beginner (L1)	Apply a basic mental strategy to a two-digit calculation.
Intermediate (L2)	Apply a mental strategy involving compensation or adjustment.
Challenge (L3)	Choose the most efficient strategy among several for an unfamiliar calculation.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Mental maths question
Should Be Tested	Mental strategies within Class 5 number range
Should NOT Be Tested	Written algorithms disguised as mental maths

3. Multi-Step Word Problems

Topic Code	C5-OP-03
Domain	Whole Number Operations
Subtopics	Combined operations • Real-life planning contexts • Understand-Plan-Solve-Check approach
Concept Description	Students solve word problems requiring several connected whole-number operations.
Learning Outcomes	Students can plan and solve a multi-step word problem involving whole-number operations.
Skills Developed	Problem solving, Multi-step reasoning, Planning
Beginner (L1)	Solve a two-step problem with familiar numbers.
Intermediate (L2)	Solve a three-step problem within Class 5 number range.
Challenge (L3)	Solve a problem with an unfamiliar or layered context requiring careful planning.
Visual Priority	Medium
Recommended Question Types	Word problem, Multi-step problem
Should Be Tested	Two- and three-step problems using whole-number operations
Should NOT Be Tested	Problems requiring concepts beyond Class 5 scope

Domain: Fractions

1. Equivalent & Simplifying Fractions

Topic Code	C5-FR-01
Domain	Fractions
Subtopics	Finding equivalent fractions • Simplifying to lowest terms • Fraction reasoning
Concept Description	Students find equivalent fractions and simplify fractions to their lowest terms.
Learning Outcomes	Students can simplify a fraction to its lowest terms and generate equivalent fractions.
Skills Developed	Fraction reasoning, Number relationships, Simplification
Beginner (L1)	Identify an equivalent fraction from a given fraction.
Intermediate (L2)	Simplify a fraction to lowest terms using a common factor.
Challenge (L3)	Identify which of several fractions is already in lowest terms.
Visual Priority	Medium

Recommended Question Types	Standard MCQ, Picture-based MCQ
Should Be Tested	Equivalent/simplifying fractions with denominators up to 20
Should NOT Be Tested	Simplifying using formal HCF calculation

2. Comparing & Ordering Fractions

Topic Code	C5-FR-02
Domain	Fractions
Subtopics	Comparing unlike denominators • Common denominators • Ordering mixed sets
Concept Description	Students compare and order fractions with unlike denominators using common denominators.
Learning Outcomes	Students can compare two fractions with different denominators and order a set correctly.
Skills Developed	Comparison, Fraction reasoning, Number sense
Beginner (L1)	Compare two fractions with related denominators.
Intermediate (L2)	Compare two fractions with unrelated denominators using a common denominator.
Challenge (L3)	Order a mixed set of fractions, including improper fractions and mixed numbers.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Comparison question
Should Be Tested	Comparing/ordering fractions with denominators up to 20
Should NOT Be Tested	Comparing fractions with very large unrelated denominators

3. Addition & Subtraction of Fractions

Topic Code	C5-FR-03
Domain	Fractions
Subtopics	Same-denominator operations • Unlike-denominator operations • Mixed number operations
Concept Description	Students add and subtract fractions, including with unlike denominators and mixed numbers.
Learning Outcomes	Students can add or subtract two fractions, finding a common denominator when needed.
Skills Developed	Fraction fluency, Common denominators, Regrouping
Beginner (L1)	Add or subtract fractions with the same denominator.
Intermediate (L2)	Add or subtract fractions with unlike denominators.
Challenge (L3)	Add or subtract mixed numbers, including regrouping across whole numbers.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Picture-based MCQ
Should Be Tested	Fraction addition/subtraction with denominators up to 20
Should NOT Be Tested	Fraction multiplication or division

4. Fraction of a Quantity & Word Problems

Topic Code	C5-FR-04
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Domain	Fractions
Subtopics	Finding a fraction of a quantity • Real-life fraction problems • Multi-step fraction reasoning
Concept Description	Students find a fraction of a quantity and apply this to real-life word problems.
Learning Outcomes	Students can calculate a fraction of a quantity and solve a related word problem.
Skills Developed	Fraction reasoning, Application, Problem solving
Beginner (L1)	Find a unit fraction of a quantity.
Intermediate (L2)	Find a non-unit fraction of a quantity in a word problem.
Challenge (L3)	Solve a multi-step word problem combining fraction of a quantity with another operation.
Visual Priority	Medium
Recommended Question Types	Word problem, Standard MCQ
Should Be Tested	Fractions of quantities up to 1000
Should NOT Be Tested	Problems requiring fraction multiplication of two fractions

Domain: Decimals

1. Decimal Place Value (to Thousandths)

Topic Code	C5-DC-01
Domain	Decimals
Subtopics	Tenths, hundredths, thousandths • Reading/writing decimals • Decimal place-value charts
Concept Description	Students read, write and represent decimals to three decimal places.
Learning Outcomes	Students can identify the value of each digit in a decimal to thousandths.
Skills Developed	Decimal sense, Place-value reasoning, Representation
Beginner (L1)	Read a decimal number to two decimal places.
Intermediate (L2)	Read and represent a decimal number to three decimal places.
Challenge (L3)	Convert between a fraction and its decimal equivalent to three decimal places.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Picture-based MCQ
Should Be Tested	Decimals to three decimal places (thousandths)
Should NOT Be Tested	Decimals beyond thousandths

2. Decimal Operations (Add/Subtract/Multiply)

Topic Code	C5-DC-02
Domain	Decimals
Subtopics	Decimal addition/subtraction • Multiplying a decimal by a whole number • Estimating decimal results
Concept Description	Students add, subtract and multiply decimals, including by whole numbers.
Learning Outcomes	Students can add, subtract and multiply decimals accurately.

Skills Developed	Decimal fluency, Place-value reasoning, Estimation
Beginner (L1)	Add or subtract two decimals to two decimal places.
Intermediate (L2)	Multiply a decimal by a whole number.
Challenge (L3)	Solve a multi-step calculation combining decimal addition, subtraction and multiplication.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Missing number
Should Be Tested	Decimal add/subtract/multiply to three decimal places
Should NOT Be Tested	Decimal division; Decimal multiplication by another decimal

3. Decimal Word Problems & Money

Topic Code	C5-DC-03
Domain	Decimals
Subtopics	Real-life decimal problems • Money calculations • Comparing and ordering decimal amounts
Concept Description	Students apply decimal operations to solve real-life word problems, especially involving money.
Learning Outcomes	Students can solve a multi-step word problem involving decimal quantities or money.
Skills Developed	Problem solving, Decimal application, Number sense
Beginner (L1)	Solve a one-step decimal money word problem.
Intermediate (L2)	Solve a two-step decimal money word problem.
Challenge (L3)	Solve a multi-step problem combining decimal operations and comparison.
Visual Priority	Medium
Recommended Question Types	Word problem, Standard MCQ
Should Be Tested	Decimal word problems within realistic amounts
Should NOT Be Tested	Problems requiring decimal division

Domain: Percentages

1. Introduction to Percentages

Topic Code	C5-PC-01
Domain	Percentages
Subtopics	Meaning of percentage • Percentage as part of 100 • Percentage-fraction-decimal links
Concept Description	Students understand percentage as a way of expressing a part out of 100, connected to fractions and decimals.
Learning Outcomes	Students can convert between a simple percentage, fraction and decimal.
Skills Developed	Percentage sense, Number relationships, Representation
Beginner (L1)	Identify the percentage shown by a shaded grid of 100 squares.
Intermediate (L2)	Convert a simple percentage to a fraction or decimal.
Challenge (L3)	Convert between percentage, fraction and decimal for a less common value.

Visual Priority	High
Recommended Question Types	Picture-based MCQ, Standard MCQ
Should Be Tested	Percentages linked to simple fractions and decimals (multiples of 10, 25, 50)
Should NOT Be Tested	Percentages involving complex fractions

2. Percentage of a Quantity

Topic Code	C5-PC-02
Domain	Percentages
Subtopics	Finding a percentage of a number • Real-life percentage problems • Comparing percentages
Concept Description	Students calculate a percentage of a quantity and apply this to real-life problems.
Learning Outcomes	Students can calculate a simple percentage of a given quantity.
Skills Developed	Percentage reasoning, Application, Number sense
Beginner (L1)	Find 10% or 50% of a quantity.
Intermediate (L2)	Find 25%, 20% or 75% of a quantity.
Challenge (L3)	Solve a word problem requiring a percentage of a quantity in an unfamiliar context.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Word problem
Should Be Tested	Percentages of quantities using simple, familiar percentages
Should NOT Be Tested	Percentages requiring long or complex calculation

Domain: Ratio & Proportion

1. Introduction to Ratio

Topic Code	C5-RP-01
Domain	Ratio & Proportion
Subtopics	Ratio notation • Part-to-part ratios • Part-to-whole ratios
Concept Description	Students understand ratio as a way of comparing two or more quantities.
Learning Outcomes	Students can express a comparison between quantities as a ratio and interpret a given ratio.
Skills Developed	Ratio reasoning, Comparison, Representation
Beginner (L1)	Write a simple ratio from a picture or description.
Intermediate (L2)	Interpret a part-to-whole ratio in a real-life context.
Challenge (L3)	Solve a problem requiring both part-to-part and part-to-whole ratio reasoning.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Standard MCQ
Should Be Tested	Simple ratios with small whole-number terms
Should NOT Be Tested	Ratios involving three or more terms

2. Simple Proportion & Scaling

Topic Code	C5-RP-02
Domain	Ratio & Proportion
Subtopics	Equivalent ratios • Simple proportion problems • Scaling quantities up or down
Concept Description	Students use equivalent ratios to solve simple proportion and scaling problems.
Learning Outcomes	Students can find an equivalent ratio and use it to scale a quantity.
Skills Developed	Proportional reasoning, Ratio reasoning, Application
Beginner (L1)	Find an equivalent ratio by scaling both terms by the same factor.
Intermediate (L2)	Solve a simple proportion word problem (e.g. recipe scaling).
Challenge (L3)	Solve a multi-step proportion problem involving scaling in an unfamiliar context.
Visual Priority	Medium
Recommended Question Types	Word problem, Standard MCQ
Should Be Tested	Simple proportion problems with whole-number scale factors
Should NOT Be Tested	Proportion problems requiring algebraic cross-multiplication notation

Domain: Patterns & Algebraic Thinking

1. Number Patterns & Sequences

Topic Code	C5-PA-01
Domain	Patterns & Algebraic Thinking
Subtopics	Arithmetic sequences • Growing/shrinking patterns • Describing rules
Concept Description	Students identify, extend and describe the rule of arithmetic number sequences.
Learning Outcomes	Students can extend an arithmetic sequence and describe its rule in words.
Skills Developed	Pattern recognition, Early algebraic thinking, Reasoning
Beginner (L1)	Extend a simple arithmetic sequence by one or two terms.
Intermediate (L2)	Describe the rule of an arithmetic sequence in words.
Challenge (L3)	Predict a distant term in a sequence using its rule.
Visual Priority	Medium
Recommended Question Types	Pattern question, Standard MCQ
Should Be Tested	Arithmetic sequences within Class 5 number range
Should NOT Be Tested	Formal algebraic sequence formulas (nth term)

2. Introduction to Variables & Expressions

Topic Code	C5-PA-02
Domain	Patterns & Algebraic Thinking
Subtopics	Using a letter for an unknown • Writing simple expressions • Evaluating expressions
Concept Description	Students use a letter to represent an unknown value and write and evaluate simple expressions.

Learning Outcomes	Students can write a simple expression using a variable and evaluate it for a given value.
Skills Developed	Algebraic thinking, Representation, Reasoning
Beginner (L1)	Evaluate a simple expression (e.g. $n + 5$) for a given value of n .
Intermediate (L2)	Write a simple expression to represent a word description.
Challenge (L3)	Evaluate a two-operation expression for a given value.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Missing number
Should Be Tested	Simple one-variable expressions with one or two operations
Should NOT Be Tested	Expressions with multiple variables or exponents

3. Simple Equations

Topic Code	C5-PA-03
Domain	Patterns & Algebraic Thinking
Subtopics	Solving one-step equations • Balance model • Checking solutions
Concept Description	Students solve simple one-step equations using a balance model and check their solutions.
Learning Outcomes	Students can solve a one-step equation for an unknown value.
Skills Developed	Algebraic thinking, Inverse operations, Checking strategies
Beginner (L1)	Solve a one-step addition or subtraction equation.
Intermediate (L2)	Solve a one-step multiplication or division equation.
Challenge (L3)	Solve a simple two-step equation.
Visual Priority	Low
Recommended Question Types	Missing number, Standard MCQ
Should Be Tested	One-step equations; simple two-step equations as challenge
Should NOT Be Tested	Equations with variables on both sides

Domain: Geometry

1. 2D Shape Properties & Angles

Topic Code	C5-GE-01
Domain	Geometry
Subtopics	Polygon classification • Angle types • Angle sum reasoning (informal)
Concept Description	Students classify 2D shapes by their properties and reason informally about angles within them.
Learning Outcomes	Students can classify a polygon and identify the types of angles it contains.
Skills Developed	Shape reasoning, Angle reasoning, Classification
Beginner (L1)	Classify a polygon by its number of sides.
Intermediate (L2)	Identify the angle types within a given polygon.
Challenge (L3)	Reason informally about the angles in a polygon using known angle facts.

