

MARKHOR JUNIOR MATHEMATICS CURRICULUM

Toddler Level
Nursery & Kindergarten (KG)

An Original, Play-Based Early Years Mathematics Framework

Official Curriculum Document
Markhor Junior Contest
2026

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1. Introduction & Curriculum Philosophy

The Markhor Junior Mathematics Curriculum — Toddler Level is the foundation of the entire Markhor Junior Contest progression, covering Nursery and Kindergarten (KG). It is the first stage of: Toddler (Nursery/KG) → Beginner (Class 1–2) → Learner (Class 3–4) → Elementary (Class 5–6) → Pioneer (Class 7–8) → Aspirant (Class 9–10 / O-Level / A-Level).

This curriculum is deliberately designed for early childhood learners and does not resemble a simplified primary-school syllabus. Its emphasis throughout is on Number Sense, Recognition, Understanding, Visual Learning, Patterns, Shapes, Counting, Comparison, Early Reasoning and Fun Mathematical Thinking, built entirely around play-based, hands-on, visual early-years learning principles.

This document is the official foundation for all future Markhor Junior Toddler Level materials, including the course outline, website syllabus, practice activities, visual learning resources, the early mathematics question bank, age-appropriate MCQs, contest preparation, number games and brain games.

2. Curriculum Architecture

The curriculum follows a consistent architecture for every topic:

- Stage → Mathematical Domain → Topic → Subtopics → Learning Outcomes → Skills → Developmental Expectation → Assessment Type

Seventeen mathematical domains are used consistently across both stages. Number Bonds & Composition and Mental Mathematics are introduced only in KG, once children are developmentally ready:

- Number Sense (NS)
- Counting (CO)
- Early Addition (AD)
- Early Subtraction (SU)
- Number Bonds & Composition (NB)
- Patterns (PA)
- Shapes & Geometry (SH)
- Spatial Awareness (SP)
- Comparison (CM)
- Sorting & Classification (SO)
- Measurement (ME)
- Time (TM)
- Money Awareness (MO)
- Data & Graphical Thinking (DT)
- Logical Reasoning (LR)
- Early Problem Solving (PS)
- Mental Mathematics (MM)

3. Three-Tier Difficulty System

Every topic is structured across three developmentally appropriate difficulty levels. Challenge never relies on advanced mathematics — it comes from thinking, observation, patterns, relationships, logic and visual reasoning.

- Level 1 — Foundation: recognition and direct understanding.
- Level 2 — Application: simple application in unfamiliar visual situations.
- Level 3 — Challenge: creative thinking and age-appropriate reasoning, never difficult calculation.

4. Stage-Specific Differentiation

Nursery and KG have distinct academic focuses; KG is not a simple repeat of Nursery content:

- Nursery — Early Number Awareness + Counting + Shapes + Patterns + Comparison + Mathematical Language.
- Kindergarten (KG) — Early Mathematical Fluency + Number Operations + Patterns + Measurement + Geometry + Problem Solving.

5. Early Years Education Principles

This curriculum prioritizes play-based learning, visual learning, hands-on learning with concrete objects and manipulatives, number recognition, counting, sorting, matching, comparing, patterns, shapes, spatial awareness, measurement awareness, mathematical vocabulary, early reasoning, problem solving, curiosity, confidence and exploration. It deliberately avoids excessive memorization, long written calculations, abstract notation, complex formulas, developmentally inappropriate concepts and heavy text-based questions.

6. Mathematical Connections

Topics are not taught in isolation. Question writers should draw on these natural connections:

- Counting $\leftrightarrow$ Addition (counting on as the basis of adding)
- Counting $\leftrightarrow$ Subtraction (counting back as the basis of taking away)
- Numbers $\leftrightarrow$ Quantity (numerals as symbols for real amounts)
- Shapes $\leftrightarrow$ Spatial Awareness (recognizing and locating shapes in space)
- Patterns $\leftrightarrow$ Numbers (repeating and growing patterns as an early number sense)
- Sorting $\leftrightarrow$ Data (classification as the basis of simple graphs)
- Measurement $\leftrightarrow$ Comparison (measuring as an extension of comparing)
- Time $\leftrightarrow$ Sequencing (ordering events as an early time concept)
- Money $\leftrightarrow$ Counting (counting coins as an application of counting)
- Number Bonds $\leftrightarrow$ Addition/Subtraction (parts and wholes underlying both operations)
- Visual Reasoning $\leftrightarrow$ Problem Solving (visual puzzles building general problem-solving habits)

