

MARKHOR JUNIOR MATHEMATICS CURRICULUM

Learner Level — Class 3 & Class 4

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 — Learner Level (Class 3 & Class 4) is an original, internationally-benchmarked mathematics framework designed exclusively for the Markhor Junior Contest. It builds directly on the Beginner Level (Class 1 & Class 2) and develops mathematical fluency, deeper reasoning and genuine problem-solving ability, without referencing, naming or basing itself on any specific external competition or syllabus.

The Learner Level follows the progression: Understand → Apply → Analyze → Reason → Solve. Students move beyond direct calculation toward interpreting unfamiliar situations, recognising mathematical relationships and applying strategic, non-routine thinking — always built from concepts genuinely within the Class 3 and Class 4 syllabus.

This document is the official foundation for all future Markhor Junior Learner Level materials, including MCQ question banks, practice tests, mock tests, past papers and contest papers for Class 3 and Class 4.

2. Curriculum Architecture

The curriculum follows a consistent architecture for every topic:

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

Fourteen mathematical domains are used consistently across both classes, extending the Beginner Level structure and allowing the curriculum to scale cleanly into future Markhor Junior levels:

- Number & Number Sense (NS)
- Addition & Subtraction (AS)
- Multiplication & Division (MD)
- Fractions (FR)
- Decimals (DC)
- Patterns & Algebraic Thinking (PA)
- Geometry & Spatial Reasoning (GE)
- Measurement (ME)
- Time (TM)
- Money (MO)
- Data Handling (DT)
- 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 and non-routine application — never simply through larger numbers or concepts outside the syllabus.

- Level 1 — Beginner: direct understanding and application of a concept.
- Level 2 — Intermediate: application in unfamiliar situations and multi-step reasoning.
- Level 3 — Challenge: competition-oriented, non-routine mathematical thinking, requiring hidden relationships, multiple conditions or strategic problem solving.

4. Spiral Curriculum & Connection to Beginner Level

The Learner Level connects naturally with the Beginner Level: Class 3 extends the number range, arithmetic fluency and reasoning skills established in Class 1–2, while introducing fractions, decimals and perimeter/area as substantial new domains. Class 4 then deepens every domain further — larger numbers, more complex fractions and decimals, angle and shape reasoning, and genuinely non-routine problem solving — without unnecessary repetition. 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:

- Multiplication $\leftrightarrow$ Division (inverse operations and fact families)
- Factors $\leftrightarrow$ Multiples (shared reasoning about number relationships)
- Fractions $\leftrightarrow$ Decimals $\leftrightarrow$ Money (equivalent representations of parts of a whole)
- Multiplication $\leftrightarrow$ Area (the area of a rectangle as a multiplication fact)
- Addition $\leftrightarrow$ Data Handling (totals and differences from a data set)
- Measurement $\leftrightarrow$ Geometry (perimeter and area as measurement applications of shape)
- Patterns $\leftrightarrow$ Early Algebraic Thinking (rules, function machines and simple equations)
- Number Lines $\leftrightarrow$ Fractions/Decimals (shared visual representation)

6. Standard Question Concept Levels

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

7. 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 · Shape reasoning
- Measurement question · Fraction question · Comparison question · Mental maths question · Matching

8. Curriculum Boundary

The Learner Level is deliberately bounded to deepen understanding of age-appropriate mathematics rather than introduce premature advanced content. Concepts explicitly kept outside this syllabus include: long division with 2-digit divisors, formal algebraic notation and multi-variable equations, negative numbers, decimal multiplication/division, area or perimeter of curved shapes, formal angle measurement in degrees using instruments, prime factorisation and formal HCF/LCM algorithms, and any statistics beyond simple totals, differences and comparisons. These remain appropriate targets for future Markhor Junior levels.

Markhor Junior Mathematics — Learner Level — Class 3

Course Overview

Markhor Junior Mathematics — Learner Level — Class 3 develops the fluency, reasoning and problem-solving skills built in the Beginner Level. Students extend their number range to 10,000, build genuine multiplication and division fluency, and are formally introduced to fractions, decimals, perimeter and area as substantial new domains. Every topic balances calculation fluency with visual understanding and reasoning, preparing students to apply mathematics confidently to real-life and non-routine problems as they progress into Class 4.

Mathematical Domains & Topics

Number & Number Sense

- Numbers up to 10,000 & Place Value
- Expanded Form & Standard Form
- Comparing & Ordering Numbers (4-digit)
- Factors and Multiples (Introduction)

Addition & Subtraction

- Multi-Digit Addition with Regrouping
- Multi-Digit Subtraction with Regrouping
- Estimation & Mental Strategies (Add/Sub)

Multiplication & Division

- Multiplication Facts & Arrays (up to 10×10)
- Multi-Digit Multiplication ($2\text{-digit} \times 1\text{-digit}$)
- Division with and without Remainders
- Multiplication–Division Word Problems

Fractions

- Understanding Fractions (Unit & Proper Fractions)
- Equivalent Fractions
- Comparing & Ordering Fractions

Decimals

- Introduction to Decimals (Tenths)
- Decimals and Money Connection

Patterns & Algebraic Thinking

- Number Patterns & Growing Patterns
- Missing Values & Simple Equations

Geometry & Spatial Reasoning

- 2D Shape Properties & Angles (Introduction)
- Lines: Parallel & Perpendicular
- Perimeter of Shapes
- Area of Rectangles (Counting Squares)

Measurement

- Length, Weight & Capacity (Standard Units)
- Temperature

Time

- Reading Time to the Minute
- Elapsed Time & Calendars

Money

- Money Calculations & Word Problems
- Making Change & Simple Budgeting

Data Handling

- Bar Graphs & Tables
- Interpreting & Comparing Data Sets

Logical Reasoning

- Number & Logic Puzzles
- Deductive Reasoning Problems

Problem Solving

- Multi-Step Word Problems
- Non-Routine Problem Solving

Mental Mathematics & Estimation

- Mental Math Strategies
- Estimation & Reasonableness of Answers

Detailed Topic-by-Topic Curriculum — Class 3

Domain: Number & Number Sense

1. Numbers up to 10,000 & Place Value

Topic Code	C3-NS-01
Domain	Number & Number Sense
Subtopics	Thousands, hundreds, tens, ones • Reading/writing 4-digit numbers • Place-value charts
Concept Description	Students read, write and represent numbers up to 10,000 using place value.
Learning Outcomes	Students can identify the value of each digit in a 4-digit number.
Skills Developed	Place-value reasoning, Number sense, Representation
Beginner (L1)	Identify the value of a digit in a 3-digit number.
Intermediate (L2)	Identify the value of a digit in a 4-digit number.
Challenge (L3)	Solve a problem where regrouping across thousands changes the answer.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Number-based MCQ, Missing number
Should Be Tested	Place value up to 10,000
Should NOT Be Tested	Numbers beyond 10,000

2. Expanded Form & Standard Form

Topic Code	C3-NS-02
Domain	Number & Number Sense
Subtopics	Expanded form • Standard form • Converting between forms
Concept Description	Students convert numbers between standard and expanded (place-value) form.
Learning Outcomes	Students can write a number in expanded form and recombine it into standard form.
Skills Developed	Place-value reasoning, Representation, Number sense
Beginner (L1)	Write a 3-digit number in expanded form.
Intermediate (L2)	Write a 4-digit number in expanded form and back.
Challenge (L3)	Identify an incorrectly expanded number and correct it.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Representation question
Should Be Tested	Expanded/standard form up to 10,000
Should NOT Be Tested	Numbers beyond 10,000

3. Comparing & Ordering Numbers (4-digit)

Topic Code	C3-NS-03
Domain	Number & Number Sense

Subtopics	Comparing 4-digit numbers • Ordering sets of numbers • Greatest/smallest
Concept Description	Students compare and order numbers up to 10,000 using place value.
Learning Outcomes	Students can order a set of 4-digit numbers correctly.
Skills Developed	Comparison, Ordering, Place-value reasoning
Beginner (L1)	Compare two 4-digit numbers.
Intermediate (L2)	Order four or more 4-digit numbers.
Challenge (L3)	Find a missing digit that satisfies a comparison rule.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Comparison question
Should Be Tested	Comparing/ordering numbers up to 10,000
Should NOT Be Tested	Numbers beyond 10,000

4. Factors and Multiples (Introduction)

Topic Code	C3-NS-04
Domain	Number & Number Sense
Subtopics	Finding factors • Finding multiples • Common multiples (simple)
Concept Description	Students find factors and multiples of numbers within known multiplication facts.
Learning Outcomes	Students can list the factors or the first few multiples of a given number.
Skills Developed	Multiplicative reasoning, Number relationships, Reasoning
Beginner (L1)	List the first few multiples of a small number.
Intermediate (L2)	Find all factors of a two-digit number.
Challenge (L3)	Find a number that satisfies two factor/multiple conditions at once.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Missing number
Should Be Tested	Factors/multiples within known times tables (up to 10x10)
Should NOT Be Tested	Prime factorisation; LCM/HCF by formal method

Domain: Addition & Subtraction

1. Multi-Digit Addition with Regrouping

Topic Code	C3-AS-01
Domain	Addition & Subtraction
Subtopics	3-digit and 4-digit addition • Regrouping across place values • Column addition
Concept Description	Students add numbers up to 4 digits, including problems with multiple regroupings.
Learning Outcomes	Students can add multi-digit numbers accurately with regrouping.
Skills Developed	Addition fluency, Regrouping, Place-value reasoning
Beginner (L1)	Add two 3-digit numbers with one regrouping step.

Intermediate (L2)	Add two 4-digit numbers with multiple regroupings.
Challenge (L3)	Add three numbers with several regrouping steps and verify reasonableness.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Missing number
Should Be Tested	Addition of numbers up to 10,000
Should NOT Be Tested	Addition beyond 10,000

2. Multi-Digit Subtraction with Regrouping

Topic Code	C3-AS-02
Domain	Addition & Subtraction
Subtopics	3-digit and 4-digit subtraction • Regrouping across zeros • Column subtraction
Concept Description	Students subtract numbers up to 4 digits, including regrouping across zeros.
Learning Outcomes	Students can subtract multi-digit numbers accurately, including across zeros.
Skills Developed	Subtraction fluency, Regrouping, Place-value reasoning
Beginner (L1)	Subtract two 3-digit numbers with one regrouping step.
Intermediate (L2)	Subtract two 4-digit numbers with multiple regroupings.
Challenge (L3)	Subtract across zeros (e.g. $4000 - 1856$) and verify the result.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Missing number
Should Be Tested	Subtraction of numbers up to 10,000
Should NOT Be Tested	Subtraction beyond 10,000

3. Estimation & Mental Strategies (Add/Sub)

Topic Code	C3-AS-03
Domain	Addition & Subtraction
Subtopics	Rounding before calculating • Compensation • Checking reasonableness
Concept Description	Students estimate sums and differences and use mental strategies for efficient calculation.
Learning Outcomes	Students can estimate an answer and judge whether an exact answer is reasonable.
Skills Developed	Estimation, Mental maths, Number sense
Beginner (L1)	Round two numbers before estimating a sum.
Intermediate (L2)	Use a mental strategy to add/subtract without written working.
Challenge (L3)	Decide whether a given answer is reasonable without calculating exactly.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Mental maths question
Should Be Tested	Estimation and mental strategies within 10,000
Should NOT Be Tested	Formal written algorithms tested as mental maths

Domain: Multiplication & Division

1. Multiplication Facts & Arrays (up to 10×10)

Topic Code	C3-MD-01
Domain	Multiplication & Division
Subtopics	Times tables to 10 • Arrays and area models • Fact fluency
Concept Description	Students recall multiplication facts up to 10×10 and represent them using arrays.
Learning Outcomes	Students can recall and apply multiplication facts up to 10×10 fluently.
Skills Developed	Multiplication fluency, Visual reasoning, Mental maths
Beginner (L1)	Recall facts for the 2, 5 and 10 times tables.
Intermediate (L2)	Recall facts for all times tables up to 10.
Challenge (L3)	Solve a puzzle requiring several multiplication facts and reasoning.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Visual MCQ, Missing number
Should Be Tested	Multiplication facts up to 10×10
Should NOT Be Tested	Multiplication facts beyond 10×10

2. Multi-Digit Multiplication (2-digit $\times$ 1-digit)

Topic Code	C3-MD-02
Domain	Multiplication & Division
Subtopics	Multiplying without regrouping • Multiplying with regrouping • Area model
Concept Description	Students multiply a 2-digit number by a 1-digit number, including regrouping.
Learning Outcomes	Students can multiply a 2-digit number by a 1-digit number accurately.
Skills Developed	Multiplication fluency, Regrouping, Place-value reasoning
Beginner (L1)	Multiply a 2-digit number by a 1-digit number without regrouping.
Intermediate (L2)	Multiply a 2-digit number by a 1-digit number with regrouping.
Challenge (L3)	Solve a multi-step problem involving 2-digit by 1-digit multiplication.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Missing number
Should Be Tested	2-digit $\times$ 1-digit multiplication
Should NOT Be Tested	Multi-digit $\times$ multi-digit multiplication

3. Division with and without Remainders

Topic Code	C3-MD-03
Domain	Multiplication & Division
Subtopics	Sharing and grouping • Division facts • Interpreting remainders
Concept Description	Students divide within known facts and interpret remainders in context.