Visual Priority	High
Recommended Question Types	Picture-based MCQ, Shape reasoning
Should Be Tested	Polygon classification and informal angle-type reasoning
Should NOT Be Tested	Formal angle-sum proofs

2. Triangles & Quadrilaterals

Topic Code	C5-GE-02
Domain	Geometry
Subtopics	Types of triangles • Types of quadrilaterals • Properties and classification
Concept Description	Students classify triangles and quadrilaterals by their side and angle properties.
Learning Outcomes	Students can classify a triangle or quadrilateral using its properties.
Skills Developed	Shape reasoning, Classification, Visual reasoning
Beginner (L1)	Name a common triangle or quadrilateral type.
Intermediate (L2)	Classify a shape using two combined properties (sides and angles).
Challenge (L3)	Identify a shape from a description that could match more than one type.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Shape reasoning
Should Be Tested	Triangle types (equilateral, isosceles, scalene, right-angled); quadrilateral types
Should NOT Be Tested	Formal geometric proofs

3. Symmetry, Reflection & Coordinates (Introduction)

Topic Code	C5-GE-03
Domain	Geometry
Subtopics	Lines of symmetry • Reflection on a grid • Plotting points on a coordinate grid
Concept Description	Students identify symmetry, reflect shapes on a grid and plot points using ordered pairs.
Learning Outcomes	Students can reflect a simple shape on a grid and plot a given ordered pair.
Skills Developed	Spatial reasoning, Visual reasoning, Coordinate reasoning
Beginner (L1)	Identify a line of symmetry in a shape.
Intermediate (L2)	Plot a given ordered pair on a coordinate grid (first quadrant).
Challenge (L3)	Reflect a shape across a line on a coordinate grid.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Visual reasoning
Should Be Tested	Symmetry, reflection and coordinates in the first quadrant
Should NOT Be Tested	Coordinates involving negative values

4. Angle Measurement & Reasoning

Topic Code	C5-GE-04
Domain	Geometry
Subtopics	Measuring angles with a protractor • Angles on a straight line • Angles at a point
Concept Description	Students measure angles using a protractor and apply simple angle facts.
Learning Outcomes	Students can measure an angle and use angle facts to find a missing angle.
Skills Developed	Angle measurement, Reasoning, Application
Beginner (L1)	Measure a given angle using a protractor.
Intermediate (L2)	Find a missing angle on a straight line using the fact that angles sum to 180° .
Challenge (L3)	Find a missing angle at a point using the fact that angles sum to 360° .
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Standard MCQ
Should Be Tested	Angle measurement; angles on a line and at a point
Should NOT Be Tested	Angle properties of parallel lines (co-interior, alternate angles)

Domain: Perimeter, Area & Volume

1. Perimeter of Composite Shapes

Topic Code	C5-AV-01
Domain	Perimeter, Area & Volume
Subtopics	Perimeter of L-shapes and composite figures • Missing dimensions • Real-life applications
Concept Description	Students calculate the perimeter of composite shapes made from rectangles, finding missing dimensions.
Learning Outcomes	Students can calculate the perimeter of a composite shape, finding any missing side lengths first.
Skills Developed	Measurement reasoning, Spatial reasoning, Problem solving
Beginner (L1)	Find the perimeter of a composite shape with all sides given.
Intermediate (L2)	Find a missing side length in a composite shape before calculating perimeter.
Challenge (L3)	Solve a real-life problem requiring perimeter of an irregular composite shape.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Word problem
Should Be Tested	Perimeter of composite rectilinear shapes
Should NOT Be Tested	Perimeter involving curved edges

2. Area of Rectangles & Triangles

Topic Code	C5-AV-02
Domain	Perimeter, Area & Volume
Subtopics	Area formula for rectangles • Area formula for triangles • Composite area problems
Concept Description	Students calculate the area of rectangles and triangles and combine these for composite shapes.

Learning Outcomes	Students can calculate the area of a rectangle or triangle using the appropriate formula.
Skills Developed	Measurement reasoning, Formula application, Spatial reasoning
Beginner (L1)	Calculate the area of a rectangle given its length and width.
Intermediate (L2)	Calculate the area of a triangle given its base and height.
Challenge (L3)	Calculate the total area of a composite shape made of a rectangle and a triangle.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Word problem
Should Be Tested	Area of rectangles, squares and triangles ($\text{base} \times \text{height} \div 2$)
Should NOT Be Tested	Area of circles or other curved shapes

3. Introduction to Volume

Topic Code	C5-AV-03
Domain	Perimeter, Area & Volume
Subtopics	Meaning of volume • Cubic units • Volume of cubes and rectangular prisms
Concept Description	Students understand volume as the space occupied by a 3D object, measured in cubic units.
Learning Outcomes	Students can calculate the volume of a cube or rectangular prism by counting or using a formula.
Skills Developed	Spatial reasoning, Measurement reasoning, Formula application
Beginner (L1)	Count the cubic units filling a simple 3D shape shown visually.
Intermediate (L2)	Calculate the volume of a rectangular prism using $\text{length} \times \text{width} \times \text{height}$.
Challenge (L3)	Find a missing dimension given the volume of a rectangular prism.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Word problem
Should Be Tested	Volume of cubes and rectangular prisms by counting or formula
Should NOT Be Tested	Volume of cylinders, cones or other curved solids

Domain: Measurement

1. Unit Conversion & Measurement Problems

Topic Code	C5-ME-01
Domain	Measurement
Subtopics	Converting length/weight/capacity units • Metric relationships • Real-life measurement problems
Concept Description	Students convert between related metric units and apply this to real-life measurement problems.
Learning Outcomes	Students can convert a measurement between related metric units and solve a word problem.
Skills Developed	Unit conversion, Measurement reasoning, Application
Beginner (L1)	Convert between two closely related units (e.g. cm to m).
Intermediate (L2)	Convert between units involving decimals (e.g. 1250 g to kg).

Challenge (L3)	Solve a multi-step word problem requiring more than one unit conversion.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Word problem
Should Be Tested	Metric conversions (mm/cm/m/km, g/kg, ml/l) including decimal results
Should NOT Be Tested	Conversions between metric and imperial units

2. Measurement Estimation & Accuracy

Topic Code	C5-ME-02
Domain	Measurement
Subtopics	Estimating measurements • Choosing appropriate units • Reasonable measurement accuracy
Concept Description	Students estimate measurements sensibly and choose appropriate units and accuracy for a context.
Learning Outcomes	Students can estimate a measurement and select the most appropriate unit for a given context.
Skills Developed	Estimation, Measurement reasoning, Reasoning
Beginner (L1)	Choose the most appropriate unit for measuring a familiar object.
Intermediate (L2)	Estimate a measurement using a known reference point.
Challenge (L3)	Judge whether a given measurement estimate is reasonable and explain why.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Word problem
Should Be Tested	Estimation and unit choice for everyday measurements
Should NOT Be Tested	Formal precision/significant-figure concepts

Domain: Time

1. 24-Hour Time & Elapsed Time

Topic Code	C5-TM-01
Domain	Time
Subtopics	24-hour clock • Converting 12-hour to 24-hour • Elapsed time across AM/PM
Concept Description	Students read and convert 24-hour time and calculate elapsed time across the AM/PM boundary.
Learning Outcomes	Students can convert between 12-hour and 24-hour time and calculate elapsed time.
Skills Developed	Time reasoning, Conversion, Problem solving
Beginner (L1)	Convert a simple 12-hour time to 24-hour notation.
Intermediate (L2)	Calculate elapsed time between two 24-hour times.
Challenge (L3)	Solve a multi-step problem involving several activities in 24-hour time.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Word problem

Should Be Tested	24-hour time conversion and elapsed time within a day
Should NOT Be Tested	Time-zone calculations

2. Timelines, Calendars & Schedules

Topic Code	C5-TM-02
Domain	Time
Subtopics	Reading timelines • Multi-date calendar problems • Interpreting schedules/timetables
Concept Description	Students read timelines, calendars and schedules to solve real-life time-planning problems.
Learning Outcomes	Students can interpret a schedule or timetable to answer a real-life planning question.
Skills Developed	Time reasoning, Data reading, Problem solving
Beginner (L1)	Read a direct fact from a timetable or calendar.
Intermediate (L2)	Find the time between two entries in a schedule.
Challenge (L3)	Solve a multi-step planning problem using a timetable and calendar together.
Visual Priority	Medium
Recommended Question Types	Picture-based MCQ, Word problem
Should Be Tested	Reading and interpreting timetables, timelines and calendars
Should NOT Be Tested	Time-zone-based scheduling

Domain: Money & Financial Mathematics

1. Money Word Problems & Unit Price

Topic Code	C5-MO-01
Domain	Money & Financial Mathematics
Subtopics	Multi-item shopping problems • Unit price comparison • Best-value reasoning
Concept Description	Students solve money word problems and compare unit prices to reason about best value.
Learning Outcomes	Students can calculate a unit price and use it to determine the better-value option.
Skills Developed	Problem solving, Comparison, Application
Beginner (L1)	Find the total cost of several items.
Intermediate (L2)	Calculate a unit price and compare two options.
Challenge (L3)	Solve a multi-step best-value problem involving different package sizes.
Visual Priority	Medium
Recommended Question Types	Word problem, Comparison question
Should Be Tested	Unit price and best-value reasoning within realistic amounts
Should NOT Be Tested	Problems involving formal profit/loss percentage

2. Discounts & Simple Percentage Applications

Topic Code	C5-MO-02
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Domain	Money & Financial Mathematics
Subtopics	Percentage discounts • Sale price calculations • Real-life discount problems
Concept Description	Students apply percentage reasoning to calculate discounts and sale prices in real-life contexts.
Learning Outcomes	Students can calculate a discount amount and the resulting sale price.
Skills Developed	Percentage reasoning, Application, Problem solving
Beginner (L1)	Find the discount amount for a simple percentage off.
Intermediate (L2)	Find the sale price after a percentage discount.
Challenge (L3)	Solve a multi-step problem comparing two different discount offers.
Visual Priority	Medium
Recommended Question Types	Word problem, Standard MCQ
Should Be Tested	Simple percentage discounts using familiar percentages
Should NOT Be Tested	Compound discounts or discount plus tax calculations

Domain: Data Handling

1. Frequency Tables & Graphs

Topic Code	C5-DT-01
Domain	Data Handling
Subtopics	Frequency tables • Scaled bar graphs • Reading and constructing simple graphs
Concept Description	Students organise data into frequency tables and read scaled bar graphs.
Learning Outcomes	Students can complete a frequency table from raw data and read values from a scaled graph.
Skills Developed	Data organisation, Data reading, Interpretation
Beginner (L1)	Complete a simple frequency table from a small data set.
Intermediate (L2)	Read a value from a scaled bar graph, including between marked intervals.
Challenge (L3)	Answer a multi-step question combining frequency table and graph data.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Data interpretation
Should Be Tested	Frequency tables and scaled bar graphs
Should NOT Be Tested	Formal grouped-frequency distributions

2. Mean/Average & Range (Introduction)

Topic Code	C5-DT-02
Domain	Data Handling
Subtopics	Finding the mean of a small data set • Finding the range • Comparing data sets
Concept Description	Students calculate the mean and range of a small data set and use these to compare data.
Learning Outcomes	Students can calculate the mean and range of a small set of numbers.
Skills Developed	Data analysis, Arithmetic application, Comparison

Beginner (L1)	Find the range of a small data set.
Intermediate (L2)	Find the mean of a small data set (up to 5 values).
Challenge (L3)	Compare two data sets using their mean and range together.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Data interpretation
Should Be Tested	Mean and range of small, whole-number data sets
Should NOT Be Tested	Median, mode, or weighted averages

Domain: Probability & Chance

1. Introduction to Probability

Topic Code	C5-PR-01
Domain	Probability & Chance
Subtopics	Certain, impossible, likely, unlikely • Equally likely outcomes • Simple probability language
Concept Description	Students describe the likelihood of events using everyday probability language.
Learning Outcomes	Students can describe an event as certain, impossible, likely, unlikely or equally likely.
Skills Developed	Probability reasoning, Classification, Real-life application
Beginner (L1)	Classify a simple event as certain, impossible, likely or unlikely.
Intermediate (L2)	Compare the likelihood of two events using probability language.
Challenge (L3)	Order a set of events from least to most likely with justification.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Picture-based MCQ
Should Be Tested	Everyday probability language and comparison of likelihoods
Should NOT Be Tested	Numerical probability using fractions

Domain: Logical Reasoning

1. Logic Puzzles & Classification

Topic Code	C5-LR-01
Domain	Logical Reasoning
Subtopics	Number and shape logic puzzles • Classification puzzles • Odd one out reasoning
Concept Description	Students solve logic puzzles requiring classification and pattern-based reasoning.
Learning Outcomes	Students can solve a logic puzzle using classification or pattern reasoning.
Skills Developed	Logical reasoning, Classification, Pattern recognition
Beginner (L1)	Solve a simple classification puzzle.
Intermediate (L2)	Solve a puzzle requiring two combined classification rules.
Challenge (L3)	Solve a puzzle requiring several reasoning steps.