7. Visual & Language Requirements

Assessment content for Nursery and KG keeps instructions short, uses simple vocabulary, prefers pictures over long sentences, uses large and clear numbers, and avoids complicated wording or unnecessary reading requirements. Mathematical difficulty is never confused with reading difficulty — every topic in this document is assigned a Visual Priority, and most Toddler Level topics are High Visual Priority.

8. Real-Life & Play-Based Contexts

Topics and future questions draw on familiar, child-friendly contexts: toys, fruits, animals, school, family, games, blocks, colours, shapes, shopping, food, the playground and daily routines.

9. Developmental Boundary

The Toddler Level deliberately avoids long written calculations, complex algorithms, advanced fractions, formal algebra, complex multiplication/division, complex geometry, advanced measurement, difficult word problems, excessive memorization and long reading passages. The focus throughout remains on Early Numeracy, Mathematical Thinking, Visual Learning, Confidence and Problem Solving.

Markhor Junior Mathematics — Toddler Level — Nursery

Course Overview

Markhor Junior Mathematics — Toddler Level — Nursery introduces the very foundations of mathematical thinking through play. Children build number awareness and counting to 10, recognize shapes and simple patterns, compare and sort everyday objects, and develop early spatial and positional language. Concrete objects, pictures and hands-on activities are used throughout, with concepts introduced through games, stories and everyday routines rather than written work — building curiosity, confidence and a genuine enjoyment of mathematical thinking.

Mathematical Domains & Topics

Number Sense

- Number Awareness & Recognition (0–5)
- Number Recognition (6–10)
- Matching Numbers with Quantities

Counting

- Counting Objects (1–5)
- Counting Objects (6–10)
- One-to-One Correspondence

Early Addition

- Early Addition — Joining Groups

Early Subtraction

- Early Subtraction — Taking Away

Patterns

- Simple Repeating Patterns (Color & Shape)
- Continue the Pattern

Shapes & Geometry

- 2D Shape Recognition
- 3D Shape Recognition (Introductory)
- Shapes in Everyday Objects

Spatial Awareness

- Position Words (In/Out, Up/Down, Above/Below)
- Direction & Simple Routes

Comparison

- Size Comparison (Big/Small, Long/Short, Tall/Short)
- Quantity Comparison (More/Less, Same/Different)

Sorting & Classification

- Sorting by Colour & Shape
- Sorting by Size & Type

Measurement

- Measurement Awareness (Length, Height, Weight)

Time

- Everyday Time Concepts (Day/Night, Before/After)

Money Awareness

- Money Awareness — Recognizing & Matching

Data & Graphical Thinking

- Simple Picture Sorting & Object Graphs

Logical Reasoning

- Odd One Out & Matching Puzzles
- Sequencing — First, Last & What Comes Next

Detailed Topic-by-Topic Curriculum — Nursery

Domain: Number Sense

1. Number Awareness & Recognition (0–5)

Topic Code	NUR-NS-01
Domain	Number Sense
Subtopics	Recognizing numerals 0–5 • Saying number names • Pointing to a named number
Concept Description	Children become aware of numbers 0–5 as symbols and names, recognizing them in everyday contexts.
Learning Outcomes	Children can recognize and name numbers 0–5 when shown.
Skills Developed	Number recognition, Visual discrimination, Vocabulary
Foundation (L1)	Point to a named number card from 0–5.
Application (L2)	Match a number card to a picture with the same quantity.
Challenge (L3)	Find a hidden or partly-covered number among 0–5 by its visible shape.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Matching
Question Bank Boundary — Should Test	Recognizing and naming numerals 0–5
Question Bank Boundary — Should NOT Test	Writing numerals or numbers beyond 5