Learning Outcomes	Students can solve a division problem and correctly interpret any remainder.
Skills Developed	Division fluency, Reasoning, Interpretation
Beginner (L1)	Solve a division fact within known times tables.
Intermediate (L2)	Solve a division problem with a remainder.
Challenge (L3)	Decide how to interpret a remainder in a real-life context (round up/down).
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Word problem
Should Be Tested	Division within known facts, simple remainders
Should NOT Be Tested	Long division with multi-digit divisors

4. Multiplication–Division Word Problems

Topic Code	C3-MD-04
Domain	Multiplication & Division
Subtopics	Real-life grouping/sharing stories • Choosing the operation • Multi-step problems
Concept Description	Students apply multiplication and division to solve real-life word problems.
Learning Outcomes	Students can choose the correct operation and solve a multiplication/division word problem.
Skills Developed	Problem solving, Application, Reasoning
Beginner (L1)	Solve a one-step multiplication or division story problem.
Intermediate (L2)	Solve a two-step story problem combining multiplication/division.
Challenge (L3)	Solve a story problem combining multiplication/division with addition/subtraction.
Visual Priority	Medium
Recommended Question Types	Word problem, Multi-step problem
Should Be Tested	One and two-step word problems
Should NOT Be Tested	Problems requiring long division

Domain: Fractions

1. Understanding Fractions (Unit & Proper Fractions)

Topic Code	C3-FR-01
Domain	Fractions
Subtopics	Unit fractions • Proper fractions • Fractions as parts of a whole
Concept Description	Students understand a fraction as equal parts of a whole and represent it visually.
Learning Outcomes	Students can identify and represent unit and proper fractions correctly.
Skills Developed	Fraction sense, Visual reasoning, Representation
Beginner (L1)	Identify a unit fraction shown visually.
Intermediate (L2)	Identify a proper fraction shown visually or numerically.
Challenge (L3)	Identify an incorrect visual representation of a given fraction.

Visual Priority	High
Recommended Question Types	Picture-based MCQ, Visual MCQ
Should Be Tested	Unit and proper fractions with denominators up to 12
Should NOT Be Tested	Improper fractions; Mixed numbers

2. Equivalent Fractions

Topic Code	C3-FR-02
Domain	Fractions
Subtopics	Finding equivalent fractions • Simplifying (visual) • Fraction walls/number lines
Concept Description	Students find equivalent fractions using visual models and simple number relationships.
Learning Outcomes	Students can identify or generate an equivalent fraction for a given fraction.
Skills Developed	Fraction reasoning, Visual reasoning, Number relationships
Beginner (L1)	Identify two visually equivalent fractions.
Intermediate (L2)	Generate an equivalent fraction by multiplying numerator and denominator.
Challenge (L3)	Identify which of several fractions is NOT equivalent to a given fraction.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Standard MCQ
Should Be Tested	Equivalent fractions with denominators up to 12
Should NOT Be Tested	Formal simplifying using HCF

3. Comparing & Ordering Fractions

Topic Code	C3-FR-03
Domain	Fractions
Subtopics	Comparing like denominators • Comparing using fraction walls • Ordering simple fractions
Concept Description	Students compare and order fractions, primarily with the same or related denominators.
Learning Outcomes	Students can compare two fractions and order a small set correctly.
Skills Developed	Comparison, Fraction sense, Visual reasoning
Beginner (L1)	Compare two fractions with the same denominator.
Intermediate (L2)	Compare two fractions with related denominators (e.g. quarters and eighths).
Challenge (L3)	Order a mixed set of simple fractions from smallest to largest.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Comparison question
Should Be Tested	Comparing fractions with denominators up to 12
Should NOT Be Tested	Comparing fractions with unrelated large denominators

Domain: Decimals

1. Introduction to Decimals (Tenths)

Topic Code	C3-DC-01
Domain	Decimals
Subtopics	Decimal notation • Tenths on a number line • Reading simple decimals
Concept Description	Students read, write and represent decimals to one decimal place (tenths).
Learning Outcomes	Students can read and represent a decimal number to one decimal place.
Skills Developed	Decimal sense, Place-value reasoning, Representation
Beginner (L1)	Read a decimal number to one decimal place.
Intermediate (L2)	Place a decimal (tenths) on a number line.
Challenge (L3)	Compare a fraction and a decimal representing the same value.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Standard MCQ
Should Be Tested	Decimals to one decimal place (tenths)
Should NOT Be Tested	Hundredths or thousandths

2. Decimals and Money Connection

Topic Code	C3-DC-02
Domain	Decimals
Subtopics	Money as decimals • Reading prices • Simple decimal addition in money contexts
Concept Description	Students connect decimal notation to money contexts using tenths.
Learning Outcomes	Students can read and compare simple money amounts written as decimals.
Skills Developed	Decimal sense, Real-life application, Number sense
Beginner (L1)	Read a simple price written with one decimal place.
Intermediate (L2)	Compare two prices written as decimals.
Challenge (L3)	Solve a simple money word problem using one-decimal-place amounts.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Word problem
Should Be Tested	Decimal money amounts to one decimal place
Should NOT Be Tested	Multi-step decimal money calculations

Domain: Patterns & Algebraic Thinking

1. Number Patterns & Growing Patterns

Topic Code	C3-PA-01
Domain	Patterns & Algebraic Thinking
Subtopics	Growing number patterns • Describing the rule • Extending patterns
Concept Description	Students identify, describe and extend growing number patterns.

Learning Outcomes	Students can extend a growing pattern and describe its rule in words.
Skills Developed	Pattern recognition, Early algebraic thinking, Reasoning
Beginner (L1)	Extend a simple growing pattern by one or two steps.
Intermediate (L2)	Describe the rule of a growing pattern in words.
Challenge (L3)	Predict a distant term in a growing pattern using the rule.
Visual Priority	Medium
Recommended Question Types	Pattern question, Standard MCQ
Should Be Tested	Growing patterns within numbers up to 10,000
Should NOT Be Tested	Formal algebraic notation for rules

2. Missing Values & Simple Equations

Topic Code	C3-PA-02
Domain	Patterns & Algebraic Thinking
Subtopics	Missing values in equations • Balancing both sides • True/false statements
Concept Description	Students find missing values in simple equations and evaluate whether statements are true.
Learning Outcomes	Students can find the missing value that makes an equation true.
Skills Developed	Early algebraic thinking, Reasoning, Inverse operations
Beginner (L1)	Find a missing value in a one-step equation.
Intermediate (L2)	Balance an equation with operations on both sides.
Challenge (L3)	Solve a two-step missing-value problem.
Visual Priority	Low
Recommended Question Types	Missing number, Standard MCQ
Should Be Tested	Missing values using a symbol or blank, numbers within 10,000
Should NOT Be Tested	Formal algebraic letters and multi-variable equations

Domain: Geometry & Spatial Reasoning

1. 2D Shape Properties & Angles (Introduction)

Topic Code	C3-GE-01
Domain	Geometry & Spatial Reasoning
Subtopics	Polygon properties • Right angles • Comparing angles (bigger/smaller)
Concept Description	Students describe 2D shapes by their properties and identify right angles informally.
Learning Outcomes	Students can classify a shape by its sides/angles and identify a right angle.
Skills Developed	Shape reasoning, Classification, Visual reasoning
Beginner (L1)	Identify a right angle in a shape or picture.
Intermediate (L2)	Classify a shape by counting sides and identifying angle types informally.
Challenge (L3)	Identify a shape from a description combining sides and angle properties.

Visual Priority	High
Recommended Question Types	Picture-based MCQ, Shape reasoning
Should Be Tested	Polygon properties, informal right/acute/obtuse recognition
Should NOT Be Tested	Angle measurement in degrees with a protractor

2. Lines: Parallel & Perpendicular

Topic Code	C3-GE-02
Domain	Geometry & Spatial Reasoning
Subtopics	Parallel lines • Perpendicular lines • Identifying in shapes and real life
Concept Description	Students identify parallel and perpendicular lines in shapes and everyday objects.
Learning Outcomes	Students can identify parallel or perpendicular lines in a shape or picture.
Skills Developed	Visual reasoning, Spatial reasoning, Classification
Beginner (L1)	Identify a pair of parallel lines in a picture.
Intermediate (L2)	Identify a pair of perpendicular lines in a shape.
Challenge (L3)	Identify all parallel/perpendicular pairs in a complex figure.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Visual reasoning
Should Be Tested	Identifying parallel/perpendicular lines visually
Should NOT Be Tested	Formal proofs involving lines

3. Perimeter of Shapes

Topic Code	C3-GE-03
Domain	Geometry & Spatial Reasoning
Subtopics	Meaning of perimeter • Measuring perimeter • Calculating perimeter of rectangles/squares
Concept Description	Students understand perimeter as the distance around a shape and calculate it for simple shapes.
Learning Outcomes	Students can calculate the perimeter of a rectangle, square or simple polygon.
Skills Developed	Measurement reasoning, Addition application, Spatial reasoning
Beginner (L1)	Find the perimeter of a shape by adding given side lengths.
Intermediate (L2)	Calculate the perimeter of a rectangle or square using its dimensions.
Challenge (L3)	Find a missing side length given the perimeter of a shape.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Word problem
Should Be Tested	Perimeter of rectangles, squares and simple polygons
Should NOT Be Tested	Perimeter of circles or curved shapes

4. Area of Rectangles (Counting Squares)

Topic Code	C3-GE-04
Domain	Geometry & Spatial Reasoning
Subtopics	Meaning of area • Counting square units • Area of rectangles by counting
Concept Description	Students understand area as the space covered by a shape, found by counting unit squares.
Learning Outcomes	Students can find the area of a rectangle by counting square units.
Skills Developed	Spatial reasoning, Measurement reasoning, Visual reasoning
Beginner (L1)	Count the square units covering a simple grid shape.
Intermediate (L2)	Find the area of a rectangle shown on a grid.
Challenge (L3)	Compare the areas of two irregular grid shapes.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Visual reasoning
Should Be Tested	Area by counting unit squares on a grid
Should NOT Be Tested	Area formula (length $\times$ width) calculations

Domain: Measurement

1. Length, Weight & Capacity (Standard Units)

Topic Code	C3-ME-01
Domain	Measurement
Subtopics	cm/m, g/kg, ml/l • Reading instruments • Simple conversions
Concept Description	Students measure and compare length, weight and capacity using standard units, with simple conversions.
Learning Outcomes	Students can read a measuring instrument and convert between simple related units.
Skills Developed	Measurement, Unit sense, Conversion reasoning
Beginner (L1)	Read a length, weight or capacity from a simple instrument.
Intermediate (L2)	Convert between simple units (e.g. cm to m, g to kg) using round numbers.
Challenge (L3)	Solve a word problem requiring a unit conversion and calculation.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Word problem
Should Be Tested	Standard units and simple conversions (whole-number factors)
Should NOT Be Tested	Complex multi-step conversions