Visual Priority	Medium
Recommended Question Types	Standard MCQ, Logical reasoning
Should Be Tested	Puzzles built from Class 5 mathematical knowledge
Should NOT Be Tested	Puzzles requiring concepts beyond Class 5 scope

2. Multi-Condition Reasoning Problems

Topic Code	C5-LR-02
Domain	Logical Reasoning
Subtopics	Clue-based puzzles • Elimination reasoning • Organising information in a table
Concept Description	Students use multiple clues and systematic elimination to solve reasoning problems.
Learning Outcomes	Students can use several clues, often organised in a table, to solve a reasoning problem.
Skills Developed	Deductive reasoning, Systematic thinking, Elimination
Beginner (L1)	Use two clues to eliminate incorrect options.
Intermediate (L2)	Use three or four clues to find the correct answer.
Challenge (L3)	Solve a problem requiring an organised table of several interacting clues.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Logical reasoning
Should Be Tested	Multi-clue deduction problems with organisable information
Should NOT Be Tested	Complex multi-variable logic grids beyond Class 5 scope

Domain: Problem Solving

1. Multi-Step Real-Life Problems

Topic Code	C5-PS-01
Domain	Problem Solving
Subtopics	Problems across domains • Understand-Plan-Solve-Check-Explain approach • Real-life planning contexts
Concept Description	Students solve multi-step real-life problems that combine two or more mathematical domains.
Learning Outcomes	Students can plan, solve, check and explain a multi-step real-life problem.
Skills Developed	Problem solving, Multi-step reasoning, Self-checking
Beginner (L1)	Solve a two-step problem with familiar numbers.
Intermediate (L2)	Solve a three-step problem combining two domains (e.g. fractions and money).
Challenge (L3)	Solve a problem combining three or more domains with an unfamiliar context.
Visual Priority	Medium
Recommended Question Types	Word problem, Multi-step problem
Should Be Tested	Multi-step real-life problems built from Class 5 concepts
Should NOT Be Tested	Problems requiring concepts beyond Class 5 scope

Domain: Mental Mathematics & Estimation

1. Mental Math & Estimation Strategies

Topic Code	C5-MN-01
Domain	Mental Mathematics & Estimation
Subtopics	Mental strategies across operations • Estimating fraction/decimal/percentage results • Checking reasonableness
Concept Description	Students apply mental strategies and estimation across whole numbers, fractions, decimals and percentages.
Learning Outcomes	Students can estimate a result and judge whether a calculated answer is reasonable.
Skills Developed	Mental maths, Estimation, Reasoning
Beginner (L1)	Estimate the result of a two-number calculation by rounding.
Intermediate (L2)	Estimate a fraction, decimal or percentage result mentally.
Challenge (L3)	Identify the most reasonable of several answers without calculating exactly.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Mental maths question
Should Be Tested	Mental estimation across whole numbers, fractions, decimals, percentages
Should NOT Be Tested	Formal significant-figure rounding

Markhor Junior Mathematics — Elementary Level — Class 6

Course Overview

Markhor Junior Mathematics — Elementary Level — Class 6 represents the most advanced stage of Markhor Junior primary mathematics: pre-secondary reasoning and advanced problem solving. Students multiply and divide fractions and decimals, apply percentage increase/decrease and proportional reasoning, work with algebraic expressions and equations, reason about angles and surface area, and interpret more complex data and probability. Non-routine, competition-style problem solving and mathematical communication are emphasised throughout, preparing students for confident, independent mathematical reasoning as they progress beyond the Elementary Level.

Mathematical Domains & Topics

Number & Number Sense

- Prime Factorization & HCF/LCM
- Positive & Negative Numbers (Introduction)
- Number Properties & Reasoning

Whole Number Operations

- Order of Operations & Multi-Step Calculations
- Efficient Mental Strategies for Larger Numbers

Fractions

- Multiplying Fractions
- Dividing Simple Fractions
- Mixed Number Operations
- Multi-Step Fraction Word Problems

Decimals

- Decimal Multiplication & Division
- Fluency & Reasoning with Decimals
- Decimal Word Problems (Multi-Step)

Percentages

- Percentage–Decimal–Fraction Connections
- Percentage Increase/Decrease
- Percentage Word Problems

Ratio & Proportion

- Equivalent Ratios & Simplifying
- Ratio Word Problems
- Proportional Reasoning & Scaling

Patterns & Algebraic Thinking

- Arithmetic Sequences & Rules
- Expressions & Substitution
- Solving Equations (Multi-Step)
- Inequality (Introduction)

Geometry

- Angle Relationships & Reasoning
- Circles (Introductory Properties)

- Coordinate Geometry & Transformations
- Shape Composition & Decomposition
- Geometric Reasoning (Informal)

Perimeter, Area & Volume

- Perimeter & Area of Composite Figures
- Area of Triangles & Parallelograms
- Volume of Cubes & Cuboids
- Surface Area (Introduction)

Measurement

- Complex Unit Conversion
- Measurement Word Problems (Multi-Step)

Time

- Time-Zone Awareness & Real-Life Time Problems
- Multi-Step Elapsed Time Problems

Money & Financial Mathematics

- Budgeting & Financial Reasoning
- Multi-Step Money & Percentage Problems

Data Handling

- Mean, Range & Data Comparison
- Line Graphs & Scaled Graphs
- Multi-Step Data Interpretation

Probability & Chance

- Probability Using Fractions
- Comparing Likelihoods & Experimental Probability

Logical Reasoning

- Multi-Condition Logic Puzzles
- Arrangement & Elimination Problems
- Strategy & Non-Routine Puzzles

Problem Solving

- Multi-Step Problems Across Domains
- Non-Routine Challenge Problems

Mental Mathematics & Estimation

- Mental Strategies for Fractions, Decimals & Percentages
- Estimation & Reasonableness (Advanced)

Detailed Topic-by-Topic Curriculum — Class 6

Domain: Number & Number Sense

1. Prime Factorization & HCF/LCM

Topic Code	C6-NS-01
Domain	Number & Number Sense
Subtopics	Prime factorization (factor trees) • Highest common factor • Lowest common multiple
Concept Description	Students find the prime factorization of a number and use it to find the HCF and LCM of two numbers.
Learning Outcomes	Students can find the prime factorization of a number and use it to find the HCF or LCM of two numbers.
Skills Developed	Number relationships, Factorization, Reasoning
Beginner (L1)	Find the prime factorization of a number up to 50 using a factor tree.
Intermediate (L2)	Find the HCF or LCM of two numbers by listing factors/multiples.
Challenge (L3)	Find the HCF and LCM of two numbers using prime factorization and solve a related word problem.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Missing number
Should Be Tested	Prime factorization, HCF and LCM of numbers up to 100
Should NOT Be Tested	Prime factorization of numbers beyond 100

2. Positive & Negative Numbers (Introduction)

Topic Code	C6-NS-02
Domain	Number & Number Sense
Subtopics	Number lines with negatives • Comparing positive/negative numbers • Real-life contexts (temperature, altitude)
Concept Description	Students understand negative numbers in real-life contexts and compare them on a number line.
Learning Outcomes	Students can place positive and negative numbers on a number line and compare them.
Skills Developed	Number sense, Comparison, Real-life application
Beginner (L1)	Place a positive or negative number on a number line.
Intermediate (L2)	Compare two numbers where one or both are negative.
Challenge (L3)	Solve a real-life problem involving a rise or fall through zero (e.g. temperature change).
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Standard MCQ
Should Be Tested	Comparing and ordering positive/negative numbers; simple real-life contexts
Should NOT Be Tested	Formal addition/subtraction of negative numbers

3. Number Properties & Reasoning

Topic Code	C6-NS-03
Domain	Number & Number Sense
Subtopics	Square and cube numbers • Number relationship puzzles • Combining number properties
Concept Description	Students explore square and cube numbers and solve puzzles combining several number properties.
Learning Outcomes	Students can identify square and cube numbers and use number properties to solve a puzzle.
Skills Developed	Number sense, Pattern recognition, Reasoning
Beginner (L1)	Identify a square number up to 144.
Intermediate (L2)	Identify a cube number up to 125.
Challenge (L3)	Solve a puzzle requiring reasoning about several number properties together (e.g. prime and square).
Visual Priority	Low
Recommended Question Types	Standard MCQ, Logical reasoning
Should Be Tested	Square numbers to 144, cube numbers to 125, combined property reasoning
Should NOT Be Tested	Square roots or cube roots by calculation

Domain: Whole Number Operations

1. Order of Operations & Multi-Step Calculations

Topic Code	C6-OP-01
Domain	Whole Number Operations
Subtopics	Order of operations with brackets • Multi-step calculations • Checking with inverse operations
Concept Description	Students apply the correct order of operations, including brackets, to multi-step calculations.
Learning Outcomes	Students can correctly evaluate an expression involving brackets and several operations.
Skills Developed	Order of operations, Arithmetic fluency, Checking strategies
Beginner (L1)	Evaluate an expression with brackets and two operations.
Intermediate (L2)	Evaluate an expression with brackets and three or more operations.
Challenge (L3)	Identify and correct an error in an incorrectly evaluated multi-step expression.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Error-detection question
Should Be Tested	Order of operations including brackets, numbers within 100,000
Should NOT Be Tested	Expressions involving exponents beyond simple squares

2. Efficient Mental Strategies for Larger Numbers

Topic Code	C6-OP-02
Domain	Whole Number Operations
Subtopics	Mental strategies for larger numbers • Combining known facts • Strategy comparison and justification

Concept Description	Students apply and justify efficient mental strategies for calculations with larger numbers.
Learning Outcomes	Students can select, apply and justify an efficient mental strategy for a larger-number calculation.
Skills Developed	Mental maths, Strategy selection, Communication
Beginner (L1)	Apply a mental strategy to a calculation involving multiples of 10, 100 or 1000.
Intermediate (L2)	Apply a mental strategy combining multiplication and addition/subtraction.
Challenge (L3)	Compare two mental strategies and justify which is more efficient for a given problem.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Mental maths question
Should Be Tested	Mental strategies within Class 6 number range
Should NOT Be Tested	Written algorithms disguised as mental maths

Domain: Fractions

1. Multiplying Fractions

Topic Code	C6-FR-01
Domain	Fractions
Subtopics	Fraction $\times$ whole number • Fraction $\times$ fraction • Visual models for multiplication
Concept Description	Students multiply fractions by whole numbers and by other fractions using visual models and procedures.
Learning Outcomes	Students can multiply a fraction by a whole number or by another fraction.
Skills Developed	Fraction fluency, Visual reasoning, Procedural understanding
Beginner (L1)	Multiply a fraction by a whole number.
Intermediate (L2)	Multiply two proper fractions.
Challenge (L3)	Solve a multi-step problem requiring fraction multiplication in context.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Standard MCQ
Should Be Tested	Multiplying fractions by whole numbers and by other fractions
Should NOT Be Tested	Multiplying mixed numbers without converting first

2. Dividing Simple Fractions

Topic Code	C6-FR-02
Domain	Fractions
Subtopics	Whole number $\div$ fraction • Fraction $\div$ whole number • Visual models for division
Concept Description	Students divide whole numbers by fractions and fractions by whole numbers using visual models.
Learning Outcomes	Students can divide a whole number by a unit fraction or a fraction by a whole number.
Skills Developed	Fraction reasoning, Visual reasoning, Procedural understanding

Beginner (L1)	Divide a fraction by a whole number.
Intermediate (L2)	Divide a whole number by a unit fraction using a visual model.
Challenge (L3)	Solve a word problem requiring simple fraction division.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Standard MCQ
Should Be Tested	Simple fraction division as described (whole $\div$ unit fraction; fraction $\div$ whole)
Should NOT Be Tested	Division of a fraction by another fraction

3. Mixed Number Operations

Topic Code	C6-FR-03
Domain	Fractions
Subtopics	Adding/subtracting mixed numbers • Converting for multiplication • Multi-step mixed-number problems
Concept Description	Students add, subtract and multiply mixed numbers, converting between forms as needed.
Learning Outcomes	Students can add, subtract or multiply mixed numbers accurately.
Skills Developed	Fraction fluency, Conversion, Multi-step reasoning
Beginner (L1)	Add two mixed numbers with the same denominator.
Intermediate (L2)	Subtract mixed numbers, including regrouping.
Challenge (L3)	Multiply two mixed numbers by first converting to improper fractions.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Missing number
Should Be Tested	Mixed number addition, subtraction and multiplication
Should NOT Be Tested	Mixed number division

4. Multi-Step Fraction Word Problems

Topic Code	C6-FR-04
Domain	Fractions
Subtopics	Real-life fraction problems • Combined fraction operations • Fraction reasoning in context
Concept Description	Students solve multi-step word problems combining several fraction operations.
Learning Outcomes	Students can plan and solve a multi-step word problem involving fractions.
Skills Developed	Problem solving, Fraction fluency, Multi-step reasoning
Beginner (L1)	Solve a one-step fraction word problem.
Intermediate (L2)	Solve a two-step fraction word problem combining two operations.
Challenge (L3)	Solve a multi-step fraction word problem with an unfamiliar or layered context.
Visual Priority	Medium
Recommended Question Types	Word problem, Multi-step problem
Should Be Tested	Multi-step fraction word problems built from Class 6 fraction skills