2. Number Recognition (6–10)

Topic Code	NUR-NS-02
Domain	Number Sense
Subtopics	Recognizing numerals 6–10 • Saying number names • Building on 0–5 recognition
Concept Description	Children extend number recognition from 0–5 to 6–10, continuing to connect symbol and name.
Learning Outcomes	Children can recognize and name numbers 6–10 when shown.
Skills Developed	Number recognition, Visual discrimination, Vocabulary
Foundation (L1)	Point to a named number card from 6–10.
Application (L2)	Arrange three number cards from 6–10 in the order shown.
Challenge (L3)	Identify which number card from 6–10 is missing from a short row.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Matching
Question Bank Boundary — Should Test	Recognizing and naming numerals 6–10
Question Bank Boundary — Should NOT Test	Numbers beyond 10 or written number sentences

3. Matching Numbers with Quantities

Topic Code	NUR-NS-03
Domain	Number Sense
Subtopics	Matching a numeral to a picture group • Counting to check a match • Quantity as the meaning of a number
Concept Description	Children match a numeral to a picture group showing the same quantity, connecting symbols to real amounts.
Learning Outcomes	Children can match a numeral (0–10) to a picture group of the same quantity.
Skills Developed	Number-quantity correspondence, Counting, Visual matching
Foundation (L1)	Match a numeral to a picture group with the same small quantity (0–5).
Application (L2)	Match a numeral to a picture group with a larger quantity (6–10).
Challenge (L3)	Choose, from three picture groups, the one that does NOT match a given numeral.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Matching
Question Bank Boundary — Should Test	Matching numerals 0–10 to picture quantities
Question Bank Boundary — Should NOT Test	Numeral-quantity matching beyond 10

Domain: Counting

1. Counting Objects (1–5)

Topic Code	NUR-CO-01
Domain	Counting
Subtopics	Rote counting to 5 • Counting real or pictured objects • One-to-one correspondence (introductory)
Concept Description	Children count small groups of objects up to 5, touching or pointing to each one as they count.
Learning Outcomes	Children can count a group of up to 5 objects and state the total.
Skills Developed	Rote counting, One-to-one correspondence, Quantity awareness
Foundation (L1)	Count a row of up to 3 objects.
Application (L2)	Count a scattered group of up to 5 objects.
Challenge (L3)	Count a group of up to 5 objects where one or two look similar and could be miscounted.
Visual Priority	High
Recommended Question Types	Visual counting, Picture-based MCQ
Question Bank Boundary — Should Test	Counting groups of up to 5 objects
Question Bank Boundary — Should NOT Test	Counting beyond 5 or counting in groups of more than one

2. Counting Objects (6–10)

Topic Code	NUR-CO-02
Domain	Counting
Subtopics	Rote counting to 10 • Counting real or pictured objects • Keeping track while counting
Concept Description	Children extend counting to groups of up to 10 objects, keeping track of which have been counted.
Learning Outcomes	Children can count a group of up to 10 objects and state the total.
Skills Developed	Rote counting, One-to-one correspondence, Tracking
Foundation (L1)	Count a row of up to 8 objects.
Application (L2)	Count a scattered group of up to 10 objects.
Challenge (L3)	Count a group of up to 10 objects arranged in a way that makes tracking tricky (e.g. overlapping pictures).
Visual Priority	High
Recommended Question Types	Visual counting, Picture-based MCQ
Question Bank Boundary — Should Test	Counting groups of up to 10 objects
Question Bank Boundary — Should NOT Test	Counting beyond 10

3. One-to-One Correspondence

Topic Code	NUR-CO-03
Domain	Counting
Subtopics	Touching one object per number said • Matching objects in two rows • Avoiding double-counting
Concept Description	Children develop the understanding that each object counted corresponds to exactly one number word.
Learning Outcomes	Children can count a small group without skipping or double-counting any object.
Skills Developed	One-to-one correspondence, Attention, Self-checking
Foundation (L1)	Match objects in two short rows one-to-one to see which has more.
Application (L2)	Count a group of objects, touching each one exactly once.
Challenge (L3)	Spot a counting mistake in a short, already-counted row (e.g. an object touched twice).
Visual Priority	High
Recommended Question Types	Visual counting, Matching
Question Bank Boundary — Should Test	One-to-one matching and counting of small groups
Question Bank Boundary — Should NOT Test	Abstract counting without objects or pictures