2. Temperature

Topic Code	C3-ME-02
Domain	Measurement
Subtopics	Reading a thermometer • Comparing temperatures • Real-life temperature contexts

Concept Description	Students read and compare temperatures using a thermometer scale.
Learning Outcomes	Students can read a temperature from a thermometer and compare two temperatures.
Skills Developed	Measurement reading, Comparison, Real-life application
Beginner (L1)	Read a temperature shown on a simple thermometer diagram.
Intermediate (L2)	Compare two given temperatures.
Challenge (L3)	Solve a word problem involving a rise or fall in temperature.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Word problem
Should Be Tested	Reading and comparing temperatures in degrees Celsius
Should NOT Be Tested	Negative temperature calculations

Domain: Time

1. Reading Time to the Minute

Topic Code	C3-TM-01
Domain	Time
Subtopics	Analogue clocks to the minute • Digital time • Matching times
Concept Description	Students read analogue and digital clocks to the nearest minute.
Learning Outcomes	Students can read and match a time shown to the minute on analogue and digital clocks.
Skills Developed	Clock reading, Visual reasoning, Time sense
Beginner (L1)	Read a clock showing a time to the nearest 5 minutes.
Intermediate (L2)	Read a clock showing a time to the exact minute.
Challenge (L3)	Match an unusual analogue time to its correct digital equivalent.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Matching
Should Be Tested	Time to the minute, analogue and digital
Should NOT Be Tested	24-hour time notation

2. Elapsed Time & Calendars

Topic Code	C3-TM-02
Domain	Time
Subtopics	Finding elapsed time • Start/end time problems • Calendar-based problems
Concept Description	Students calculate elapsed time between two given times and solve calendar-based problems.
Learning Outcomes	Students can find the duration between two times or dates.
Skills Developed	Time reasoning, Problem solving, Sequencing
Beginner (L1)	Find the elapsed time between two o'clock times.
Intermediate (L2)	Find the elapsed time between two times to the minute.

Challenge (L3)	Solve a multi-step problem involving start time, duration and a calendar date.
Visual Priority	Medium
Recommended Question Types	Word problem, Standard MCQ
Should Be Tested	Elapsed time within a single day; simple calendar problems
Should NOT Be Tested	Elapsed time calculations spanning months

Domain: Money

1. Money Calculations & Word Problems

Topic Code	C3-MO-01
Domain	Money
Subtopics	Adding/subtracting money • Multi-item totals • Real-life shopping problems
Concept Description	Students add and subtract money amounts to solve real-life shopping word problems.
Learning Outcomes	Students can calculate a total or difference in a money word problem.
Skills Developed	Problem solving, Application, Number sense
Beginner (L1)	Add the cost of two items.
Intermediate (L2)	Find the total cost of several items and the change from a round amount.
Challenge (L3)	Solve a multi-step money word problem with more than two items.
Visual Priority	Medium
Recommended Question Types	Word problem, Standard MCQ
Should Be Tested	Money word problems within realistic amounts
Should NOT Be Tested	Problems involving interest or percentages

2. Making Change & Simple Budgeting

Topic Code	C3-MO-02
Domain	Money
Subtopics	Finding change • Comparing costs to a budget • Simple saving/spending scenarios
Concept Description	Students find change from a purchase and reason about simple age-appropriate budgeting scenarios.
Learning Outcomes	Students can find change from a purchase and decide if a budget is sufficient.
Skills Developed	Problem solving, Real-life reasoning, Number sense
Beginner (L1)	Find change from a round amount after one purchase.
Intermediate (L2)	Decide whether a given budget is enough for several items.
Challenge (L3)	Plan a set of purchases that fits within a given budget.
Visual Priority	Medium
Recommended Question Types	Word problem, Standard MCQ
Should Be Tested	Simple budgeting scenarios within realistic amounts

Should NOT Be Tested	Formal financial concepts (interest, loans)
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Domain: Data Handling

1. Bar Graphs & Tables

Topic Code	C3-DT-01
Domain	Data Handling
Subtopics	Reading bar graphs with scales • Reading tables • Creating simple totals
Concept Description	Students read and interpret bar graphs with numeric scales and simple data tables.
Learning Outcomes	Students can read a value from a bar graph or table accurately.
Skills Developed	Data reading, Visual reasoning, Interpretation
Beginner (L1)	Read a single value from a bar graph or table.
Intermediate (L2)	Compare two or more categories from a bar graph or table.
Challenge (L3)	Answer a two-step question combining several values from a graph or table.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Data interpretation
Should Be Tested	Bar graphs and tables with scales up to 100
Should NOT Be Tested	Graphs requiring interpolation between scale marks

2. Interpreting & Comparing Data Sets

Topic Code	C3-DT-02
Domain	Data Handling
Subtopics	Finding totals and differences • Most/least common • Drawing simple conclusions
Concept Description	Students interpret data sets to find totals, differences and simple conclusions.
Learning Outcomes	Students can find a total, a difference, or draw a simple conclusion from a data set.
Skills Developed	Data interpretation, Reasoning, Comparison
Beginner (L1)	Find the total of two categories in a data set.
Intermediate (L2)	Find the difference between the largest and smallest category.
Challenge (L3)	Draw a conclusion requiring comparison across the whole data set.
Visual Priority	Medium
Recommended Question Types	Data interpretation, Standard MCQ
Should Be Tested	Interpretation of data sets with realistic values
Should NOT Be Tested	Mean, median or advanced statistics

Domain: Logical Reasoning

1. Number & Logic Puzzles

Topic Code	C3-LR-01
Domain	Logical Reasoning
Subtopics	Number grid puzzles • Sum/difference puzzles • Simple logic grids
Concept Description	Students solve puzzles that require logical use of number relationships.
Learning Outcomes	Students can solve a one- or two-step number or logic puzzle.
Skills Developed	Logical reasoning, Number sense, Problem solving
Beginner (L1)	Solve a simple number grid puzzle.
Intermediate (L2)	Solve a puzzle requiring two combined number facts.
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 3 number and operation knowledge
Should NOT Be Tested	Puzzles requiring concepts beyond Class 3 scope

2. Deductive Reasoning Problems

Topic Code	C3-LR-02
Domain	Logical Reasoning
Subtopics	Clue-based puzzles • Elimination reasoning • Simple 'who has what' puzzles
Concept Description	Students use given clues to eliminate possibilities and reach a logical conclusion.
Learning Outcomes	Students can use two or three clues to solve a deduction puzzle.
Skills Developed	Deductive reasoning, Elimination, Logical thinking
Beginner (L1)	Use one or two clues to eliminate options.
Intermediate (L2)	Use three clues to find the correct answer.
Challenge (L3)	Solve a deduction puzzle with four or more interacting clues.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Logical reasoning
Should Be Tested	Clue-based deduction with small option sets
Should NOT Be Tested	Complex multi-variable logic grids

Domain: Problem Solving

1. Multi-Step Word Problems

Topic Code	C3-PS-01
Domain	Problem Solving
Subtopics	Two- and three-step stories • Combined operations • Planning the solution
Concept Description	Students plan and solve word problems requiring two or three connected steps.
Learning Outcomes	Students can plan and solve a multi-step word problem accurately.

Skills Developed	Problem solving, Multi-step reasoning, Planning
Beginner (L1)	Solve a two-step problem with small, familiar numbers.
Intermediate (L2)	Solve a two-step problem within 10,000.
Challenge (L3)	Solve a three-step problem combining several operations.
Visual Priority	Medium
Recommended Question Types	Word problem, Multi-step problem
Should Be Tested	Two- and three-step real-life problems across domains
Should NOT Be Tested	Problems requiring concepts beyond Class 3 scope

2. Non-Routine Problem Solving

Topic Code	C3-PS-02
Domain	Problem Solving
Subtopics	Unfamiliar problem types • Hidden relationships • Competition-style reasoning
Concept Description	Students apply the Understand → Plan → Solve → Check approach to unfamiliar problems.
Learning Outcomes	Students can approach an unfamiliar problem using reasoning rather than a memorised method.
Skills Developed	Non-routine problem solving, Flexible reasoning, Perseverance
Beginner (L1)	Solve a simple non-routine problem with guided structure.
Intermediate (L2)	Solve a non-routine problem combining two known concepts.
Challenge (L3)	Solve a genuinely unfamiliar competition-style problem.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Logical reasoning, Word problem
Should Be Tested	Non-routine problems built from Class 3 concepts only
Should NOT Be Tested	Problems requiring concepts beyond Class 3 scope

Domain: Mental Mathematics & Estimation

1. Mental Math Strategies

Topic Code	C3-MN-01
Domain	Mental Mathematics & Estimation
Subtopics	Mental addition/subtraction • Mental multiplication/division • Strategy selection
Concept Description	Students apply efficient mental strategies to solve calculations without written working.
Learning Outcomes	Students can select and apply an efficient mental strategy for a given calculation.
Skills Developed	Mental maths, Strategy selection, Number sense
Beginner (L1)	Apply a basic mental strategy to a simple fact.
Intermediate (L2)	Apply a mental strategy to a two-step calculation.
Challenge (L3)	Choose the most efficient strategy among several options for an unfamiliar fact.
Visual Priority	Low

Recommended Question Types	Standard MCQ, Mental maths question
Should Be Tested	Mental strategies within Class 3 number range
Should NOT Be Tested	Written algorithms disguised as mental maths

2. Estimation & Reasonableness of Answers

Topic Code	C3-MN-02
Domain	Mental Mathematics & Estimation
Subtopics	Estimating before calculating • Rounding for estimation • Checking reasonableness
Concept Description	Students estimate answers and judge whether a calculated or given answer is reasonable.
Learning Outcomes	Students can estimate an answer and identify whether a given answer is reasonable.
Skills Developed	Estimation, Reasoning, Number sense
Beginner (L1)	Round numbers to estimate a simple sum or product.
Intermediate (L2)	Judge whether a given answer to a calculation is reasonable.
Challenge (L3)	Identify which of several answers is most reasonable without calculating exactly.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Mental maths question
Should Be Tested	Estimation and reasonableness checks within Class 3 scope
Should NOT Be Tested	Formal significant-figure rounding

Markhor Junior Mathematics — Learner Level — Class 4

Course Overview

Markhor Junior Mathematics — Learner Level — Class 4 represents advanced primary mathematics, deeper reasoning and genuine non-routine problem solving. Students work with numbers to 100,000, multi-digit multiplication and long division, equivalent and mixed-number fractions, decimals to hundredths, angle and shape classification, and multi-step real-life problems across every domain. Logical reasoning and non-routine, competition-style thinking are woven throughout, preparing students for confident, independent mathematical reasoning as they progress toward higher Markhor Junior levels.