Should NOT Be Tested	Problems requiring fraction division by another fraction
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Domain: Decimals

1. Decimal Multiplication & Division

Topic Code	C6-DC-01
Domain	Decimals
Subtopics	Multiplying decimals • Dividing a decimal by a whole number • Dividing by powers of 10
Concept Description	Students multiply decimals and divide decimals by whole numbers and by powers of 10.
Learning Outcomes	Students can multiply two decimals and divide a decimal by a whole number accurately.
Skills Developed	Decimal fluency, Place-value reasoning, Procedural understanding
Beginner (L1)	Multiply or divide a decimal by 10 or 100.
Intermediate (L2)	Multiply a decimal by a whole number.
Challenge (L3)	Multiply two decimals together and estimate to check the answer's reasonableness.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Mental maths question
Should Be Tested	Decimal multiplication and division by whole numbers/powers of 10
Should NOT Be Tested	Division of a decimal by another decimal

2. Fluency & Reasoning with Decimals

Topic Code	C6-DC-02
Domain	Decimals
Subtopics	Mixed decimal operations • Decimal reasoning problems • Error detection in decimal calculations
Concept Description	Students apply decimal operations fluently and reason about decimal calculations, including spotting errors.
Learning Outcomes	Students can solve a mixed decimal calculation and identify an error in a decimal calculation.
Skills Developed	Decimal fluency, Reasoning, Error detection
Beginner (L1)	Solve a two-step calculation combining decimal addition and multiplication.
Intermediate (L2)	Identify an error in a decimal calculation and correct it.
Challenge (L3)	Solve a multi-step decimal reasoning problem with an unfamiliar structure.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Error-detection question
Should Be Tested	Mixed decimal operations and reasoning within Class 6 scope
Should NOT Be Tested	Recurring decimals or decimal-to-fraction conversion of non-terminating decimals

3. Decimal Word Problems (Multi-Step)

Topic Code	C6-DC-03
Domain	Decimals
Subtopics	Real-life multi-step decimal problems • Money and measurement contexts • Combining decimal operations
Concept Description	Students solve multi-step real-life word problems involving decimal operations.
Learning Outcomes	Students can plan and solve a multi-step word problem involving decimal operations.
Skills Developed	Problem solving, Decimal fluency, Multi-step reasoning
Beginner (L1)	Solve a two-step decimal word problem.
Intermediate (L2)	Solve a three-step decimal word problem in a money or measurement context.
Challenge (L3)	Solve a multi-step decimal problem with an unfamiliar or layered context.
Visual Priority	Medium
Recommended Question Types	Word problem, Multi-step problem
Should Be Tested	Multi-step decimal word problems built from Class 6 decimal skills
Should NOT Be Tested	Problems requiring decimal division by another decimal

Domain: Percentages

1. Percentage–Decimal–Fraction Connections

Topic Code	C6-PC-01
Domain	Percentages
Subtopics	Converting between all three forms • Ordering mixed representations • Choosing the most useful form
Concept Description	Students convert fluently between percentages, decimals and fractions and choose the most useful form for a task.
Learning Outcomes	Students can convert between a percentage, decimal and fraction representing the same value.
Skills Developed	Number relationships, Representation, Reasoning
Beginner (L1)	Convert a simple percentage to a decimal or fraction.
Intermediate (L2)	Convert a less common percentage (e.g. 35%) to a fraction in lowest terms.
Challenge (L3)	Order a mixed set of percentages, decimals and fractions from smallest to largest.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Comparison question
Should Be Tested	Conversions among percentages, decimals and fractions within Class 6 scope
Should NOT Be Tested	Percentages involving recurring decimal equivalents

2. Percentage Increase/Decrease

Topic Code	C6-PC-02
Domain	Percentages
Subtopics	Percentage increase • Percentage decrease • Real-life applications

Concept Description	Students calculate a percentage increase or decrease and apply this to real-life situations.
Learning Outcomes	Students can calculate the result of a percentage increase or decrease applied to a quantity.
Skills Developed	Percentage reasoning, Application, Multi-step calculation
Beginner (L1)	Calculate a simple percentage increase (e.g. 10%) on a quantity.
Intermediate (L2)	Calculate a percentage decrease and find the resulting value.
Challenge (L3)	Solve a multi-step problem involving a percentage increase followed by a decrease (or vice versa).
Visual Priority	Medium
Recommended Question Types	Word problem, Standard MCQ
Should Be Tested	Percentage increase/decrease using familiar percentages
Should NOT Be Tested	Compound percentage change (interest-style) calculations

3. Percentage Word Problems

Topic Code	C6-PC-03
Domain	Percentages
Subtopics	Real-life percentage problems • Percentage comparison • Multi-step percentage reasoning
Concept Description	Students apply percentage reasoning to solve multi-step real-life word problems.
Learning Outcomes	Students can plan and solve a multi-step percentage word problem.
Skills Developed	Problem solving, Percentage reasoning, Multi-step reasoning
Beginner (L1)	Solve a one-step percentage word problem.
Intermediate (L2)	Solve a two-step percentage word problem.
Challenge (L3)	Solve a multi-step percentage problem comparing two or more scenarios.
Visual Priority	Medium
Recommended Question Types	Word problem, Multi-step problem
Should Be Tested	Multi-step percentage word problems built from Class 6 skills
Should NOT Be Tested	Problems requiring compound interest or tax formulas

Domain: Ratio & Proportion

1. Equivalent Ratios & Simplifying

Topic Code	C6-RP-01
Domain	Ratio & Proportion
Subtopics	Simplifying ratios • Finding equivalent ratios • Ratios in lowest terms
Concept Description	Students simplify ratios to their lowest terms and find equivalent ratios.
Learning Outcomes	Students can simplify a ratio to its lowest terms and generate equivalent ratios.
Skills Developed	Ratio reasoning, Simplification, Number relationships
Beginner (L1)	Simplify a simple two-term ratio.

Intermediate (L2)	Find an equivalent ratio by scaling both terms.
Challenge (L3)	Simplify a ratio involving three terms or larger numbers.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Missing number
Should Be Tested	Simplifying and finding equivalent ratios, including three-term ratios
Should NOT Be Tested	Ratios involving algebraic terms

2. Ratio Word Problems

Topic Code	C6-RP-02
Domain	Ratio & Proportion
Subtopics	Sharing in a given ratio • Real-life ratio problems • Combining ratio with other operations
Concept Description	Students solve real-life word problems involving sharing a quantity in a given ratio.
Learning Outcomes	Students can divide a quantity according to a given ratio and solve a related word problem.
Skills Developed	Problem solving, Ratio reasoning, Application
Beginner (L1)	Share a quantity between two parts in a simple ratio.
Intermediate (L2)	Share a quantity between three parts in a given ratio.
Challenge (L3)	Solve a multi-step ratio word problem combining sharing with another operation.
Visual Priority	Medium
Recommended Question Types	Word problem, Standard MCQ
Should Be Tested	Sharing quantities in a given ratio (two or three parts)
Should NOT Be Tested	Ratio problems requiring algebraic equation setup

3. Proportional Reasoning & Scaling

Topic Code	C6-RP-03
Domain	Ratio & Proportion
Subtopics	Direct proportion • Scaling recipes/maps • Unitary method
Concept Description	Students use the unitary method and direct proportion to solve scaling problems.
Learning Outcomes	Students can use the unitary method to solve a direct proportion problem.
Skills Developed	Proportional reasoning, Problem solving, Application
Beginner (L1)	Scale a quantity up or down by a whole-number factor.
Intermediate (L2)	Use the unitary method to find the value of one unit, then scale.
Challenge (L3)	Solve a multi-step proportion problem in an unfamiliar real-life context.
Visual Priority	Medium
Recommended Question Types	Word problem, Standard MCQ
Should Be Tested	Direct proportion problems using the unitary method
Should NOT Be Tested	Inverse proportion problems

Domain: Patterns & Algebraic Thinking

1. Arithmetic Sequences & Rules

Topic Code	C6-PA-01
Domain	Patterns & Algebraic Thinking
Subtopics	Extending sequences • Describing rules algebraically • Finding a term from its position
Concept Description	Students describe the rule of an arithmetic sequence and use it to find a term from its position.
Learning Outcomes	Students can find a term in an arithmetic sequence given its position, using the sequence rule.
Skills Developed	Pattern recognition, Algebraic thinking, Reasoning
Beginner (L1)	Extend an arithmetic sequence by several terms.
Intermediate (L2)	Describe the rule of a sequence in words and use it to find a nearby term.
Challenge (L3)	Find a term far along a sequence using its rule without listing every term.
Visual Priority	Medium
Recommended Question Types	Pattern question, Standard MCQ
Should Be Tested	Arithmetic sequences within Class 6 number range
Should NOT Be Tested	Formal nth-term algebraic formulas

2. Expressions & Substitution

Topic Code	C6-PA-02
Domain	Patterns & Algebraic Thinking
Subtopics	Writing expressions from word descriptions • Substituting values • Simplifying simple expressions
Concept Description	Students write algebraic expressions from word descriptions and evaluate them by substitution.
Learning Outcomes	Students can write an expression from a word description and evaluate it by substituting a value.
Skills Developed	Algebraic thinking, Representation, Procedural fluency
Beginner (L1)	Substitute a value into a one-operation expression.
Intermediate (L2)	Write an expression from a word description and substitute a value.
Challenge (L3)	Simplify a simple expression by combining like terms before substituting.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Missing number
Should Be Tested	Simple expressions with one variable, substitution with whole numbers
Should NOT Be Tested	Expressions with multiple variables or negative coefficients

3. Solving Equations (Multi-Step)

Topic Code	C6-PA-03
Domain	Patterns & Algebraic Thinking
Subtopics	Two-step equations • Balance model • Checking solutions by substitution

Concept Description	Students solve two-step equations using a balance model and check their solutions.
Learning Outcomes	Students can solve a two-step equation for an unknown value and verify the solution.
Skills Developed	Algebraic thinking, Inverse operations, Checking strategies
Beginner (L1)	Solve a one-step equation.
Intermediate (L2)	Solve a two-step equation involving two different operations.
Challenge (L3)	Solve a two-step equation and verify the solution by substitution.
Visual Priority	Low
Recommended Question Types	Missing number, Standard MCQ
Should Be Tested	One- and two-step equations with a single variable
Should NOT Be Tested	Equations with variables on both sides or fractional coefficients

4. Inequality (Introduction)

Topic Code	C6-PA-04
Domain	Patterns & Algebraic Thinking
Subtopics	Greater than / less than with unknowns • Representing inequalities on a number line • Simple inequality reasoning
Concept Description	Students understand simple inequalities and represent them on a number line.
Learning Outcomes	Students can represent a simple inequality on a number line and identify values that satisfy it.
Skills Developed	Algebraic thinking, Number sense, Representation
Beginner (L1)	Identify whether a given value satisfies a simple inequality.
Intermediate (L2)	Represent a simple inequality (e.g. $x > 5$) on a number line.
Challenge (L3)	Find all whole-number values that satisfy a given inequality within a range.
Visual Priority	Medium
Recommended Question Types	Picture-based MCQ, Standard MCQ
Should Be Tested	Simple one-step inequalities with whole numbers
Should NOT Be Tested	Solving multi-step inequalities algebraically

Domain: Geometry

1. Angle Relationships & Reasoning

Topic Code	C6-GE-01
Domain	Geometry
Subtopics	Angles on a line and at a point • Vertically opposite angles • Angles in triangles and quadrilaterals
Concept Description	Students apply angle facts to find missing angles in a variety of geometric situations.
Learning Outcomes	Students can find a missing angle using angle facts about lines, points, triangles or quadrilaterals.
Skills Developed	Angle reasoning, Geometric reasoning, Problem solving
Beginner (L1)	Find a missing angle on a straight line or at a point.