Mathematical Domains & Topics

Number & Number Sense

- Numbers up to 100,000 & Place Value
- Rounding & Approximation
- Factors, Multiples & Prime Numbers
- Number Relationships & Properties

Addition & Subtraction

- Addition & Subtraction of Larger Numbers
- Multi-Step Addition/Subtraction Word Problems
- Efficient Mental Strategies (Add/Sub)

Multiplication & Division

- Multi-Digit Multiplication (2-digit $\times$ 2-digit)
- Long Division with Remainders
- Factors, Multiples & Multiplication Connections
- Mental Multiplication & Division Strategies
- Multi-Step Multiplication/Division Word Problems

Fractions

- Equivalent Fractions & Simplifying
- Improper Fractions & Mixed Numbers
- Fraction of a Quantity
- Addition & Subtraction of Simple Fractions

Decimals

- Decimals (Tenths & Hundredths)
- Comparing & Ordering Decimals
- Decimal Addition & Subtraction

Patterns & Algebraic Thinking

- Growing & Shrinking Patterns
- Input/Output Patterns & Function Machines
- Solving Simple Equations & Balance Problems

Geometry & Spatial Reasoning

- Angles: Types & Measurement (Introduction)
- 2D Shape Classification & Properties
- 3D Shape Properties (Faces, Edges, Vertices)
- Perimeter of Regular & Irregular Shapes

- Area of Rectangles & Composite Shapes

Measurement

- Unit Conversion (Length, Weight, Capacity)
- Measurement Word Problems
- Temperature & Real-Life Measurement

Time

- 24-Hour Time & AM/PM
- Elapsed Time (Complex Problems)
- Timelines & Calendar Reasoning

Money

- Multi-Step Money Word Problems
- Budgeting & Real-Life Financial Reasoning

Data Handling

- Scaled Bar Graphs & Line Plots
- Data Interpretation & Conclusions

Logical Reasoning

- Multi-Condition Logic Puzzles
- Pattern & Relationship Puzzles
- Elimination & Deduction Problems

Problem Solving

- Multi-Step Real-Life Problems
- Non-Routine Challenge Problems

Mental Mathematics & Estimation

- Mental Math Strategies for Larger Numbers
- Estimation, Approximation & Checking Reasonableness

Detailed Topic-by-Topic Curriculum — Class 4

Domain: Number & Number Sense

1. Numbers up to 100,000 & Place Value

Topic Code	C4-NS-01
Domain	Number & Number Sense
Subtopics	Ten-thousands place • Reading/writing large numbers • Place-value charts
Concept Description	Students read, write and represent numbers up to 100,000 using place value.
Learning Outcomes	Students can identify the value of each digit in a 5-digit number.
Skills Developed	Place-value reasoning, Number sense, Representation
Beginner (L1)	Identify the value of a digit in a 4-digit number.
Intermediate (L2)	Identify the value of a digit in a 5-digit number.
Challenge (L3)	Solve a problem where regrouping across ten-thousands changes the answer.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Number-based MCQ
Should Be Tested	Place value up to 100,000
Should NOT Be Tested	Numbers beyond 100,000

2. Rounding & Approximation

Topic Code	C4-NS-02
Domain	Number & Number Sense
Subtopics	Rounding to 10/100/1000 • Approximating calculations • Real-life rounding contexts
Concept Description	Students round numbers to a given place value and use rounding to approximate calculations.
Learning Outcomes	Students can round a number to the nearest 10, 100 or 1000 and apply it in context.
Skills Developed	Estimation, Place-value reasoning, Reasoning
Beginner (L1)	Round a number to the nearest 10 or 100.
Intermediate (L2)	Round a number to the nearest 1000 in a real-life context.
Challenge (L3)	Find a range of numbers that round to a given value.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Word problem
Should Be Tested	Rounding numbers up to 100,000
Should NOT Be Tested	Rounding decimals

3. Factors, Multiples & Prime Numbers

Topic Code	C4-NS-03
Domain	Number & Number Sense

Subtopics	Factors of numbers to 100 • Common factors • Prime and composite numbers (intro)
Concept Description	Students find factors and multiples of numbers and distinguish prime from composite numbers.
Learning Outcomes	Students can find all factors of a number and classify small numbers as prime or composite.
Skills Developed	Number relationships, Reasoning, Classification
Beginner (L1)	List the factors of a number up to 50.
Intermediate (L2)	Identify common factors of two numbers.
Challenge (L3)	Classify numbers up to 50 as prime or composite and justify the classification.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Missing number
Should Be Tested	Factors/multiples/prime numbers up to 100
Should NOT Be Tested	Prime factorisation using factor trees

4. Number Relationships & Properties

Topic Code	C4-NS-04
Domain	Number & Number Sense
Subtopics	Square numbers (intro) • Number relationships • Properties of operations
Concept Description	Students explore relationships between numbers, including simple square numbers.
Learning Outcomes	Students can identify a square number and describe a simple number relationship.
Skills Developed	Number sense, Pattern recognition, Reasoning
Beginner (L1)	Identify a square number up to 100 (e.g. 25, 36).
Intermediate (L2)	Describe a relationship between a set of numbers.
Challenge (L3)	Solve a puzzle requiring reasoning about number properties.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Logical reasoning
Should Be Tested	Square numbers up to 144; simple number relationships
Should NOT Be Tested	Square roots; Cube numbers

Domain: Addition & Subtraction

1. Addition & Subtraction of Larger Numbers

Topic Code	C4-AS-01
Domain	Addition & Subtraction
Subtopics	5-digit addition/subtraction • Regrouping across multiple place values • Checking answers
Concept Description	Students add and subtract numbers up to 100,000, including complex regrouping.
Learning Outcomes	Students can add and subtract 5-digit numbers accurately.
Skills Developed	Addition/subtraction fluency, Regrouping, Place-value reasoning
Beginner (L1)	Add or subtract two 4-digit numbers with regrouping.

Intermediate (L2)	Add or subtract two 5-digit numbers with multiple regroupings.
Challenge (L3)	Solve a calculation requiring regrouping across several place values, and verify it.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Missing number
Should Be Tested	Addition/subtraction of numbers up to 100,000
Should NOT Be Tested	Numbers beyond 100,000

2. Multi-Step Addition/Subtraction Word Problems

Topic Code	C4-AS-02
Domain	Addition & Subtraction
Subtopics	Two/three-step stories • Real-life planning contexts • Combined operations
Concept Description	Students solve word problems requiring several connected addition/subtraction steps.
Learning Outcomes	Students can plan and solve a multi-step addition/subtraction word problem.
Skills Developed	Problem solving, Multi-step reasoning, Planning
Beginner (L1)	Solve a two-step problem with familiar numbers.
Intermediate (L2)	Solve a two-step problem within 100,000.
Challenge (L3)	Solve a three-step problem with an unfamiliar or layered context.
Visual Priority	Medium
Recommended Question Types	Word problem, Multi-step problem
Should Be Tested	Two- and three-step problems within 100,000
Should NOT Be Tested	Problems requiring concepts beyond Class 4 scope

3. Efficient Mental Strategies (Add/Sub)

Topic Code	C4-AS-03
Domain	Addition & Subtraction
Subtopics	Compensation • Bridging through landmark numbers • Estimating and checking
Concept Description	Students select efficient mental strategies for adding and subtracting larger numbers.
Learning Outcomes	Students can apply an efficient mental strategy to a larger-number calculation.
Skills Developed	Mental maths, Strategy selection, Number sense
Beginner (L1)	Add or subtract a multiple of 100 or 1000 mentally.
Intermediate (L2)	Use compensation to solve a calculation mentally.
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 100,000
Should NOT Be Tested	Written algorithms disguised as mental maths

Domain: Multiplication & Division

1. Multi-Digit Multiplication (2-digit $\times$ 2-digit)

Topic Code	C4-MD-01
Domain	Multiplication & Division
Subtopics	Area model • Partial products • Column multiplication
Concept Description	Students multiply two 2-digit numbers using an area model or column method.
Learning Outcomes	Students can multiply a 2-digit number by a 2-digit number accurately.
Skills Developed	Multiplication fluency, Place-value reasoning, Regrouping
Beginner (L1)	Multiply a 2-digit number by a 1-digit number with regrouping.
Intermediate (L2)	Multiply two 2-digit numbers using an area model.
Challenge (L3)	Solve a multi-step problem involving 2-digit by 2-digit multiplication.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Missing number
Should Be Tested	2-digit $\times$ 2-digit multiplication
Should NOT Be Tested	3-digit $\times$ 2-digit or larger multiplication

2. Long Division with Remainders

Topic Code	C4-MD-02
Domain	Multiplication & Division
Subtopics	Dividing by a 1-digit number • Interpreting remainders • Checking with multiplication
Concept Description	Students divide multi-digit numbers by a 1-digit number, interpreting remainders appropriately.
Learning Outcomes	Students can perform long division by a 1-digit divisor and interpret the remainder.
Skills Developed	Division fluency, Reasoning, Interpretation
Beginner (L1)	Divide a 2-digit number by a 1-digit number with a remainder.
Intermediate (L2)	Divide a 3-digit number by a 1-digit number with a remainder.
Challenge (L3)	Solve a word problem requiring correct interpretation of a remainder.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Word problem
Should Be Tested	Division by a 1-digit divisor, numbers up to 1000
Should NOT Be Tested	Division by a 2-digit divisor

3. Factors, Multiples & Multiplication Connections

Topic Code	C4-MD-03
Domain	Multiplication & Division
Subtopics	Common multiples • Highest common factor (informal) • Multiplication/factor relationships
Concept Description	Students connect multiplication facts to factors, multiples and simple common-factor reasoning.

Learning Outcomes	Students can find common multiples of two numbers or the highest common factor informally.
Skills Developed	Number relationships, Multiplicative reasoning, Reasoning
Beginner (L1)	Find the first few common multiples of two small numbers.
Intermediate (L2)	Find the highest common factor of two numbers up to 50 by listing.
Challenge (L3)	Solve a puzzle requiring both factor and multiple reasoning together.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Missing number
Should Be Tested	Common multiples/factors within known multiplication facts
Should NOT Be Tested	Formal HCF/LCM algorithms

4. Mental Multiplication & Division Strategies

Topic Code	C4-MD-04
Domain	Multiplication & Division
Subtopics	Multiplying/dividing by 10, 100 • Doubling and halving • Using known facts
Concept Description	Students use mental strategies to multiply and divide efficiently, including by 10 and 100.
Learning Outcomes	Students can mentally multiply or divide a number by 10 or 100 and apply doubling/halving.
Skills Developed	Mental maths, Strategy selection, Number sense
Beginner (L1)	Multiply or divide a whole number by 10 mentally.
Intermediate (L2)	Use doubling or halving to solve a multiplication or division fact.
Challenge (L3)	Choose an efficient mental strategy for an unfamiliar multiplication/division fact.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Mental maths question
Should Be Tested	Mental multiplication/division strategies within known facts
Should NOT Be Tested	Written algorithms disguised as mental maths

5. Multi-Step Multiplication/Division Word Problems

Topic Code	C4-MD-05
Domain	Multiplication & Division
Subtopics	Combined operations • Real-life planning contexts • Choosing the right method
Concept Description	Students solve word problems requiring multiplication and/or division across multiple steps.
Learning Outcomes	Students can plan and solve a multi-step multiplication/division word problem.
Skills Developed	Problem solving, Multi-step reasoning, Application
Beginner (L1)	Solve a two-step problem combining multiplication and addition/subtraction.
Intermediate (L2)	Solve a two-step problem combining multiplication and division.
Challenge (L3)	Solve a three-step problem combining several operations.
Visual Priority	Medium

Recommended Question Types	Word problem, Multi-step problem
Should Be Tested	Two- and three-step problems within Class 4 scope
Should NOT Be Tested	Problems requiring concepts beyond Class 4 scope

Domain: Fractions

1. Equivalent Fractions & Simplifying

Topic Code	C4-FR-01
Domain	Fractions
Subtopics	Finding equivalent fractions • Simplifying to lowest terms (visual/informal) • Fraction walls
Concept Description	Students find equivalent fractions and simplify fractions to their lowest terms informally.
Learning Outcomes	Students can simplify a fraction to its lowest terms using a visual or informal method.
Skills Developed	Fraction reasoning, Number relationships, Visual reasoning
Beginner (L1)	Identify an equivalent fraction from a visual model.
Intermediate (L2)	Simplify a fraction to lowest terms informally.
Challenge (L3)	Identify which of several fractions simplifies to a given fraction.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Standard MCQ
Should Be Tested	Equivalent fractions/simplifying with denominators up to 20
Should NOT Be Tested	Formal simplifying using HCF calculations

2. Improper Fractions & Mixed Numbers

Topic Code	C4-FR-02
Domain	Fractions
Subtopics	Improper fractions • Mixed numbers • Converting between forms
Concept Description	Students understand and convert between improper fractions and mixed numbers.
Learning Outcomes	Students can convert an improper fraction to a mixed number and vice versa.
Skills Developed	Fraction reasoning, Visual reasoning, Representation
Beginner (L1)	Identify a mixed number shown visually.
Intermediate (L2)	Convert an improper fraction to a mixed number.
Challenge (L3)	Compare an improper fraction and a mixed number without converting both fully.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Standard MCQ
Should Be Tested	Improper fractions/mixed numbers with denominators up to 12
Should NOT Be Tested	Operations combining improper fractions and mixed numbers

3. Fraction of a Quantity

Topic Code	C4-FR-03
Domain	Fractions
Subtopics	Finding a fraction of a set • Finding a fraction of a number • Real-life fraction problems
Concept Description	Students find a fraction of a quantity or set using division and multiplication.
Learning Outcomes	Students can calculate a unit or non-unit fraction of a given quantity.
Skills Developed	Fraction reasoning, Multiplicative reasoning, Application
Beginner (L1)	Find a unit fraction of a small quantity (e.g. $\frac{1}{4}$ of 20).
Intermediate (L2)	Find a non-unit fraction of a quantity (e.g. $\frac{3}{4}$ of 24).
Challenge (L3)	Solve a word problem requiring a fraction of a quantity in context.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Word problem
Should Be Tested	Fractions of quantities up to 100
Should NOT Be Tested	Fractions of quantities requiring long division

4. Addition & Subtraction of Simple Fractions

Topic Code	C4-FR-04
Domain	Fractions
Subtopics	Same-denominator addition • Same-denominator subtraction • Visual models
Concept Description	Students add and subtract fractions with the same denominator using visual support.
Learning Outcomes	Students can add or subtract two fractions with the same denominator.
Skills Developed	Fraction reasoning, Addition/subtraction fluency, Visual reasoning
Beginner (L1)	Add two fractions with the same denominator, answer less than 1.
Intermediate (L2)	Add or subtract fractions with the same denominator, including results over 1.
Challenge (L3)	Solve a word problem requiring addition/subtraction of same-denominator fractions.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Standard MCQ
Should Be Tested	Same-denominator fraction addition/subtraction, denominators up to 12
Should NOT Be Tested	Addition/subtraction of unlike denominators

Domain: Decimals

1. Decimals (Tenths & Hundredths)

Topic Code	C4-DC-01
Domain	Decimals
Subtopics	Tenths and hundredths • Reading/writing decimals • Decimal place-value charts
Concept Description	Students read, write and represent decimals to two decimal places.

Learning Outcomes	Students can identify the value of each digit in a decimal to hundredths.
Skills Developed	Decimal sense, Place-value reasoning, Representation
Beginner (L1)	Read a decimal number to one decimal place.
Intermediate (L2)	Read and represent a decimal number to two decimal places.
Challenge (L3)	Convert between a fraction (tenths/hundredths) and its decimal equivalent.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Standard MCQ
Should Be Tested	Decimals to two decimal places (hundredths)
Should NOT Be Tested	Decimals beyond hundredths

2. Comparing & Ordering Decimals

Topic Code	C4-DC-02
Domain	Decimals
Subtopics	Comparing decimals • Ordering sets of decimals • Decimal number lines
Concept Description	Students compare and order decimals to two decimal places using place value.
Learning Outcomes	Students can compare two decimals and order a small set correctly.
Skills Developed	Comparison, Decimal sense, Place-value reasoning
Beginner (L1)	Compare two decimals to one decimal place.
Intermediate (L2)	Compare two decimals to two decimal places.
Challenge (L3)	Order a mixed set of decimals with differing numbers of decimal places.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Comparison question
Should Be Tested	Comparing/ordering decimals to two decimal places
Should NOT Be Tested	Decimals beyond hundredths

3. Decimal Addition & Subtraction

Topic Code	C4-DC-03
Domain	Decimals
Subtopics	Adding decimals • Subtracting decimals • Money applications
Concept Description	Students add and subtract decimals to two decimal places, including in money contexts.
Learning Outcomes	Students can add or subtract two decimal numbers accurately.
Skills Developed	Decimal fluency, Place-value reasoning, Application
Beginner (L1)	Add two decimals to one decimal place.
Intermediate (L2)	Add or subtract two decimals to two decimal places.
Challenge (L3)	Solve a multi-step word problem involving decimal addition and subtraction.
Visual Priority	Low

Recommended Question Types	Standard MCQ, Word problem
Should Be Tested	Decimal addition/subtraction to two decimal places
Should NOT Be Tested	Decimal multiplication/division

Domain: Patterns & Algebraic Thinking

1. Growing & Shrinking Patterns

Topic Code	C4-PA-01
Domain	Patterns & Algebraic Thinking
Subtopics	Growing patterns • Shrinking patterns • Describing and extending rules
Concept Description	Students identify, describe and extend both growing and shrinking numerical patterns.
Learning Outcomes	Students can extend a growing or shrinking pattern and describe its rule.
Skills Developed	Pattern recognition, Early algebraic thinking, Reasoning
Beginner (L1)	Extend a simple growing or shrinking pattern.
Intermediate (L2)	Describe the rule of a growing or shrinking pattern.
Challenge (L3)	Predict a distant term in a pattern using its rule.
Visual Priority	Medium
Recommended Question Types	Pattern question, Standard MCQ
Should Be Tested	Growing/shrinking patterns within Class 4 number range
Should NOT Be Tested	Formal algebraic notation for rules

2. Input/Output Patterns & Function Machines

Topic Code	C4-PA-02
Domain	Patterns & Algebraic Thinking
Subtopics	Function machines • Input/output tables • Finding the rule
Concept Description	Students use function machines and input/output tables to identify a mathematical rule.
Learning Outcomes	Students can complete an input/output table and describe the rule connecting them.
Skills Developed	Early algebraic thinking, Pattern recognition, Reasoning
Beginner (L1)	Complete a simple input/output table with a one-step rule.
Intermediate (L2)	Find the rule connecting inputs and outputs in a table.
Challenge (L3)	Find a rule involving two operations from an input/output table.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Missing number
Should Be Tested	Function machines with one or two operations
Should NOT Be Tested	Formal algebraic function notation

3. Solving Simple Equations & Balance Problems

Topic Code	C4-PA-03
Domain	Patterns & Algebraic Thinking
Subtopics	Balancing equations • Missing values with two operations • True/false statements
Concept Description	Students solve simple equations involving one or two operations using balance reasoning.
Learning Outcomes	Students can find an unknown value in an equation involving up to two operations.
Skills Developed	Early algebraic thinking, Inverse operations, Reasoning
Beginner (L1)	Find a missing value in a one-operation equation.
Intermediate (L2)	Find a missing value in a two-operation equation.
Challenge (L3)	Solve an equation where the unknown appears on both sides in a simple form.
Visual Priority	Low
Recommended Question Types	Missing number, Standard MCQ
Should Be Tested	Equations with a symbol or blank, up to two operations
Should NOT Be Tested	Formal algebraic letters and multi-step algebraic manipulation

Domain: Geometry & Spatial Reasoning

1. Angles: Types & Measurement (Introduction)

Topic Code	C4-GE-01
Domain	Geometry & Spatial Reasoning
Subtopics	Acute, right, obtuse angles • Estimating angle size • Introduction to degrees
Concept Description	Students classify angles as acute, right or obtuse and begin estimating angle size in degrees.
Learning Outcomes	Students can classify an angle by type and estimate whether it is more or less than 90° .
Skills Developed	Angle reasoning, Visual reasoning, Classification
Beginner (L1)	Identify whether an angle is a right angle.
Intermediate (L2)	Classify an angle as acute, right or obtuse.
Challenge (L3)	Order a set of angles from smallest to largest by estimation.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Shape reasoning
Should Be Tested	Classifying angles as acute/right/obtuse; estimating size
Should NOT Be Tested	Precise degree measurement with a protractor

2. 2D Shape Classification & Properties

Topic Code	C4-GE-02
Domain	Geometry & Spatial Reasoning
Subtopics	Classifying polygons • Properties of quadrilaterals • Regular vs irregular shapes
Concept Description	Students classify 2D shapes, including different types of quadrilaterals, by their properties.

Learning Outcomes	Students can classify a shape using its sides, angles and symmetry properties.
Skills Developed	Shape reasoning, Classification, Visual reasoning
Beginner (L1)	Name a common quadrilateral (square, rectangle, rhombus, trapezium).
Intermediate (L2)	Classify a shape as regular or irregular.
Challenge (L3)	Identify a shape from a description combining several properties.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Shape reasoning
Should Be Tested	Quadrilateral types and general polygon classification
Should NOT Be Tested	Formal geometric proofs

3. 3D Shape Properties (Faces, Edges, Vertices)

Topic Code	C4-GE-03
Domain	Geometry & Spatial Reasoning
Subtopics	Counting faces/edges/vertices • Prisms and pyramids (intro) • Nets (visual recognition)
Concept Description	Students describe 3D shapes using faces, edges and vertices and recognise simple nets.
Learning Outcomes	Students can count the faces, edges or vertices of a 3D shape and recognise its net.
Skills Developed	Shape reasoning, Spatial visualisation, Classification
Beginner (L1)	Count the faces of a common 3D shape.
Intermediate (L2)	Count the edges or vertices of a prism or pyramid.
Challenge (L3)	Match a 3D shape to its correct net.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Shape reasoning
Should Be Tested	Prisms, pyramids, and simple net recognition
Should NOT Be Tested	Surface area or volume calculations

4. Perimeter of Regular & Irregular Shapes

Topic Code	C4-GE-04
Domain	Geometry & Spatial Reasoning
Subtopics	Perimeter of regular polygons • Perimeter of irregular shapes • Missing side lengths
Concept Description	Students calculate the perimeter of regular and irregular shapes, including finding missing sides.
Learning Outcomes	Students can calculate the perimeter of an irregular shape and find a missing side length.
Skills Developed	Measurement reasoning, Problem solving, Spatial reasoning
Beginner (L1)	Find the perimeter of a regular polygon.
Intermediate (L2)	Find the perimeter of an irregular shape with given side lengths.
Challenge (L3)	Find a missing side length given the total perimeter of an irregular shape.
Visual Priority	High

Recommended Question Types	Picture-based MCQ, Word problem
Should Be Tested	Perimeter of regular and irregular polygons
Should NOT Be Tested	Perimeter involving curved shapes

5. Area of Rectangles & Composite Shapes

Topic Code	C4-GE-05
Domain	Geometry & Spatial Reasoning
Subtopics	Area formula (length $\times$ width) • Area of composite rectilinear shapes • Real-life area problems
Concept Description	Students calculate the area of rectangles using length $\times$ width and extend this to composite shapes.
Learning Outcomes	Students can calculate the area of a rectangle and a simple composite rectilinear shape.
Skills Developed	Measurement reasoning, Multiplicative reasoning, Spatial reasoning
Beginner (L1)	Calculate the area of a rectangle given its length and width.
Intermediate (L2)	Calculate the area of a composite shape made of two rectangles.
Challenge (L3)	Find a missing dimension given the area of a rectangle or composite shape.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Word problem
Should Be Tested	Area of rectangles and simple composite rectilinear shapes
Should NOT Be Tested	Area of triangles or curved shapes

Domain: Measurement

1. Unit Conversion (Length, Weight, Capacity)

Topic Code	C4-ME-01
Domain	Measurement
Subtopics	mm/cm/m/km • g/kg • ml/l • Converting between units
Concept Description	Students convert between related standard units of length, weight and capacity.
Learning Outcomes	Students can convert a measurement between two related standard units.
Skills Developed	Unit conversion, Place-value reasoning, Measurement
Beginner (L1)	Convert between cm and m using round numbers.
Intermediate (L2)	Convert between g and kg, or ml and l.
Challenge (L3)	Solve a multi-step problem requiring more than one unit conversion.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Word problem
Should Be Tested	Conversions between mm/cm/m, g/kg, ml/l
Should NOT Be Tested	Conversions involving km beyond simple whole-number contexts

2. Measurement Word Problems

Topic Code	C4-ME-02
Domain	Measurement
Subtopics	Real-life length/weight/capacity problems • Multi-step measurement problems • Combining units
Concept Description	Students solve real-life word problems involving length, weight and capacity, including conversions.
Learning Outcomes	Students can solve a multi-step word problem involving measurement and unit conversion.
Skills Developed	Problem solving, Unit conversion, Application
Beginner (L1)	Solve a one-step measurement word problem.
Intermediate (L2)	Solve a two-step measurement word problem involving conversion.
Challenge (L3)	Solve a measurement problem combining two different measurement types.
Visual Priority	Medium
Recommended Question Types	Word problem, Multi-step problem
Should Be Tested	One- and two-step measurement problems
Should NOT Be Tested	Problems requiring concepts beyond Class 4 scope