Intermediate (L2)	Find a missing angle in a triangle using the angle sum of 180° .
Challenge (L3)	Find a missing angle in a multi-step diagram combining several angle facts.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Standard MCQ
Should Be Tested	Angle facts for lines, points, triangles and quadrilaterals
Should NOT Be Tested	Angle properties of parallel lines (alternate, co-interior, corresponding)

2. Circles (Introductory Properties)

Topic Code	C6-GE-02
Domain	Geometry
Subtopics	Centre, radius, diameter • Circumference (informal) • Real-life circle contexts
Concept Description	Students identify the parts of a circle and understand the relationship between radius and diameter.
Learning Outcomes	Students can identify the centre, radius and diameter of a circle and relate radius to diameter.
Skills Developed	Shape reasoning, Visual reasoning, Number relationships
Beginner (L1)	Identify the radius or diameter of a circle from a diagram.
Intermediate (L2)	Find the diameter given the radius, or vice versa.
Challenge (L3)	Solve a real-life problem involving the radius or diameter of a circular object.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Standard MCQ
Should Be Tested	Radius, diameter and basic circle vocabulary
Should NOT Be Tested	Circumference or area formulas involving π

3. Coordinate Geometry & Transformations

Topic Code	C6-GE-03
Domain	Geometry
Subtopics	Four-quadrant coordinates • Reflection and translation • Describing transformations
Concept Description	Students plot and read coordinates in all four quadrants and describe simple transformations.
Learning Outcomes	Students can plot a point in any quadrant and describe a reflection or translation.
Skills Developed	Coordinate reasoning, Spatial reasoning, Communication
Beginner (L1)	Plot a point in the first quadrant.
Intermediate (L2)	Plot a point in any of the four quadrants.
Challenge (L3)	Describe the transformation that maps one shape to another on a coordinate grid.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Visual reasoning
Should Be Tested	Four-quadrant coordinates; reflection and translation
Should NOT Be Tested	Rotation by non-right-angle amounts; Enlargement/scale factor transformations

4. Shape Composition & Decomposition

Topic Code	C6-GE-04
Domain	Geometry
Subtopics	Combining shapes • Splitting composite shapes • Identifying shapes within a figure
Concept Description	Students combine and split shapes to solve problems involving composite figures.
Learning Outcomes	Students can decompose a composite figure into simpler shapes to solve a problem.
Skills Developed	Spatial reasoning, Visual reasoning, Problem solving
Beginner (L1)	Identify the simple shapes that make up a composite figure.
Intermediate (L2)	Split a composite figure into simpler shapes to help solve a problem.
Challenge (L3)	Solve a problem requiring an unfamiliar or non-obvious decomposition of a figure.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Visual reasoning
Should Be Tested	Composition/decomposition of shapes within Class 6 geometric scope
Should NOT Be Tested	Decomposition involving curved shapes

5. Geometric Reasoning (Informal)

Topic Code	C6-GE-05
Domain	Geometry
Subtopics	Justifying shape properties • Explaining angle relationships • Comparing solution methods
Concept Description	Students explain and justify geometric reasoning using known shape and angle properties.
Learning Outcomes	Students can justify a geometric conclusion using known properties, without formal proof notation.
Skills Developed	Geometric reasoning, Mathematical communication, Justification
Beginner (L1)	State a property that justifies a simple geometric fact.
Intermediate (L2)	Explain why a given angle or shape conclusion is true using known properties.
Challenge (L3)	Compare two different valid explanations for the same geometric conclusion.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Logical reasoning
Should Be Tested	Informal justification using known Class 5–6 geometry facts
Should NOT Be Tested	Formal two-column or axiomatic proofs

Domain: Perimeter, Area & Volume

1. Perimeter & Area of Composite Figures

Topic Code	C6-AV-01
Domain	Perimeter, Area & Volume

Subtopics	Composite rectilinear figures • Missing dimensions • Combining perimeter and area reasoning
Concept Description	Students calculate the perimeter and area of composite figures made from rectangles and triangles.
Learning Outcomes	Students can calculate both the perimeter and area of a composite figure.
Skills Developed	Measurement reasoning, Spatial reasoning, Multi-step problem solving
Beginner (L1)	Calculate the area of a composite figure with all dimensions given.
Intermediate (L2)	Find a missing dimension in a composite figure before calculating area or perimeter.
Challenge (L3)	Solve a real-life problem requiring both perimeter and area of an unfamiliar composite figure.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Word problem
Should Be Tested	Perimeter and area of composite rectilinear and triangular figures
Should NOT Be Tested	Figures involving curved edges

2. Area of Triangles & Parallelograms

Topic Code	C6-AV-02
Domain	Perimeter, Area & Volume
Subtopics	Area of a parallelogram • Area of a triangle ($\text{base} \times \text{height} \div 2$) • Composite area with triangles/parallelograms
Concept Description	Students calculate the area of triangles and parallelograms and combine these in composite figures.
Learning Outcomes	Students can calculate the area of a triangle or parallelogram using the correct formula.
Skills Developed	Measurement reasoning, Formula application, Spatial reasoning
Beginner (L1)	Calculate the area of a parallelogram given base and height.
Intermediate (L2)	Calculate the area of a triangle given base and height.
Challenge (L3)	Calculate the area of a composite figure combining a triangle and a parallelogram.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Word problem
Should Be Tested	Area of triangles and parallelograms using $\text{base} \times \text{height}$
Should NOT Be Tested	Area of trapeziums or other quadrilaterals requiring different formulas

3. Volume of Cubes & Cuboids

Topic Code	C6-AV-03
Domain	Perimeter, Area & Volume
Subtopics	Volume formula ($\text{length} \times \text{width} \times \text{height}$) • Missing dimensions • Real-life volume problems
Concept Description	Students calculate the volume of cubes and cuboids and solve related real-life problems.
Learning Outcomes	Students can calculate the volume of a cuboid and find a missing dimension given the volume.
Skills Developed	Measurement reasoning, Formula application, Problem solving
Beginner (L1)	Calculate the volume of a cube given its side length.

Intermediate (L2)	Calculate the volume of a cuboid given its three dimensions.
Challenge (L3)	Find a missing dimension of a cuboid given its volume and the other two dimensions.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Word problem
Should Be Tested	Volume of cubes and cuboids
Should NOT Be Tested	Volume of prisms with non-rectangular cross-sections

4. Surface Area (Introduction)

Topic Code	C6-AV-04
Domain	Perimeter, Area & Volume
Subtopics	Nets of cubes/cuboids • Calculating surface area by summing faces • Real-life surface area contexts
Concept Description	Students calculate the surface area of a cube or cuboid by finding and summing the area of each face.
Learning Outcomes	Students can calculate the surface area of a cube or cuboid using its net or face dimensions.
Skills Developed	Spatial reasoning, Measurement reasoning, Multi-step calculation
Beginner (L1)	Identify the faces of a cuboid from its net.
Intermediate (L2)	Calculate the surface area of a cube given its side length.
Challenge (L3)	Calculate the surface area of a cuboid with three different dimensions.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Word problem
Should Be Tested	Surface area of cubes and cuboids via face-by-face calculation
Should NOT Be Tested	Surface area of cylinders or other curved solids

Domain: Measurement

1. Complex Unit Conversion

Topic Code	C6-ME-01
Domain	Measurement
Subtopics	Multi-step conversions • Converting between area units (intro) • Real-life conversion problems
Concept Description	Students perform multi-step unit conversions, including an introduction to converting units of area.
Learning Outcomes	Students can perform a multi-step unit conversion and apply it to a real-life problem.
Skills Developed	Unit conversion, Multi-step reasoning, Application
Beginner (L1)	Convert a measurement requiring one conversion step.
Intermediate (L2)	Convert a measurement requiring two conversion steps.
Challenge (L3)	Solve a real-life problem requiring conversion plus a further calculation.
Visual Priority	Medium

Recommended Question Types	Standard MCQ, Word problem
Should Be Tested	Multi-step metric conversions; introductory area-unit conversion (cm^2 to m^2 with given relationship)
Should NOT Be Tested	Conversions between metric and imperial units

2. Measurement Word Problems (Multi-Step)

Topic Code	C6-ME-02
Domain	Measurement
Subtopics	Combined measurement types • Real-life planning problems • Multi-step reasoning with units
Concept Description	Students solve multi-step word problems combining different measurement types and unit conversions.
Learning Outcomes	Students can solve a multi-step measurement word problem combining more than one measurement type.
Skills Developed	Problem solving, Unit conversion, Multi-step reasoning
Beginner (L1)	Solve a two-step measurement word problem.
Intermediate (L2)	Solve a three-step measurement word problem involving conversion.
Challenge (L3)	Solve a measurement problem combining two different measurement types and a real-life constraint.
Visual Priority	Medium
Recommended Question Types	Word problem, Multi-step problem
Should Be Tested	Multi-step measurement problems built from Class 6 skills
Should NOT Be Tested	Problems requiring concepts beyond Class 6 scope

Domain: Time

1. Time-Zone Awareness & Real-Life Time Problems

Topic Code	C6-TM-01
Domain	Time
Subtopics	Basic time-zone concept • Comparing times in different places • Real-life scheduling contexts
Concept Description	Students develop an age-appropriate awareness of time zones and apply this to simple real-life problems.
Learning Outcomes	Students can compare times in two locations given a simple time-zone difference.
Skills Developed	Time reasoning, Real-life application, Reasoning
Beginner (L1)	State the time in a second location given a whole-number hour difference.
Intermediate (L2)	Solve a simple problem involving a scheduled call or event across two time zones.
Challenge (L3)	Solve a multi-step problem involving time zones and elapsed time together.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Word problem

Should Be Tested	Simple whole-number-hour time-zone awareness
Should NOT Be Tested	Time zones with non-whole-number or daylight-saving complexities

2. Multi-Step Elapsed Time Problems

Topic Code	C6-TM-02
Domain	Time
Subtopics	Elapsed time across multiple events • Combining durations • Real-life scheduling problems
Concept Description	Students calculate elapsed time across multiple connected events and combine several durations.
Learning Outcomes	Students can solve a multi-step problem involving elapsed time across several connected events.
Skills Developed	Time reasoning, Multi-step problem solving, Application
Beginner (L1)	Find the elapsed time for one event with a clear start and end.
Intermediate (L2)	Combine the durations of two or three events to find a total time.
Challenge (L3)	Solve a scheduling problem requiring elapsed time across several events with gaps.
Visual Priority	Medium
Recommended Question Types	Word problem, Multi-step problem
Should Be Tested	Multi-step elapsed time and scheduling problems within a day or two
Should NOT Be Tested	Time-zone-based multi-day scheduling

Domain: Money & Financial Mathematics

1. Budgeting & Financial Reasoning

Topic Code	C6-MO-01
Domain	Money & Financial Mathematics
Subtopics	Planning a budget • Prioritising spending • Saving toward multiple goals
Concept Description	Students apply mathematical reasoning to age-appropriate budgeting and financial-planning scenarios.
Learning Outcomes	Students can plan a budget across several categories and reason about spending priorities.
Skills Developed	Problem solving, Real-life reasoning, Multi-step application
Beginner (L1)	Check whether a budget covers a list of planned expenses.
Intermediate (L2)	Allocate a budget across two or three categories to meet given goals.
Challenge (L3)	Solve a multi-step budgeting problem involving saving toward more than one goal.
Visual Priority	Medium
Recommended Question Types	Word problem, Multi-step problem
Should Be Tested	Age-appropriate budgeting and saving scenarios
Should NOT Be Tested	Formal financial concepts (interest, loans, taxes)

2. Multi-Step Money & Percentage Problems

Topic Code	C6-MO-02
Domain	Money & Financial Mathematics
Subtopics	Combined money and percentage problems • Discount and comparison problems • Real-life financial word problems
Concept Description	Students solve multi-step word problems combining money calculations with percentage reasoning.
Learning Outcomes	Students can solve a multi-step word problem combining money and percentage calculations.
Skills Developed	Problem solving, Percentage reasoning, Multi-step application
Beginner (L1)	Solve a two-step problem combining a money total with a simple percentage.
Intermediate (L2)	Solve a three-step problem combining discount, total and comparison.
Challenge (L3)	Solve a multi-step problem comparing two different money/percentage scenarios.
Visual Priority	Medium
Recommended Question Types	Word problem, Multi-step problem
Should Be Tested	Multi-step money and percentage problems within Class 6 scope
Should NOT Be Tested	Problems requiring compound interest or tax formulas

Domain: Data Handling

1. Mean, Range & Data Comparison

Topic Code	C6-DT-01
Domain	Data Handling
Subtopics	Calculating the mean • Finding the range • Comparing two data sets using mean/range
Concept Description	Students calculate the mean and range of larger data sets and use these to compare two sets of data.
Learning Outcomes	Students can calculate the mean and range of a data set and use them to compare two data sets.
Skills Developed	Data analysis, Arithmetic application, Comparison
Beginner (L1)	Find the mean of a data set with up to 6 values.
Intermediate (L2)	Find the mean and range of a data set with up to 10 values.
Challenge (L3)	Compare two data sets using mean and range and draw a justified conclusion.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Data interpretation
Should Be Tested	Mean and range of data sets with whole-number values
Should NOT Be Tested	Median, mode or standard deviation

2. Line Graphs & Scaled Graphs

Topic Code	C6-DT-02
Domain	Data Handling
Subtopics	Reading line graphs • Plotting simple line graphs • Interpreting trends

Concept Description	Students read and interpret line graphs, including identifying and describing simple trends.
Learning Outcomes	Students can read a value from a line graph and describe a trend it shows.
Skills Developed	Data reading, Interpretation, Communication
Beginner (L1)	Read a single value from a line graph.
Intermediate (L2)	Describe whether a line graph shows an increasing, decreasing or steady trend.
Challenge (L3)	Answer a multi-step question requiring comparison of two points or sections on a line graph.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Data interpretation
Should Be Tested	Reading and interpreting line graphs with numeric scales
Should NOT Be Tested	Graphs requiring rate-of-change (gradient) calculation

3. Multi-Step Data Interpretation

Topic Code	C6-DT-03
Domain	Data Handling
Subtopics	Combining data from multiple sources • Justifying conclusions with evidence • Multi-step data word problems
Concept Description	Students interpret and combine data from more than one table or graph to solve multi-step problems.
Learning Outcomes	Students can combine information from two data sources to answer a multi-step question.
Skills Developed	Data interpretation, Multi-step reasoning, Communication
Beginner (L1)	Answer a direct question using one data source.
Intermediate (L2)	Combine two related pieces of data to answer a question.
Challenge (L3)	Solve a multi-step problem requiring evidence from two different data displays.
Visual Priority	Medium
Recommended Question Types	Data interpretation, Multi-step problem
Should Be Tested	Multi-step interpretation combining tables, bar graphs or line graphs
Should NOT Be Tested	Formal statistical hypothesis-style reasoning