3. Temperature & Real-Life Measurement

Topic Code	C4-ME-03
Domain	Measurement
Subtopics	Reading temperature scales • Comparing and calculating temperature change • Real-life contexts
Concept Description	Students read temperature scales and calculate simple temperature changes in real-life contexts.
Learning Outcomes	Students can calculate the rise or fall in temperature between two readings.
Skills Developed	Measurement reading, Reasoning, Application
Beginner (L1)	Read a temperature from a scale.
Intermediate (L2)	Find the difference between two positive temperatures.
Challenge (L3)	Solve a word problem involving temperature change across a day.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Word problem
Should Be Tested	Positive-temperature reading and comparison
Should NOT Be Tested	Negative-temperature calculations

Domain: Time

1. 24-Hour Time & AM/PM

Topic Code	C4-TM-01
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Domain	Time
Subtopics	Converting 12-hour to 24-hour • AM/PM notation • Reading timetables
Concept Description	Students convert between 12-hour (AM/PM) and 24-hour time and read simple timetables.
Learning Outcomes	Students can convert a time between 12-hour and 24-hour notation.
Skills Developed	Time reasoning, Conversion, Real-life application
Beginner (L1)	Identify whether a given time is AM or PM.
Intermediate (L2)	Convert a 12-hour time to 24-hour notation.
Challenge (L3)	Read and interpret a simple timetable using 24-hour time.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Word problem
Should Be Tested	12-hour/24-hour conversion and simple timetables
Should NOT Be Tested	Timetables spanning time zones

2. Elapsed Time (Complex Problems)

Topic Code	C4-TM-02
Domain	Time
Subtopics	Elapsed time across AM/PM • Multi-step duration problems • Start/end time reasoning
Concept Description	Students calculate elapsed time in more complex situations, including across AM/PM.
Learning Outcomes	Students can calculate elapsed time between two times that cross the midday boundary.
Skills Developed	Time reasoning, Multi-step problem solving, Application
Beginner (L1)	Find elapsed time between two times within the same half of the day.
Intermediate (L2)	Find elapsed time between two times crossing AM/PM.
Challenge (L3)	Solve a multi-step problem involving several activities with different durations.
Visual Priority	Medium
Recommended Question Types	Word problem, Multi-step problem
Should Be Tested	Elapsed time within a single day, including across AM/PM
Should NOT Be Tested	Elapsed time spanning multiple days with time-zone complexity

3. Timelines & Calendar Reasoning

Topic Code	C4-TM-03
Domain	Time
Subtopics	Reading timelines • Calendar-based multi-step problems • Ordering events across dates
Concept Description	Students read timelines and solve calendar-based problems involving multiple dates or events.
Learning Outcomes	Students can read a timeline and solve a problem involving multiple calendar dates.
Skills Developed	Time reasoning, Sequencing, Problem solving
Beginner (L1)	Read a simple timeline to answer a direct question.
Intermediate (L2)	Find the number of days or weeks between two dates.

Challenge (L3)	Solve a multi-step problem ordering events across different months.
Visual Priority	Medium
Recommended Question Types	Picture-based MCQ, Word problem
Should Be Tested	Calendar reasoning across weeks and months
Should NOT Be Tested	Calculations spanning multiple years

Domain: Money

1. Multi-Step Money Word Problems

Topic Code	C4-MO-01
Domain	Money
Subtopics	Multi-item shopping • Combining totals and change • Decimal money amounts
Concept Description	Students solve multi-step money word problems, including with decimal amounts.
Learning Outcomes	Students can solve a multi-step money word problem involving several items and change.
Skills Developed	Problem solving, Decimal application, Number sense
Beginner (L1)	Find the total cost of three items with decimal prices.
Intermediate (L2)	Find the change from a purchase involving decimal prices.
Challenge (L3)	Solve a multi-step money problem combining totals, change and comparison.
Visual Priority	Medium
Recommended Question Types	Word problem, Multi-step problem
Should Be Tested	Multi-step money problems with decimal amounts
Should NOT Be Tested	Problems involving interest or percentages

2. Budgeting & Real-Life Financial Reasoning

Topic Code	C4-MO-02
Domain	Money
Subtopics	Planning within a budget • Saving toward a goal • Comparing spending options
Concept Description	Students apply mathematical reasoning to age-appropriate budgeting and saving scenarios.
Learning Outcomes	Students can plan a set of purchases within a budget or determine time to reach a savings goal.
Skills Developed	Problem solving, Real-life reasoning, Multi-step application
Beginner (L1)	Decide if a budget is enough for a planned purchase.
Intermediate (L2)	Plan several purchases that fit within a given budget.
Challenge (L3)	Solve a multi-step problem involving saving a fixed amount over several weeks.
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)
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Domain: Data Handling

1. Scaled Bar Graphs & Line Plots

Topic Code	C4-DT-01
Domain	Data Handling
Subtopics	Bar graphs with larger scales • Simple line plots • Reading between scale marks
Concept Description	Students read and interpret bar graphs with larger numeric scales and simple line plots.
Learning Outcomes	Students can read a value from a scaled bar graph, including between marked intervals.
Skills Developed	Data reading, Interpretation, Estimation
Beginner (L1)	Read a value that falls exactly on a scale mark.
Intermediate (L2)	Estimate a value that falls between two scale marks.
Challenge (L3)	Answer a multi-step question combining several bars or line-plot points.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Data interpretation
Should Be Tested	Scaled bar graphs and simple line plots
Should NOT Be Tested	Graphs requiring formal statistical calculation

2. Data Interpretation & Conclusions

Topic Code	C4-DT-02
Domain	Data Handling
Subtopics	Drawing conclusions from data • Comparing multiple data sets • Justifying an answer with data
Concept Description	Students interpret data sets to draw and justify simple conclusions.
Learning Outcomes	Students can draw a conclusion from a data set and justify it using specific values.
Skills Developed	Data interpretation, Reasoning, Communication
Beginner (L1)	State a simple fact directly readable from a data set.
Intermediate (L2)	Compare two data sets and draw a conclusion.
Challenge (L3)	Justify a conclusion using more than one piece of evidence from the data.
Visual Priority	Medium
Recommended Question Types	Data interpretation, Standard MCQ
Should Be Tested	Interpretation and justification using given data sets
Should NOT Be Tested	Mean, median or advanced statistics

Domain: Logical Reasoning

1. Multi-Condition Logic Puzzles

Topic Code	C4-LR-01
Domain	Logical Reasoning
Subtopics	Puzzles with multiple conditions • Systematic elimination • Organising information
Concept Description	Students solve puzzles requiring the simultaneous use of multiple logical conditions.
Learning Outcomes	Students can solve a puzzle by systematically applying multiple given conditions.
Skills Developed	Logical reasoning, Systematic thinking, Elimination
Beginner (L1)	Solve a puzzle using two conditions.
Intermediate (L2)	Solve a puzzle using three conditions.
Challenge (L3)	Solve a puzzle using four or more interacting conditions.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Logical reasoning
Should Be Tested	Multi-condition puzzles built from Class 4 concepts
Should NOT Be Tested	Puzzles requiring formal logic notation

2. Pattern & Relationship Puzzles

Topic Code	C4-LR-02
Domain	Logical Reasoning
Subtopics	Number pattern puzzles • Shape relationship puzzles • Find-the-rule challenges
Concept Description	Students solve puzzles requiring the identification of a hidden pattern or relationship.
Learning Outcomes	Students can identify a hidden rule connecting a set of numbers or shapes.
Skills Developed	Pattern recognition, Logical reasoning, Problem solving
Beginner (L1)	Identify a simple pattern rule from given examples.
Intermediate (L2)	Apply an identified rule to find a missing value.
Challenge (L3)	Identify a two-step rule connecting a more complex set of examples.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Logical reasoning
Should Be Tested	Pattern/relationship puzzles built from Class 4 concepts
Should NOT Be Tested	Puzzles requiring formal algebraic notation

3. Elimination & Deduction Problems

Topic Code	C4-LR-03
Domain	Logical Reasoning
Subtopics	Process of elimination • Deductive chains • Organising clues in a table
Concept Description	Students use elimination and deductive chains to solve structured reasoning problems.
Learning Outcomes	Students can use a process of elimination, often organised in a table, to solve a deduction problem.
Skills Developed	Deductive reasoning, Systematic thinking, Elimination

Beginner (L1)	Eliminate one incorrect option using a single clue.
Intermediate (L2)	Use a short chain of clues to reach one conclusion.
Challenge (L3)	Solve a deduction problem requiring an organised table of several clues.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Logical reasoning
Should Be Tested	Structured deduction problems with organisable clues
Should NOT Be Tested	Complex multi-variable logic grids beyond Class 4 scope

Domain: Problem Solving

1. Multi-Step Real-Life Problems

Topic Code	C4-PS-01
Domain	Problem Solving
Subtopics	Three-step stories • Combined-domain problems • Understand-Plan-Solve-Check approach
Concept Description	Students solve real-life problems requiring three or more connected steps across domains.
Learning Outcomes	Students can plan, solve and check 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 within Class 4 number range.
Challenge (L3)	Solve a three- or four-step problem combining two or more mathematical domains.
Visual Priority	Medium
Recommended Question Types	Word problem, Multi-step problem
Should Be Tested	Multi-step real-life problems across domains
Should NOT Be Tested	Problems requiring concepts beyond Class 4 scope

2. Non-Routine Challenge Problems

Topic Code	C4-PS-02
Domain	Problem Solving
Subtopics	Unfamiliar problem types • Hidden relationships • Competition-style reasoning
Concept Description	Students apply flexible, strategic thinking to genuinely unfamiliar competition-style problems.
Learning Outcomes	Students can approach an unfamiliar problem strategically and explain their reasoning.
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 4 concepts only
Should NOT Be Tested	Problems requiring concepts beyond Class 4 scope

Domain: Mental Mathematics & Estimation

1. Mental Math Strategies for Larger Numbers

Topic Code	C4-MN-01
Domain	Mental Mathematics & Estimation
Subtopics	Mental strategies for 4-5 digit numbers • Combining known facts • Strategy comparison
Concept Description	Students apply and compare efficient mental strategies for calculations with larger numbers.
Learning Outcomes	Students can select and apply an efficient mental strategy for a larger-number calculation.
Skills Developed	Mental maths, Strategy selection, Number sense
Beginner (L1)	Apply a basic mental strategy to a two-step calculation.
Intermediate (L2)	Apply a mental strategy involving multiplication or division facts.
Challenge (L3)	Compare two mental strategies and identify the more efficient one for a given problem.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Mental maths question
Should Be Tested	Mental strategies within Class 4 number range
Should NOT Be Tested	Written algorithms disguised as mental maths

2. Estimation, Approximation & Checking Reasonableness

Topic Code	C4-MN-02
Domain	Mental Mathematics & Estimation
Subtopics	Estimating before calculating • Approximating multi-step results • Checking calculated answers
Concept Description	Students estimate and approximate answers to more complex calculations and judge reasonableness.
Learning Outcomes	Students can estimate the result of a multi-step calculation and judge if an answer is reasonable.
Skills Developed	Estimation, Reasoning, Self-checking
Beginner (L1)	Estimate the result of a two-number calculation by rounding.
Intermediate (L2)	Estimate the result of a multi-step calculation.
Challenge (L3)	Identify the most reasonable of several possible answers without calculating exactly.
Visual Priority	Low
Recommended Question Types	Standard MCQ, Mental maths question
Should Be Tested	Estimation and reasonableness checks within Class 4 scope
Should NOT Be Tested	Formal significant-figure rounding

9. Class 3 → Class 4 Progression Map

This spiral progression map shows, for every domain, how Class 3 foundations develop into Class 4 fluency and reasoning, and what a Challenge-level extension looks like.