Domain: Probability & Chance

1. Probability Using Fractions

Topic Code	C6-PR-01
Domain	Probability & Chance
Subtopics	Expressing probability as a fraction • Simple probability calculations • Probability from equally likely outcomes
Concept Description	Students express the probability of a simple event as a fraction based on equally likely outcomes.
Learning Outcomes	Students can calculate the probability of a simple event as a fraction.
Skills Developed	Probability reasoning, Fraction application, Number sense

Beginner (L1)	Express the probability of a simple event (e.g. rolling a specific number) as a fraction.
Intermediate (L2)	Calculate the probability of an event with more than one favourable outcome.
Challenge (L3)	Compare the probabilities of two different events expressed as fractions.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Standard MCQ
Should Be Tested	Probability as a fraction from equally likely outcomes (dice, spinners, cards)
Should NOT Be Tested	Combined/compound probability of two independent events

2. Comparing Likelihoods & Experimental Probability

Topic Code	C6-PR-02
Domain	Probability & Chance
Subtopics	Comparing theoretical probabilities • Simple experimental probability • Real-life probability reasoning
Concept Description	Students compare theoretical probabilities and explore simple experimental probability from data.
Learning Outcomes	Students can compare the likelihood of two events and calculate a simple experimental probability from given results.
Skills Developed	Probability reasoning, Data interpretation, Comparison
Beginner (L1)	Compare the theoretical probability of two simple events.
Intermediate (L2)	Calculate an experimental probability from a small set of trial results.
Challenge (L3)	Compare a theoretical probability with an experimental result and reason about the difference.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Data interpretation
Should Be Tested	Comparing likelihoods; simple experimental probability from given data
Should NOT Be Tested	Formal statistical significance testing

Domain: Logical Reasoning

1. Multi-Condition Logic Puzzles

Topic Code	C6-LR-01
Domain	Logical Reasoning
Subtopics	Puzzles with several conditions • Systematic elimination • Organising information in tables/grids
Concept Description	Students solve puzzles requiring the simultaneous use of several logical conditions, organised systematically.
Learning Outcomes	Students can solve a puzzle by systematically applying and organising several logical conditions.
Skills Developed	Logical reasoning, Systematic thinking, Elimination
Beginner (L1)	Solve a puzzle using two or three conditions.
Intermediate (L2)	Solve a puzzle using four conditions, organised in a table.
Challenge (L3)	Solve a puzzle using five or more interacting conditions.

Visual Priority	Medium
Recommended Question Types	Standard MCQ, Logical reasoning
Should Be Tested	Multi-condition puzzles built from Class 6 concepts
Should NOT Be Tested	Puzzles requiring formal logic notation

2. Arrangement & Elimination Problems

Topic Code	C6-LR-02
Domain	Logical Reasoning
Subtopics	Arrangement puzzles • Ordering with constraints • Systematic elimination strategies
Concept Description	Students solve problems requiring the arrangement of items or people subject to given constraints.
Learning Outcomes	Students can solve an arrangement problem by systematically applying given constraints.
Skills Developed	Logical reasoning, Systematic thinking, Problem solving
Beginner (L1)	Arrange a small number of items using one constraint.
Intermediate (L2)	Arrange items using two or three combined constraints.
Challenge (L3)	Solve an arrangement problem with several interacting constraints and more than one valid strategy.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Logical reasoning
Should Be Tested	Arrangement/elimination problems with a small, manageable set of items
Should NOT Be Tested	Formal permutation/combination calculations

3. Strategy & Non-Routine Puzzles

Topic Code	C6-LR-03
Domain	Logical Reasoning
Subtopics	Strategic thinking puzzles • Efficient-solution puzzles • Multiple-approach problems
Concept Description	Students solve puzzles requiring strategic thinking and compare different valid approaches.
Learning Outcomes	Students can solve a strategy puzzle and explain their chosen approach.
Skills Developed	Strategic thinking, Non-routine problem solving, Communication
Beginner (L1)	Solve a strategy puzzle with a clear, guided first step.
Intermediate (L2)	Solve a strategy puzzle requiring the student to choose their own approach.
Challenge (L3)	Solve a genuinely unfamiliar strategy puzzle and compare it with an alternative approach.
Visual Priority	Medium
Recommended Question Types	Logical reasoning, Standard MCQ
Should Be Tested	Strategy puzzles built from Class 6 mathematical knowledge
Should NOT Be Tested	Puzzles requiring concepts beyond Class 6 scope

Domain: Problem Solving

1. Multi-Step Problems Across Domains

Topic Code	C6-PS-01
Domain	Problem Solving
Subtopics	Problems combining several domains • Understand-Plan-Choose-Solve-Check-Explain approach • Real-life multi-domain contexts
Concept Description	Students solve multi-step problems that combine two or more mathematical domains from across the curriculum.
Learning Outcomes	Students can plan, solve, check and explain a multi-step problem combining several domains.
Skills Developed	Problem solving, Multi-step reasoning, Self-checking
Beginner (L1)	Solve a two-domain problem with familiar numbers (e.g. money and fractions).
Intermediate (L2)	Solve a three-step problem combining two or three domains.
Challenge (L3)	Solve a problem combining three or more domains with an unfamiliar context.
Visual Priority	Medium
Recommended Question Types	Word problem, Multi-step problem
Should Be Tested	Multi-step, multi-domain real-life problems built from Class 6 concepts
Should NOT Be Tested	Problems requiring concepts beyond Class 6 scope

2. Non-Routine Challenge Problems

Topic Code	C6-PS-02
Domain	Problem Solving
Subtopics	Unfamiliar problem types • Hidden relationships • Competition-style strategic reasoning
Concept Description	Students apply strategic, flexible thinking to genuinely unfamiliar, competition-style problems.
Learning Outcomes	Students can approach an unfamiliar problem strategically, trying more than one approach if needed.
Skills Developed	Non-routine problem solving, Strategic thinking, Perseverance
Beginner (L1)	Solve a non-routine problem with a guided first step.
Intermediate (L2)	Solve a non-routine problem combining two or three known concepts.
Challenge (L3)	Solve a genuinely unfamiliar, multi-condition competition-style problem.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Logical reasoning, Word problem
Should Be Tested	Non-routine problems built from Class 6 concepts only
Should NOT Be Tested	Problems requiring concepts beyond Class 6 scope

Domain: Mental Mathematics & Estimation

1. Mental Strategies for Fractions, Decimals & Percentages

Topic Code	C6-MN-01
Domain	Mental Mathematics & Estimation
Subtopics	Mental fraction/decimal/percentage facts • Quick conversions • Strategy selection
Concept Description	Students apply mental strategies to fraction, decimal and percentage calculations without written working.
Learning Outcomes	Students can mentally solve or estimate a fraction, decimal or percentage calculation.
Skills Developed	Mental maths, Number relationships, Strategy selection
Beginner (L1)	Recall a common fraction-decimal-percentage equivalence mentally.
Intermediate (L2)	Mentally estimate the result of a fraction or percentage calculation.
Challenge (L3)	Choose the most efficient mental approach among fraction, decimal or percentage methods for the same problem.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Mental maths question
Should Be Tested	Mental strategies across fractions, decimals and percentages within Class 6 scope
Should NOT Be Tested	Written algorithms disguised as mental maths

2. Estimation & Reasonableness (Advanced)

Topic Code	C6-MN-02
Domain	Mental Mathematics & Estimation
Subtopics	Estimating multi-step results • Checking complex calculations • Justifying an estimate
Concept Description	Students estimate and justify the reasonableness of answers to more complex, multi-step calculations.
Learning Outcomes	Students can estimate the result of a multi-step calculation and justify whether an answer is reasonable.
Skills Developed	Estimation, Reasoning, Communication
Beginner (L1)	Estimate the result of a two-step calculation by rounding.
Intermediate (L2)	Estimate the result of a multi-step calculation involving different operations.
Challenge (L3)	Justify, using estimation, which of several answers is most likely correct.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Mental maths question
Should Be Tested	Estimation and justified reasonableness checks within Class 6 scope
Should NOT Be Tested	Formal significant-figure or error-bound calculations

10. Class 5 → Class 6 Progression Map

This spiral progression map shows, for every domain, how Class 5 foundations develop into Class 6 fluency and reasoning, and what a Challenge-level extension looks like.

Domain	Class 5 Foundation	Class 6 Development	Challenge Extension
Number & Number Sense	Large numbers to 1,000,000; factors/multiples/primes; divisibility rules.	Prime factorization; HCF/LCM; positive/negative numbers; square/cube numbers.	Multi-property number puzzles combining factorization, primes and negatives.
Whole Number Operations	Multi-digit operations; simple order of operations; mental strategies.	Order of operations with brackets; efficient mental strategies for larger numbers.	Multi-step calculations requiring error detection and strategy justification.
Fractions	Equivalent/simplifying; comparing/ordering; addition/subtraction; fraction of a quantity.	Multiplying and dividing fractions; mixed number operations; multi-step word problems.	Multi-step fraction problems combining several operations in unfamiliar contexts.
Decimals	Place value to thousandths; addition/subtraction/multiplication; money word problems.	Decimal multiplication/division; fluency and error-detection reasoning; multi-step problems.	Multi-step decimal reasoning problems requiring estimation and error checking.
Percentages	Meaning of percentage; percentage-fraction-decimal links; percentage of a quantity.	Percentage-decimal-fraction fluency; percentage increase/decrease; multi-step word problems.	Multi-step problems combining percentage change with comparison across scenarios.
Ratio & Proportion	Ratio notation; part-to-part/part-to-whole; simple proportion and scaling.	Simplifying ratios; ratio word problems (sharing); proportional reasoning via unitary method.	Multi-step proportional reasoning problems in unfamiliar real-life contexts.
Patterns & Algebraic Thinking	Arithmetic sequences; introduction to variables/expressions; one-step equations.	Sequence rules; expressions with substitution; two-step equations; introduction to inequality.	Multi-step equations and inequalities requiring verification of solutions.
Geometry	2D shape/angle properties; triangles/quadrilaterals; symmetry/reflection/coordinates (Q1); angle measurement.	Angle relationships; circles (intro); four-quadrant coordinates/transformations; informal geometric reasoning.	Multi-step angle-reasoning diagrams and justified geometric conclusions.
Perimeter, Area & Volume	Perimeter of composite shapes; area of rectangles/triangles; introduction to volume.	Perimeter/area of composite figures; area of triangles/parallelograms; volume and surface area of cuboids.	Multi-step composite-figure problems combining perimeter, area, volume and missing dimensions.
Measurement	Metric unit conversion; measurement estimation and accuracy.	Complex/multi-step unit conversion including area units; multi-step measurement word problems.	Multi-step problems combining conversion with a further calculation in an unfamiliar context.
Time	24-hour time; elapsed time across AM/PM; timelines, calendars and schedules.	Time-zone awareness; multi-step elapsed time across several connected events.	Multi-event scheduling problems combining time zones and elapsed time.
Money & Financial Mathematics	Unit price and best value; percentage discounts and sale prices.	Budgeting and financial reasoning; multi-step money and percentage problems.	Multi-step budgeting/saving problems comparing several financial scenarios.
Data Handling	Frequency tables and scaled graphs; mean and range (introduction).	Mean/range for data comparison; line graphs; multi-step interpretation across data sources.	Multi-step problems combining two data displays with justified conclusions.
Probability & Chance	Everyday probability language; comparing likelihoods.	Probability as a fraction; comparing theoretical and experimental probability.	Comparing probabilities across events and reasoning about experimental results.
Logical Reasoning	Logic/classification puzzles; multi-condition reasoning with clues.	Multi-condition puzzles; arrangement/elimination	Puzzles with five or more interacting conditions

Domain	Class 5 Foundation	Class 6 Development	Challenge Extension
		problems; strategy and non-routine puzzles.	requiring systematic organisation.
Problem Solving	Multi-step real-life problems combining two domains.	Multi-step problems across three or more domains; genuinely non-routine challenges.	Unfamiliar, multi-domain competition-style problems with more than one valid approach.
Mental Mathematics & Estimation	Mental strategies and estimation across whole numbers, fractions, decimals, percentages.	Mental strategies for fractions/decimals/percentages; advanced estimation and justification.	Comparing and justifying the efficiency of different mental strategies for the same problem.

11. MCQ Assessment Blueprint

The following domain-weighting tables give future question writers a recommended percentage distribution for building a balanced Markhor Junior Elementary Level question bank. Fractions carries the strongest single weighting in both classes given its centrality to Elementary Level fluency, while Percentages, Ratio & Proportion and Patterns & Algebraic Thinking grow noticeably from Class 5 to Class 6 as these domains mature. Mental Mathematics & Estimation is intentionally woven throughout other domains as a skill rather than heavily weighted as a standalone category.