Domain	Class 3 Foundation	Class 4 Development	Challenge Extension
Number & Number Sense	Numbers to 10,000; place value to thousands; intro to factors/multiples.	Numbers to 100,000; rounding/approximation; prime vs composite; square numbers.	Multi-digit reasoning, number-property puzzles and factor/multiple combinations.
Addition & Subtraction	Multi-digit addition/subtraction with regrouping; estimation.	Larger-number addition/subtraction; efficient mental strategies; multi-step problems.	Multi-step, multi-digit reasoning with regrouping across several place values.
Multiplication & Division	Facts to 10×10 ; 2-digit $\times$ 1-digit multiplication; division with remainders.	2-digit $\times$ 2-digit multiplication; long division by 1-digit divisor; factor/multiple connections.	Multi-step word problems combining multiplication, division and remainder interpretation.
Fractions	Unit/proper fractions; equivalent fractions; comparing simple fractions.	Equivalent/simplifying; improper fractions and mixed numbers; fraction of a quantity; same-denominator addition/subtraction.	Comparing unlike representations and multi-step fraction word problems.
Decimals	Introduction to tenths; decimals and money connection.	Tenths and hundredths; comparing/ordering; decimal addition/subtraction.	Converting between fractions and decimals; multi-step decimal money problems.
Patterns & Algebraic Thinking	Growing number patterns; missing values in simple equations.	Growing/shrinking patterns; function machines; two-operation equations.	Predicting distant pattern terms and solving multi-step unknowns.
Geometry & Spatial Reasoning	2D shape properties, right angles, parallel/perpendicular lines, perimeter, area by counting.	Angle classification, quadrilateral properties, 3D faces/edges/vertices, perimeter of irregular shapes, area formula.	Multi-property shape identification and composite-shape perimeter/area problems.
Measurement	Standard units with simple conversions; temperature reading.	Unit conversion across length/weight/capacity; multi-step measurement word problems.	Word problems requiring more than one conversion or combined measurement types.
Time	Time to the minute; elapsed time within a day; simple calendar problems.	24-hour time; elapsed time across AM/PM; timelines and multi-date calendar reasoning.	Multi-step duration and calendar problems spanning several events or dates.
Money	Money word problems; making change; simple budgeting.	Multi-step money problems with decimals; budgeting and saving scenarios.	Multi-step problems combining totals, change, comparison and saving goals.
Data Handling	Bar graphs and tables with scales; totals and differences.	Scaled bar graphs and line plots; interpreting and justifying conclusions.	Multi-step interpretation questions requiring evidence from more than one part of the data.
Logical Reasoning	Number/logic puzzles; deduction with two to three clues.	Multi-condition puzzles; pattern/relationship puzzles; organised elimination with tables.	Puzzles with four or more interacting conditions requiring systematic organisation.
Problem Solving	Two- and three-step word problems; guided non-routine problems.	Multi-step real-life problems across domains; genuinely unfamiliar non-routine problems.	Three- to four-step problems combining two or more mathematical domains.

Domain	Class 3 Foundation	Class 4 Development	Challenge Extension
Mental Mathematics & Estimation	Mental strategies within 10,000; estimation and reasonableness checks.	Mental strategies for larger numbers; estimating multi-step results.	Comparing the efficiency of different mental strategies for the same problem.

10. MCQ Assessment Blueprint

The following domain-weighting tables give future question writers a recommended percentage distribution for building a balanced Markhor Junior Learner Level question bank. Multiplication & Division and Fractions carry the strongest weighting in both classes, reflecting their centrality to Learner Level fluency, while Fractions and Geometry grow further in Class 4 as reasoning demands increase. Mental Mathematics & Estimation is intentionally woven throughout other domains as a skill rather than heavily weighted as a standalone category.

Class 3 — Domain Distribution

Mathematical Domain	% of Question Bank
Number & Number Sense	12%
Addition & Subtraction	14%
Multiplication & Division	14%
Fractions	10%
Decimals	6%
Patterns & Algebraic Thinking	5%
Geometry & Spatial Reasoning	10%
Measurement	6%
Time	5%
Money	5%
Data Handling	5%
Logical Reasoning	4%
Problem Solving	3%
Mental Mathematics & Estimation	1%
Total	100%

Class 4 — Domain Distribution

Mathematical Domain	% of Question Bank
Number & Number Sense	10%
Addition & Subtraction	11%
Multiplication & Division	15%
Fractions	12%
Decimals	8%
Patterns & Algebraic Thinking	5%
Geometry & Spatial Reasoning	11%
Measurement	6%
Time	4%

Mathematical Domain	% of Question Bank
Money	4%
Data Handling	5%
Logical Reasoning	5%
Problem Solving	3%
Mental Mathematics & Estimation	1%
Total	100%

11. Difficulty Distribution

Reflecting the Learner Level's more competition-oriented nature, both classes carry a larger share of Intermediate and Challenge items than the Beginner Level, with Class 4 shifting further toward Challenge as independent reasoning matures.

Class 3

Difficulty Level	% of Question Bank
Level 1 — Beginner	35%
Level 2 — Intermediate	42%
Level 3 — Challenge	23%

Class 4

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

12. Future Question Bank Tagging System

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

CLASS – DOMAIN – DIFFICULTY – TYPE – SEQUENCE

Example: C4-FR-C-WRD-021 → Class 4, Fractions, Challenge, Word problem, item 21.

Class Codes

Code	Meaning
C3	Learner Level — Class 3
C4	Learner Level — Class 4

Domain Codes

Code	Meaning
NS	Number & Number Sense
AS	Addition & Subtraction
MD	Multiplication & Division
FR	Fractions
DC	Decimals
PA	Patterns & Algebraic Thinking
GE	Geometry & Spatial Reasoning
ME	Measurement
TM	Time
MO	Money
DT	Data Handling
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
VMCQ	Visual multiple-choice question
PMCQ	Picture-based multiple-choice question
PAT	Pattern question

Code	Meaning
MSN	Missing number question
MAT	Matching question
LGR	Logical reasoning question
WRD	Word / real-life problem
MSP	Multi-step problem
DIN	Data interpretation question
SHR	Shape / geometry reasoning question
MSR2	Measurement question
FRQ	Fraction question
CMP	Comparison question
MSR	Mental maths / strategy question

13. Assessment Alignment

This curriculum is structured to directly support every future Markhor Junior assessment product at the Learner 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 fourteen 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, reasoning, mental mathematics and problem solving, weighted according to the official domain and difficulty distributions in Sections 10 and 11.

14. 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 3

Code	Domain	Topic	Beginner	Intermediate	Challenge	Visual
C3-NS-01	NS	Numbers up to 10,000 & Place Value	Identify the value of a digit in a 3-digit number.	Identify the value of a digit in a 4-digit number.	Solve a problem where regrouping across thousands changes the answer.	Medium
C3-NS-02	NS	Expanded Form & Standard Form	Write a 3-digit number in expanded form.	Write a 4-digit number in expanded form and back.	Identify an incorrectly expanded number and correct it.	Low
C3-NS-03	NS	Comparing & Ordering Numbers (4-digit)	Compare two 4-digit numbers.	Order four or more 4-digit numbers.	Find a missing digit that satisfies a comparison rule.	Medium
C3-NS-04	NS	Factors and Multiples (Introduction)	List the first few multiples of a small number.	Find all factors of a two-digit number.	Find a number that satisfies two factor/multiple conditions at once.	Low
C3-AS-05	AS	Multi-Digit Addition with Regrouping	Add two 3-digit numbers with one regrouping step.	Add two 4-digit numbers with multiple regroupings.	Add three numbers with several regrouping steps and verify reasonableness.	Low
C3-AS-06	AS	Multi-Digit Subtraction with Regrouping	Subtract two 3-digit numbers with one regrouping step.	Subtract two 4-digit numbers with multiple regroupings.	Subtract across zeros (e.g. $4000 - 1856$) and verify the result.	Low
C3-AS-07	AS	Estimation & Mental Strategies (Add/Sub)	Round two numbers before estimating a sum.	Use a mental strategy to add/subtract without written working.	Decide whether a given answer is reasonable without calculating exactly.	Low
C3-MD-08	MD	Multiplication Facts & Arrays (up to 10×10)	Recall facts for the 2, 5 and 10 times tables.	Recall facts for all times tables up to 10.	Solve a puzzle requiring several multiplication facts and reasoning.	Medium
C3-MD-09	MD	Multi-Digit Multiplication (2-digit $\times$ 1-digit)	Multiply a 2-digit number by a 1-digit number without regrouping.	Multiply a 2-digit number by a 1-digit number with regrouping.	Solve a multi-step problem involving 2-digit by 1-digit multiplication.	Low
C3-MD-10	MD	Division with and without Remainders	Solve a division fact within known times tables.	Solve a division problem with a remainder.	Decide how to interpret a remainder in a real-life context (round up/down).	Medium
C3-MD-11	MD	Multiplication–Division Word Problems	Solve a one-step multiplication or division story problem.	Solve a two-step story problem combining multiplication/division.	Solve a story problem combining multiplication/division with addition/subtraction.	Medium
C3-FR-12	FR	Understanding Fractions (Unit & Proper Fractions)	Identify a unit fraction shown visually.	Identify a proper fraction shown visually or numerically.	Identify an incorrect visual representation of a given fraction.	High
C3-FR-13	FR	Equivalent Fractions	Identify two visually equivalent fractions.	Generate an equivalent fraction by multiplying numerator and denominator.	Identify which of several fractions is NOT equivalent to a given fraction.	High
C3-FR-14	FR	Comparing & Ordering Fractions	Compare two fractions with the same denominator.	Compare two fractions with related denominators (e.g. quarters and eighths).	Order a mixed set of simple fractions from smallest to largest.	High
C3-DC-15	DC	Introduction to Decimals (Tenths)	Read a decimal number to one decimal place.	Place a decimal (tenths) on a number line.	Compare a fraction and a decimal representing the same value.	High
C3-DC-16	DC	Decimals and Money Connection	Read a simple price written with one decimal place.	Compare two prices written as decimals.	Solve a simple money word problem using one-decimal-place amounts.	Medium

Code	Domain	Topic	Beginner	Intermediate	Challenge	Visual
C3-PA-17	PA	Number Patterns & Growing Patterns	Extend a simple growing pattern by one or two steps.	Describe the rule of a growing pattern in words.	Predict a distant term in a growing pattern using the rule.	Medium
C3-PA-18	PA	Missing Values & Simple Equations	Find a missing value in a one-step equation.	Balance an equation with operations on both sides.	Solve a two-step missing-value problem.	Low
C3-GE-19	GE	2D Shape Properties & Angles (Introduction)	Identify a right angle in a shape or picture.	Classify a shape by counting sides and identifying angle types informally.	Identify a shape from a description combining sides and angle properties.	High
C3-GE-20	GE	Lines: Parallel & Perpendicular	Identify a pair of parallel lines in a picture.	Identify a pair of perpendicular lines in a shape.	Identify all parallel/perpendicular pairs in a complex figure.	High
C3-GE-21	GE	Perimeter of Shapes	Find the perimeter of a shape by adding given side lengths.	Calculate the perimeter of a rectangle or square using its dimensions.	Find a missing side length given the perimeter of a shape.	High
C3-GE-22	GE	Area of Rectangles (Counting Squares)	Count the square units covering a simple grid shape.	Find the area of a rectangle shown on a grid.	Compare the areas of two irregular grid shapes.	High
C3-ME-23	ME	Length, Weight & Capacity (Standard Units)	Read a length, weight or capacity from a simple instrument.	Convert between simple units (e.g. cm to m, g to kg) using round numbers.	Solve a word problem requiring a unit conversion and calculation.	High
C3-ME-24	ME	Temperature	Read a temperature shown on a simple thermometer diagram.	Compare two given temperatures.	Solve a word problem involving a rise or fall in temperature.	High
C3-TM-25	TM	Reading Time to the Minute	Read a clock showing a time to the nearest 5 minutes.	Read a clock showing a time to the exact minute.	Match an unusual analogue time to its correct digital equivalent.	High
C3-TM-26	TM	Elapsed Time & Calendars	Find the elapsed time between two o'clock times.	Find the elapsed time between two times to the minute.	Solve a multi-step problem involving start time, duration and a calendar date.	Medium
C3-MO-27	MO	Money Calculations & Word Problems	Add the cost of two items.	Find the total cost of several items and the change from a round amount.	Solve a multi-step money word problem with more than two items.	Medium
C3-MO-28	MO	Making Change & Simple Budgeting	Find change from a round amount after one purchase.	Decide whether a given budget is enough for several items.	Plan a set of purchases that fits within a given budget.	Medium
C3-DT-29	DT	Bar Graphs & Tables	Read a single value from a bar graph or table.	Compare two or more categories from a bar graph or table.	Answer a two-step question combining several values from a graph or table.	High
C3-DT-30	DT	Interpreting & Comparing Data Sets	Find the total of two categories in a data set.	Find the difference between the largest and smallest category.	Draw a conclusion requiring comparison across the whole data set.	Medium
C3-LR-31	LR	Number & Logic Puzzles	Solve a simple number grid puzzle.	Solve a puzzle requiring two combined number facts.	Solve a puzzle requiring several reasoning steps.	Medium
C3-LR-32	LR	Deductive Reasoning Problems	Use one or two clues to eliminate options.	Use three clues to find the correct answer.	Solve a deduction puzzle with four or more interacting clues.	Medium
C3-PS-33	PS	Multi-Step Word Problems	Solve a two-step problem with small, familiar numbers.	Solve a two-step problem within 10,000.	Solve a three-step problem combining several operations.	Medium
C3-PS-34	PS	Non-Routine Problem Solving	Solve a simple non-routine problem with guided structure.	Solve a non-routine problem combining two known concepts.	Solve a genuinely unfamiliar competition-style problem.	Medium
C3-MN-35	MN	Mental Math Strategies	Apply a basic mental strategy to a simple fact.	Apply a mental strategy to a two-step calculation.	Choose the most efficient strategy among several options for an unfamiliar fact.	Low
C3-MN-36	MN	Estimation & Reasonableness of Answers	Round numbers to estimate a simple sum or product.	Judge whether a given answer to a calculation is reasonable.	Identify which of several answers is most reasonable without calculating exactly.	Low