Class 5 — Domain Distribution

Mathematical Domain	% of Question Bank
Number & Number Sense	8%
Whole Number Operations	7%
Fractions	12%
Decimals	9%
Percentages	6%
Ratio & Proportion	5%
Patterns & Algebraic Thinking	6%
Geometry	10%
Perimeter, Area & Volume	8%
Measurement	5%
Time	4%
Money & Financial Mathematics	4%
Data Handling	5%
Probability & Chance	2%
Logical Reasoning	4%
Problem Solving	4%
Mental Mathematics & Estimation	1%
Total	100%

Class 6 — Domain Distribution

Mathematical Domain	% of Question Bank
Number & Number Sense	7%
Whole Number Operations	5%
Fractions	12%
Decimals	8%
Percentages	8%
Ratio & Proportion	7%
Patterns & Algebraic Thinking	7%
Geometry	10%
Perimeter, Area & Volume	8%
Measurement	4%
Time	3%
Money & Financial Mathematics	4%
Data Handling	5%
Probability & Chance	3%
Logical Reasoning	4%
Problem Solving	4%
Mental Mathematics & Estimation	1%
Total	100%

12. Difficulty Distribution

Reflecting the Elementary Level's increasing competition difficulty, both classes carry a larger share of Intermediate and Challenge items than the Learner Level, with Class 6 shifting further toward Challenge as students approach pre-secondary reasoning.

Class 5

Difficulty Level	% of Question Bank
Level 1 — Beginner	30%
Level 2 — Intermediate	42%
Level 3 — Challenge	28%

Class 6

Difficulty Level	% of Question Bank
Level 1 — Beginner	24%
Level 2 — Intermediate	41%
Level 3 — Challenge	35%

13. Future Question Bank Tagging System

Every Markhor Junior Elementary Level MCQ should be tagged using the following standardised code, consistent with the Beginner and Learner Level systems and scalable to future classes:

CLASS – DOMAIN – DIFFICULTY – TYPE – SEQUENCE

Example: C6-RP-C-WRD-014 → Class 6, Ratio & Proportion, Challenge, Word problem, item 14.

Class Codes

Code	Meaning
C5	Elementary Level — Class 5
C6	Elementary Level — Class 6

Domain Codes

Code	Meaning
NS	Number & Number Sense
OP	Whole Number Operations
FR	Fractions
DC	Decimals
PC	Percentages
RP	Ratio & Proportion
PA	Patterns & Algebraic Thinking
GE	Geometry
AV	Perimeter, Area & Volume
ME	Measurement
TM	Time
MO	Money & Financial Mathematics
DT	Data Handling
PR	Probability & Chance
LR	Logical Reasoning
PS	Problem Solving
MN	Mental Mathematics & Estimation

Difficulty Codes

Code	Meaning
B	Beginner (Level 1)
I	Intermediate (Level 2)
C	Challenge (Level 3)

Question Type Codes

Code	Meaning
MCQ	Standard multiple-choice question

Code	Meaning
VMCQ	Visual multiple-choice question
PMCQ	Picture-based multiple-choice question
PAT	Pattern question
MSN	Missing number question
LGR	Logical reasoning question
WRD	Word / real-life problem
MSP	Multi-step problem
DIN	Data interpretation question
GEO	Geometry question
FRQ	Fraction question
DEC	Decimal question
RAT	Ratio question
PCT	Percentage question
PRB	Probability question
MSR2	Measurement question
MSR	Mental maths / strategy question
ERR	Error-detection question
CMP	Comparison question

14. Assessment Alignment

This curriculum is structured to directly support every future Markhor Junior assessment product at the Elementary Level:

- Practice Test — reinforces individual topics and targeted skill practice, drawing mainly from Beginner and Intermediate level items.
- Mock Test — provides mixed-topic, timed examination preparation across all seventeen domains, following the recommended MCQ Assessment Blueprint distribution.
- Past Paper — offers contest-style revision and benchmarking, balancing all three difficulty levels as previously used in official Markhor Junior papers.
- Contest Paper — delivers a balanced evaluation of mathematical knowledge, mental mathematics, reasoning and non-routine problem solving, weighted according to the official domain and difficulty distributions in Sections 11 and 12.

15. Master Syllabus Table

A single reference table for teachers, curriculum managers, question writers and AI question-generation systems. Full topic detail (subtopics, concept description, skills, should/should-not boundaries) is provided in the Detailed Topic-by-Topic Curriculum sections above; this table gives a compact, scannable overview.

Class 5

Code	Domain	Topic	Beginner	Intermediate	Challenge	Visual
C5-NS-01	NS	Large Numbers & Place Value	Identify the value of a digit in a 6-digit number.	Compare and order numbers up to one million.	Solve a problem where regrouping across several place values changes the answer.	Low
C5-NS-02	NS	Factors, Multiples & Prime Numbers	List the factors of a number up to 100.	Apply a divisibility rule to check whether a number is a factor.	Classify numbers up to 100 as prime or composite and justify using divisibility rules.	Low
C5-NS-03	NS	Divisibility Rules & Number Properties	Apply a single divisibility rule to a given number.	Combine two divisibility rules to solve a problem.	Solve a puzzle requiring several number-property conditions at once.	Low
C5-OP-04	OP	Multi-Digit Operations & Order of Operations (Introduction)	Evaluate an expression with addition and multiplication in the correct order.	Evaluate an expression with three operations in the correct order.	Identify an error in an incorrectly ordered calculation and correct it.	Low
C5-OP-05	OP	Mental Calculation Strategies	Apply a basic mental strategy to a two-digit calculation.	Apply a mental strategy involving compensation or adjustment.	Choose the most efficient strategy among several for an unfamiliar calculation.	Low
C5-OP-06	OP	Multi-Step Word Problems	Solve a two-step problem with familiar numbers.	Solve a three-step problem within Class 5 number range.	Solve a problem with an unfamiliar or layered context requiring careful planning.	Medium
C5-FR-07	FR	Equivalent & Simplifying Fractions	Identify an equivalent fraction from a given fraction.	Simplify a fraction to lowest terms using a common factor.	Identify which of several fractions is already in lowest terms.	Medium
C5-FR-08	FR	Comparing & Ordering Fractions	Compare two fractions with related denominators.	Compare two fractions with unrelated denominators using a common denominator.	Order a mixed set of fractions, including improper fractions and mixed numbers.	Medium
C5-FR-09	FR	Addition & Subtraction of Fractions	Add or subtract fractions with the same denominator.	Add or subtract fractions with unlike denominators.	Add or subtract mixed numbers, including regrouping across whole numbers.	Medium
C5-FR-10	FR	Fraction of a Quantity & Word Problems	Find a unit fraction of a quantity.	Find a non-unit fraction of a quantity in a word problem.	Solve a multi-step word problem combining fraction of a quantity with another operation.	Medium
C5-DC-11	DC	Decimal Place Value (to Thousandths)	Read a decimal number to two decimal places.	Read and represent a decimal number to three decimal places.	Convert between a fraction and its decimal equivalent to three decimal places.	Medium
C5-DC-12	DC	Decimal Operations (Add/Subtract/Multiply)	Add or subtract two decimals to two decimal places.	Multiply a decimal by a whole number.	Solve a multi-step calculation combining decimal addition, subtraction and multiplication.	Low
C5-DC-13	DC	Decimal Word Problems & Money	Solve a one-step decimal money word problem.	Solve a two-step decimal money word problem.	Solve a multi-step problem combining decimal operations and comparison.	Medium
C5-PC-14	PC	Introduction to Percentages	Identify the percentage shown by a shaded grid of 100 squares.	Convert a simple percentage to a fraction or decimal.	Convert between percentage, fraction and decimal for a less common value.	High
C5-PC-15	PC	Percentage of a Quantity	Find 10% or 50% of a quantity.	Find 25%, 20% or 75% of a quantity.	Solve a word problem requiring a percentage of a quantity in an unfamiliar context.	Medium

Code	Domain	Topic	Beginner	Intermediate	Challenge	Visual
C5-RP-16	RP	Introduction to Ratio	Write a simple ratio from a picture or description.	Interpret a part-to-whole ratio in a real-life context.	Solve a problem requiring both part-to-part and part-to-whole ratio reasoning.	High
C5-RP-17	RP	Simple Proportion & Scaling	Find an equivalent ratio by scaling both terms by the same factor.	Solve a simple proportion word problem (e.g. recipe scaling).	Solve a multi-step proportion problem involving scaling in an unfamiliar context.	Medium
C5-PA-18	PA	Number Patterns & Sequences	Extend a simple arithmetic sequence by one or two terms.	Describe the rule of an arithmetic sequence in words.	Predict a distant term in a sequence using its rule.	Medium
C5-PA-19	PA	Introduction to Variables & Expressions	Evaluate a simple expression (e.g. $n + 5$) for a given value of n .	Write a simple expression to represent a word description.	Evaluate a two-operation expression for a given value.	Low
C5-PA-20	PA	Simple Equations	Solve a one-step addition or subtraction equation.	Solve a one-step multiplication or division equation.	Solve a simple two-step equation.	Low
C5-GE-21	GE	2D Shape Properties & Angles	Classify a polygon by its number of sides.	Identify the angle types within a given polygon.	Reason informally about the angles in a polygon using known angle facts.	High
C5-GE-22	GE	Triangles & Quadrilaterals	Name a common triangle or quadrilateral type.	Classify a shape using two combined properties (sides and angles).	Identify a shape from a description that could match more than one type.	High
C5-GE-23	GE	Symmetry, Reflection & Coordinates (Introduction)	Identify a line of symmetry in a shape.	Plot a given ordered pair on a coordinate grid (first quadrant).	Reflect a shape across a line on a coordinate grid.	High
C5-GE-24	GE	Angle Measurement & Reasoning	Measure a given angle using a protractor.	Find a missing angle on a straight line using the fact that angles sum to 180° .	Find a missing angle at a point using the fact that angles sum to 360° .	High
C5-AV-25	AV	Perimeter of Composite Shapes	Find the perimeter of a composite shape with all sides given.	Find a missing side length in a composite shape before calculating perimeter.	Solve a real-life problem requiring perimeter of an irregular composite shape.	High
C5-AV-26	AV	Area of Rectangles & Triangles	Calculate the area of a rectangle given its length and width.	Calculate the area of a triangle given its base and height.	Calculate the total area of a composite shape made of a rectangle and a triangle.	High
C5-AV-27	AV	Introduction to Volume	Count the cubic units filling a simple 3D shape shown visually.	Calculate the volume of a rectangular prism using $\text{length} \times \text{width} \times \text{height}$.	Find a missing dimension given the volume of a rectangular prism.	High
C5-ME-28	ME	Unit Conversion & Measurement Problems	Convert between two closely related units (e.g. cm to m).	Convert between units involving decimals (e.g. 1250 g to kg).	Solve a multi-step word problem requiring more than one unit conversion.	Medium
C5-ME-29	ME	Measurement Estimation & Accuracy	Choose the most appropriate unit for measuring a familiar object.	Estimate a measurement using a known reference point.	Judge whether a given measurement estimate is reasonable and explain why.	Medium
C5-TM-30	TM	24-Hour Time & Elapsed Time	Convert a simple 12-hour time to 24-hour notation.	Calculate elapsed time between two 24-hour times.	Solve a multi-step problem involving several activities in 24-hour time.	Medium
C5-TM-31	TM	Timelines, Calendars & Schedules	Read a direct fact from a timetable or calendar.	Find the time between two entries in a schedule.	Solve a multi-step planning problem using a timetable and calendar together.	Medium
C5-MO-32	MO	Money Word Problems & Unit Price	Find the total cost of several items.	Calculate a unit price and compare two options.	Solve a multi-step best-value problem involving different package sizes.	Medium
C5-MO-33	MO	Discounts & Simple Percentage Applications	Find the discount amount for a simple percentage off.	Find the sale price after a percentage discount.	Solve a multi-step problem comparing two different discount offers.	Medium
C5-DT-34	DT	Frequency Tables & Graphs	Complete a simple frequency table from a small data set.	Read a value from a scaled bar graph, including between marked intervals.	Answer a multi-step question combining frequency table and graph data.	High

Code	Domain	Topic	Beginner	Intermediate	Challenge	Visual
C5-DT-35	DT	Mean/Average & Range (Introduction)	Find the range of a small data set.	Find the mean of a small data set (up to 5 values).	Compare two data sets using their mean and range together.	Medium
C5-PR-36	PR	Introduction to Probability	Classify a simple event as certain, impossible, likely or unlikely.	Compare the likelihood of two events using probability language.	Order a set of events from least to most likely with justification.	Medium
C5-LR-37	LR	Logic Puzzles & Classification	Solve a simple classification puzzle.	Solve a puzzle requiring two combined classification rules.	Solve a puzzle requiring several reasoning steps.	Medium
C5-LR-38	LR	Multi-Condition Reasoning Problems	Use two clues to eliminate incorrect options.	Use three or four clues to find the correct answer.	Solve a problem requiring an organised table of several interacting clues.	Medium
C5-PS-39	PS	Multi-Step Real-Life Problems	Solve a two-step problem with familiar numbers.	Solve a three-step problem combining two domains (e.g. fractions and money).	Solve a problem combining three or more domains with an unfamiliar context.	Medium
C5-MN-40	MN	Mental Math & Estimation Strategies	Estimate the result of a two-number calculation by rounding.	Estimate a fraction, decimal or percentage result mentally.	Identify the most reasonable of several answers without calculating exactly.	Low

Class 6

Code	Domain	Topic	Beginner	Intermediate	Challenge	Visual
C6-NS-01	NS	Prime Factorization & HCF/LCM	Find the prime factorization of a number up to 50 using a factor tree.	Find the HCF or LCM of two numbers by listing factors/multiples.	Find the HCF and LCM of two numbers using prime factorization and solve a related word problem.	Medium
C6-NS-02	NS	Positive & Negative Numbers (Introduction)	Place a positive or negative number on a number line.	Compare two numbers where one or both are negative.	Solve a real-life problem involving a rise or fall through zero (e.g. temperature change).	High
C6-NS-03	NS	Number Properties & Reasoning	Identify a square number up to 144.	Identify a cube number up to 125.	Solve a puzzle requiring reasoning about several number properties together (e.g. prime and square).	Low
C6-OP-04	OP	Order of Operations & Multi-Step Calculations	Evaluate an expression with brackets and two operations.	Evaluate an expression with brackets and three or more operations.	Identify and correct an error in an incorrectly evaluated multi-step expression.	Low
C6-OP-05	OP	Efficient Mental Strategies for Larger Numbers	Apply a mental strategy to a calculation involving multiples of 10, 100 or 1000.	Apply a mental strategy combining multiplication and addition/subtraction.	Compare two mental strategies and justify which is more efficient for a given problem.	Low
C6-FR-06	FR	Multiplying Fractions	Multiply a fraction by a whole number.	Multiply two proper fractions.	Solve a multi-step problem requiring fraction multiplication in context.	High
C6-FR-07	FR	Dividing Simple Fractions	Divide a fraction by a whole number.	Divide a whole number by a unit fraction using a visual model.	Solve a word problem requiring simple fraction division.	High
C6-FR-08	FR	Mixed Number Operations	Add two mixed numbers with the same denominator.	Subtract mixed numbers, including regrouping.	Multiply two mixed numbers by first converting to improper fractions.	Medium
C6-FR-09	FR	Multi-Step Fraction Word Problems	Solve a one-step fraction word problem.	Solve a two-step fraction word problem combining two operations.	Solve a multi-step fraction word problem with an unfamiliar or layered context.	Medium
C6-DC-10	DC	Decimal Multiplication & Division	Multiply or divide a decimal by 10 or 100.	Multiply a decimal by a whole number.	Multiply two decimals together and estimate to check the answer's reasonableness.	Low
C6-DC-11	DC	Fluency & Reasoning with Decimals	Solve a two-step calculation combining decimal addition and multiplication.	Identify an error in a decimal calculation and correct it.	Solve a multi-step decimal reasoning problem with an unfamiliar structure.	Low
C6-DC-12	DC	Decimal Word Problems (Multi-Step)	Solve a two-step decimal word problem.	Solve a three-step decimal word problem in a money or measurement context.	Solve a multi-step decimal problem with an unfamiliar or layered context.	Medium
C6-PC-13	PC	Percentage–Decimal–Fraction Connections	Convert a simple percentage to a decimal or fraction.	Convert a less common percentage (e.g. 35%) to a fraction in lowest terms.	Order a mixed set of percentages, decimals and fractions from smallest to largest.	Medium
C6-PC-14	PC	Percentage Increase/Decrease	Calculate a simple percentage increase (e.g. 10%) on a quantity.	Calculate a percentage decrease and find the resulting value.	Solve a multi-step problem involving a percentage increase followed by a decrease (or vice versa).	Medium
C6-PC-15	PC	Percentage Word Problems	Solve a one-step percentage word problem.	Solve a two-step percentage word problem.	Solve a multi-step percentage problem comparing two or more scenarios.	Medium
C6-RP-16	RP	Equivalent Ratios & Simplifying	Simplify a simple two-term ratio.	Find an equivalent ratio by scaling both terms.	Simplify a ratio involving three terms or larger numbers.	Medium

Code	Domain	Topic	Beginner	Intermediate	Challenge	Visual
C6-RP-17	RP	Ratio Word Problems	Share a quantity between two parts in a simple ratio.	Share a quantity between three parts in a given ratio.	Solve a multi-step ratio word problem combining sharing with another operation.	Medium
C6-RP-18	RP	Proportional Reasoning & Scaling	Scale a quantity up or down by a whole-number factor.	Use the unitary method to find the value of one unit, then scale.	Solve a multi-step proportion problem in an unfamiliar real-life context.	Medium
C6-PA-19	PA	Arithmetic Sequences & Rules	Extend an arithmetic sequence by several terms.	Describe the rule of a sequence in words and use it to find a nearby term.	Find a term far along a sequence using its rule without listing every term.	Medium
C6-PA-20	PA	Expressions & Substitution	Substitute a value into a one-operation expression.	Write an expression from a word description and substitute a value.	Simplify a simple expression by combining like terms before substituting.	Low
C6-PA-21	PA	Solving Equations (Multi-Step)	Solve a one-step equation.	Solve a two-step equation involving two different operations.	Solve a two-step equation and verify the solution by substitution.	Low
C6-PA-22	PA	Inequality (Introduction)	Identify whether a given value satisfies a simple inequality.	Represent a simple inequality (e.g. $x > 5$) on a number line.	Find all whole-number values that satisfy a given inequality within a range.	Medium
C6-GE-23	GE	Angle Relationships & Reasoning	Find a missing angle on a straight line or at a point.	Find a missing angle in a triangle using the angle sum of 180° .	Find a missing angle in a multi-step diagram combining several angle facts.	High
C6-GE-24	GE	Circles (Introductory Properties)	Identify the radius or diameter of a circle from a diagram.	Find the diameter given the radius, or vice versa.	Solve a real-life problem involving the radius or diameter of a circular object.	High
C6-GE-25	GE	Coordinate Geometry & Transformations	Plot a point in the first quadrant.	Plot a point in any of the four quadrants.	Describe the transformation that maps one shape to another on a coordinate grid.	High
C6-GE-26	GE	Shape Composition & Decomposition	Identify the simple shapes that make up a composite figure.	Split a composite figure into simpler shapes to help solve a problem.	Solve a problem requiring an unfamiliar or non-obvious decomposition of a figure.	High
C6-GE-27	GE	Geometric Reasoning (Informal)	State a property that justifies a simple geometric fact.	Explain why a given angle or shape conclusion is true using known properties.	Compare two different valid explanations for the same geometric conclusion.	Medium
C6-AV-28	AV	Perimeter & Area of Composite Figures	Calculate the area of a composite figure with all dimensions given.	Find a missing dimension in a composite figure before calculating area or perimeter.	Solve a real-life problem requiring both perimeter and area of an unfamiliar composite figure.	High
C6-AV-29	AV	Area of Triangles & Parallelograms	Calculate the area of a parallelogram given base and height.	Calculate the area of a triangle given base and height.	Calculate the area of a composite figure combining a triangle and a parallelogram.	High
C6-AV-30	AV	Volume of Cubes & Cuboids	Calculate the volume of a cube given its side length.	Calculate the volume of a cuboid given its three dimensions.	Find a missing dimension of a cuboid given its volume and the other two dimensions.	High
C6-AV-31	AV	Surface Area (Introduction)	Identify the faces of a cuboid from its net.	Calculate the surface area of a cube given its side length.	Calculate the surface area of a cuboid with three different dimensions.	High
C6-ME-32	ME	Complex Unit Conversion	Convert a measurement requiring one conversion step.	Convert a measurement requiring two conversion steps.	Solve a real-life problem requiring conversion plus a further calculation.	Medium
C6-ME-33	ME	Measurement Word Problems (Multi-Step)	Solve a two-step measurement word problem.	Solve a three-step measurement word problem involving conversion.	Solve a measurement problem combining two different measurement types and a real-life constraint.	Medium
C6-TM-34	TM	Time-Zone Awareness & Real-Life Time Problems	State the time in a second location given a	Solve a simple problem involving a scheduled call	Solve a multi-step problem involving time	Medium

Code	Domain	Topic	Beginner	Intermediate	Challenge	Visual
			whole-number hour difference.	or event across two time zones.	zones and elapsed time together.	
C6-TM-35	TM	Multi-Step Elapsed Time Problems	Find the elapsed time for one event with a clear start and end.	Combine the durations of two or three events to find a total time.	Solve a scheduling problem requiring elapsed time across several events with gaps.	Medium
C6-MO-36	MO	Budgeting & Financial Reasoning	Check whether a budget covers a list of planned expenses.	Allocate a budget across two or three categories to meet given goals.	Solve a multi-step budgeting problem involving saving toward more than one goal.	Medium
C6-MO-37	MO	Multi-Step Money & Percentage Problems	Solve a two-step problem combining a money total with a simple percentage.	Solve a three-step problem combining discount, total and comparison.	Solve a multi-step problem comparing two different money/percentage scenarios.	Medium
C6-DT-38	DT	Mean, Range & Data Comparison	Find the mean of a data set with up to 6 values.	Find the mean and range of a data set with up to 10 values.	Compare two data sets using mean and range and draw a justified conclusion.	Medium
C6-DT-39	DT	Line Graphs & Scaled Graphs	Read a single value from a line graph.	Describe whether a line graph shows an increasing, decreasing or steady trend.	Answer a multi-step question requiring comparison of two points or sections on a line graph.	High
C6-DT-40	DT	Multi-Step Data Interpretation	Answer a direct question using one data source.	Combine two related pieces of data to answer a question.	Solve a multi-step problem requiring evidence from two different data displays.	Medium
C6-PR-41	PR	Probability Using Fractions	Express the probability of a simple event (e.g. rolling a specific number) as a fraction.	Calculate the probability of an event with more than one favourable outcome.	Compare the probabilities of two different events expressed as fractions.	High
C6-PR-42	PR	Comparing Likelihoods & Experimental Probability	Compare the theoretical probability of two simple events.	Calculate an experimental probability from a small set of trial results.	Compare a theoretical probability with an experimental result and reason about the difference.	Medium
C6-LR-43	LR	Multi-Condition Logic Puzzles	Solve a puzzle using two or three conditions.	Solve a puzzle using four conditions, organised in a table.	Solve a puzzle using five or more interacting conditions.	Medium
C6-LR-44	LR	Arrangement & Elimination Problems	Arrange a small number of items using one constraint.	Arrange items using two or three combined constraints.	Solve an arrangement problem with several interacting constraints and more than one valid strategy.	Medium
C6-LR-45	LR	Strategy & Non-Routine Puzzles	Solve a strategy puzzle with a clear, guided first step.	Solve a strategy puzzle requiring the student to choose their own approach.	Solve a genuinely unfamiliar strategy puzzle and compare it with an alternative approach.	Medium
C6-PS-46	PS	Multi-Step Problems Across Domains	Solve a two-domain problem with familiar numbers (e.g. money and fractions).	Solve a three-step problem combining two or three domains.	Solve a problem combining three or more domains with an unfamiliar context.	Medium
C6-PS-47	PS	Non-Routine Challenge Problems	Solve a non-routine problem with a guided first step.	Solve a non-routine problem combining two or three known concepts.	Solve a genuinely unfamiliar, multi-condition competition-style problem.	Medium
C6-MN-48	MN	Mental Strategies for Fractions, Decimals & Percentages	Recall a common fraction-decimal-percentage equivalence mentally.	Mentally estimate the result of a fraction or percentage calculation.	Choose the most efficient mental approach among fraction, decimal or percentage methods for the same problem.	Low
C6-MN-49	MN	Estimation & Reasonableness (Advanced)	Estimate the result of a two-step calculation by rounding.	Estimate the result of a multi-step calculation involving different operations.	Justify, using estimation, which of several answers is most likely correct.	Low

16. Final Quality Control Summary

This curriculum has been reviewed against the following standards:

- Class 5 is appropriately more advanced than Learner Level Class 3–4, with percentages, ratio & proportion, algebraic thinking and volume introduced as substantial new domains.
- Class 6 is clearly more advanced than Class 5, with no unnecessary repetition.
- The Elementary Level connects naturally with the Learner Level through a consistent spiral progression.
- Arithmetic fluency and mathematical reasoning are balanced throughout; fractions, decimals, percentages and ratios receive appropriate emphasis.
- Algebraic thinking is introduced progressively, from patterns and simple expressions in Class 5 to equations and inequality in Class 6, without becoming a secondary algebra syllabus.
- Geometry and spatial reasoning are sufficiently represented; perimeter, area and volume are properly developed as a dedicated domain.
- Measurement, time, money and data are fully included; probability is introduced appropriately and conceptually.
- Problem solving, mental mathematics and estimation are integrated across domains, not treated as isolated add-ons.
- Challenge-level items are built from hidden relationships, multiple conditions and strategic thinking, not merely larger numbers or advanced concepts outside the syllabus.
- Every topic can generate high-quality MCQs across the seven standard question concepts and has clearly defined testing boundaries.
- Learning outcomes are measurable and question-bank ready.
- The curriculum supports future Practice Tests, Mock Tests, Past Papers and Contest Papers, and is scalable to future Markhor Junior levels.
- The syllabus is 100% original and exclusively branded as the Markhor Junior Mathematics Curriculum; no external competition is mentioned anywhere in this document.
- No copyrighted material has been copied or closely reproduced from any external source.