Class 4

Code	Domain	Topic	Beginner	Intermediate	Challenge	Visual
C4-NS-01	NS	Numbers up to 100,000 & Place Value	Identify the value of a digit in a 4-digit number.	Identify the value of a digit in a 5-digit number.	Solve a problem where regrouping across ten-thousands changes the answer.	Low
C4-NS-02	NS	Rounding & Approximation	Round a number to the nearest 10 or 100.	Round a number to the nearest 1000 in a real-life context.	Find a range of numbers that round to a given value.	Low
C4-NS-03	NS	Factors, Multiples & Prime Numbers	List the factors of a number up to 50.	Identify common factors of two numbers.	Classify numbers up to 50 as prime or composite and justify the classification.	Low
C4-NS-04	NS	Number Relationships & Properties	Identify a square number up to 100 (e.g. 25, 36).	Describe a relationship between a set of numbers.	Solve a puzzle requiring reasoning about number properties.	Low
C4-AS-05	AS	Addition & Subtraction of Larger Numbers	Add or subtract two 4-digit numbers with regrouping.	Add or subtract two 5-digit numbers with multiple regroupings.	Solve a calculation requiring regrouping across several place values, and verify it.	Low
C4-AS-06	AS	Multi-Step Addition/Subtraction Word Problems	Solve a two-step problem with familiar numbers.	Solve a two-step problem within 100,000.	Solve a three-step problem with an unfamiliar or layered context.	Medium
C4-AS-07	AS	Efficient Mental Strategies (Add/Sub)	Add or subtract a multiple of 100 or 1000 mentally.	Use compensation to solve a calculation mentally.	Choose the most efficient strategy among several for an unfamiliar calculation.	Low
C4-MD-08	MD	Multi-Digit Multiplication (2-digit $\times$ 2-digit)	Multiply a 2-digit number by a 1-digit number with regrouping.	Multiply two 2-digit numbers using an area model.	Solve a multi-step problem involving 2-digit by 2-digit multiplication.	Medium
C4-MD-09	MD	Long Division with Remainders	Divide a 2-digit number by a 1-digit number with a remainder.	Divide a 3-digit number by a 1-digit number with a remainder.	Solve a word problem requiring correct interpretation of a remainder.	Low
C4-MD-10	MD	Factors, Multiples & Multiplication Connections	Find the first few common multiples of two small numbers.	Find the highest common factor of two numbers up to 50 by listing.	Solve a puzzle requiring both factor and multiple reasoning together.	Low
C4-MD-11	MD	Mental Multiplication & Division Strategies	Multiply or divide a whole number by 10 mentally.	Use doubling or halving to solve a multiplication or division fact.	Choose an efficient mental strategy for an unfamiliar multiplication/division fact.	Low
C4-MD-12	MD	Multi-Step Multiplication/Division Word Problems	Solve a two-step problem combining multiplication and addition/subtraction.	Solve a two-step problem combining multiplication and division.	Solve a three-step problem combining several operations.	Medium
C4-FR-13	FR	Equivalent Fractions & Simplifying	Identify an equivalent fraction from a visual model.	Simplify a fraction to lowest terms informally.	Identify which of several fractions simplifies to a given fraction.	High
C4-FR-14	FR	Improper Fractions & Mixed Numbers	Identify a mixed number shown visually.	Convert an improper fraction to a mixed number.	Compare an improper fraction and a mixed number without converting both fully.	High
C4-FR-15	FR	Fraction of a Quantity	Find a unit fraction of a small quantity (e.g. $\frac{1}{4}$ of 20).	Find a non-unit fraction of a quantity (e.g. $\frac{3}{4}$ of 24).	Solve a word problem requiring a fraction of a quantity in context.	Medium
C4-FR-16	FR	Addition & Subtraction of Simple Fractions	Add two fractions with the same denominator, answer less than 1.	Add or subtract fractions with the same denominator, including results over 1.	Solve a word problem requiring addition/subtraction of same-denominator fractions.	High
C4-DC-17	DC	Decimals (Tenths & Hundredths)	Read a decimal number to one decimal place.	Read and represent a decimal number to two decimal places.	Convert between a fraction (tenths/hundredths) and its decimal equivalent.	High
C4-DC-18	DC	Comparing & Ordering Decimals	Compare two decimals to one decimal place.	Compare two decimals to two decimal places.	Order a mixed set of decimals with differing	Medium

Code	Domain	Topic	Beginner	Intermediate	Challenge	Visual
					numbers of decimal places.	
C4-DC-19	DC	Decimal Addition & Subtraction	Add two decimals to one decimal place.	Add or subtract two decimals to two decimal places.	Solve a multi-step word problem involving decimal addition and subtraction.	Low
C4-PA-20	PA	Growing & Shrinking Patterns	Extend a simple growing or shrinking pattern.	Describe the rule of a growing or shrinking pattern.	Predict a distant term in a pattern using its rule.	Medium
C4-PA-21	PA	Input/Output Patterns & Function Machines	Complete a simple input/output table with a one-step rule.	Find the rule connecting inputs and outputs in a table.	Find a rule involving two operations from an input/output table.	Medium
C4-PA-22	PA	Solving Simple Equations & Balance Problems	Find a missing value in a one-operation equation.	Find a missing value in a two-operation equation.	Solve an equation where the unknown appears on both sides in a simple form.	Low
C4-GE-23	GE	Angles: Types & Measurement (Introduction)	Identify whether an angle is a right angle.	Classify an angle as acute, right or obtuse.	Order a set of angles from smallest to largest by estimation.	High
C4-GE-24	GE	2D Shape Classification & Properties	Name a common quadrilateral (square, rectangle, rhombus, trapezium).	Classify a shape as regular or irregular.	Identify a shape from a description combining several properties.	High
C4-GE-25	GE	3D Shape Properties (Faces, Edges, Vertices)	Count the faces of a common 3D shape.	Count the edges or vertices of a prism or pyramid.	Match a 3D shape to its correct net.	High
C4-GE-26	GE	Perimeter of Regular & Irregular Shapes	Find the perimeter of a regular polygon.	Find the perimeter of an irregular shape with given side lengths.	Find a missing side length given the total perimeter of an irregular shape.	High
C4-GE-27	GE	Area of Rectangles & Composite Shapes	Calculate the area of a rectangle given its length and width.	Calculate the area of a composite shape made of two rectangles.	Find a missing dimension given the area of a rectangle or composite shape.	High
C4-ME-28	ME	Unit Conversion (Length, Weight, Capacity)	Convert between cm and m using round numbers.	Convert between g and kg, or ml and l.	Solve a multi-step problem requiring more than one unit conversion.	Medium
C4-ME-29	ME	Measurement Word Problems	Solve a one-step measurement word problem.	Solve a two-step measurement word problem involving conversion.	Solve a measurement problem combining two different measurement types.	Medium
C4-ME-30	ME	Temperature & Real-Life Measurement	Read a temperature from a scale.	Find the difference between two positive temperatures.	Solve a word problem involving temperature change across a day.	Medium
C4-TM-31	TM	24-Hour Time & AM/PM	Identify whether a given time is AM or PM.	Convert a 12-hour time to 24-hour notation.	Read and interpret a simple timetable using 24-hour time.	Medium
C4-TM-32	TM	Elapsed Time (Complex Problems)	Find elapsed time between two times within the same half of the day.	Find elapsed time between two times crossing AM/PM.	Solve a multi-step problem involving several activities with different durations.	Medium
C4-TM-33	TM	Timelines & Calendar Reasoning	Read a simple timeline to answer a direct question.	Find the number of days or weeks between two dates.	Solve a multi-step problem ordering events across different months.	Medium
C4-MO-34	MO	Multi-Step Money Word Problems	Find the total cost of three items with decimal prices.	Find the change from a purchase involving decimal prices.	Solve a multi-step money problem combining totals, change and comparison.	Medium
C4-MO-35	MO	Budgeting & Real-Life Financial Reasoning	Decide if a budget is enough for a planned purchase.	Plan several purchases that fit within a given budget.	Solve a multi-step problem involving saving a fixed amount over several weeks.	Medium
C4-DT-36	DT	Scaled Bar Graphs & Line Plots	Read a value that falls exactly on a scale mark.	Estimate a value that falls between two scale marks.	Answer a multi-step question combining several bars or line-plot points.	High

Code	Domain	Topic	Beginner	Intermediate	Challenge	Visual
C4-DT-37	DT	Data Interpretation & Conclusions	State a simple fact directly readable from a data set.	Compare two data sets and draw a conclusion.	Justify a conclusion using more than one piece of evidence from the data.	Medium
C4-LR-38	LR	Multi-Condition Logic Puzzles	Solve a puzzle using two conditions.	Solve a puzzle using three conditions.	Solve a puzzle using four or more interacting conditions.	Medium
C4-LR-39	LR	Pattern & Relationship Puzzles	Identify a simple pattern rule from given examples.	Apply an identified rule to find a missing value.	Identify a two-step rule connecting a more complex set of examples.	High
C4-LR-40	LR	Elimination & Deduction Problems	Eliminate one incorrect option using a single clue.	Use a short chain of clues to reach one conclusion.	Solve a deduction problem requiring an organised table of several clues.	Medium
C4-PS-41	PS	Multi-Step Real-Life Problems	Solve a two-step problem with familiar numbers.	Solve a three-step problem within Class 4 number range.	Solve a three- or four-step problem combining two or more mathematical domains.	Medium
C4-PS-42	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
C4-MN-43	MN	Mental Math Strategies for Larger Numbers	Apply a basic mental strategy to a two-step calculation.	Apply a mental strategy involving multiplication or division facts.	Compare two mental strategies and identify the more efficient one for a given problem.	Low
C4-MN-44	MN	Estimation, Approximation & Checking Reasonableness	Estimate the result of a two-number calculation by rounding.	Estimate the result of a multi-step calculation.	Identify the most reasonable of several possible answers without calculating exactly.	Low

15. Final Quality Control Summary

This curriculum has been reviewed against the following standards:

- Class 3 is appropriately more advanced than Beginner Level Class 1–2, with fractions, decimals and perimeter/area introduced as substantial new domains.
- Class 4 is clearly more advanced than Class 3, with no unnecessary repetition.
- The Learner Level connects naturally with the Beginner Level through a consistent spiral progression.
- Arithmetic fluency and mathematical reasoning are balanced throughout; fractions and decimals receive appropriate emphasis.
- Geometry, spatial reasoning, measurement, time, money and data handling are fully represented at both levels.
- Problem solving and logical reasoning 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.
- Every topic can generate high-quality MCQs across the six 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.