Domain: Early Addition

1. Early Addition — Joining Groups

Topic Code	NUR-AD-01
Domain	Early Addition
Subtopics	Joining two small groups of objects • Adding one more • Finding how many altogether
Concept Description	Children use concrete objects to join two small groups and find the total, building the meaning of addition.
Learning Outcomes	Children can join two small groups of objects and count to find how many altogether.
Skills Developed	Concrete addition, Counting, Quantity combination
Foundation (L1)	Add one more object to a small group and count the new total.
Application (L2)	Join two small groups (each up to 4) and count the total.
Challenge (L3)	Choose the picture that shows the correct total after two groups are joined.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Visual counting
Question Bank Boundary — Should Test	Joining groups with a total up to 10, using objects or pictures
Question Bank Boundary — Should NOT Test	Written addition sentences or number facts without pictures

Domain: Early Subtraction

1. Early Subtraction — Taking Away

Topic Code	NUR-SU-01
Domain	Early Subtraction
Subtopics	Taking objects away from a group • Finding what remains • Visual before-and-after comparison
Concept Description	Children use concrete objects to take some away from a group and find how many remain.
Learning Outcomes	Children can take away objects from a small group and count how many remain.
Skills Developed	Concrete subtraction, Counting, Comparison
Foundation (L1)	Take one object away from a small group and count what remains.
Application (L2)	Take away several objects from a group of up to 8 and count what remains.
Challenge (L3)	Choose the picture that correctly shows what remains after some objects are removed.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Visual counting
Question Bank Boundary — Should Test	Taking away from groups of up to 10, using objects or pictures
Question Bank Boundary — Should NOT Test	Written subtraction sentences or number facts without pictures

Domain: Patterns

1. Simple Repeating Patterns (Color & Shape)

Topic Code	NUR-PA-01
Domain	Patterns
Subtopics	Recognizing an AB pattern • Identifying the repeating unit • Colour and shape patterns
Concept Description	Children recognize simple repeating patterns made of colours or shapes and identify the repeating unit.
Learning Outcomes	Children can recognize a simple AB repeating pattern and identify what repeats.
Skills Developed	Pattern recognition, Visual sequencing, Attention to detail
Foundation (L1)	Identify the two elements that repeat in a simple AB pattern.
Application (L2)	Recognize an ABB or AAB repeating pattern.
Challenge (L3)	Spot the one broken link in an otherwise repeating pattern.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Pattern completion
Question Bank Boundary — Should Test	Simple repeating patterns using colour and shape
Question Bank Boundary — Should NOT Test	Numeric or growing patterns

2. Continue the Pattern

Topic Code	NUR-PA-02
Domain	Patterns
Subtopics	Predicting the next element • Completing a pattern row • Choosing the correct continuation
Concept Description	Children predict and select the next element needed to continue a simple visual pattern.
Learning Outcomes	Children can choose the correct next element to continue a simple pattern.
Skills Developed	Pattern recognition, Prediction, Visual reasoning
Foundation (L1)	Continue a simple AB pattern by one more step.
Application (L2)	Continue a pattern by two or more steps.
Challenge (L3)	Choose the correct missing element from the middle of a pattern, not just the end.
Visual Priority	High
Recommended Question Types	Pattern completion, Picture-based MCQ
Question Bank Boundary — Should Test	Continuing simple repeating patterns
Question Bank Boundary — Should NOT Test	Patterns requiring numeric calculation

Domain: Shapes & Geometry

1. 2D Shape Recognition

Topic Code	NUR-SH-01
Domain	Shapes & Geometry

Subtopics	Circle, square, triangle, rectangle, oval • Naming shapes • Finding shapes in pictures
Concept Description	Children recognize and name common 2D shapes and find them within pictures and their surroundings.
Learning Outcomes	Children can recognize and name a circle, square, triangle, rectangle and oval.
Skills Developed	Shape recognition, Visual discrimination, Vocabulary
Foundation (L1)	Point to a named 2D shape among a small set.
Application (L2)	Find a named shape hidden within a busier picture.
Challenge (L3)	Identify which shape in a group does not match the others' shape family.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Matching
Question Bank Boundary — Should Test	Recognizing and naming the five core 2D shapes
Question Bank Boundary — Should NOT Test	Formal shape properties such as number of sides/angles by name

2. 3D Shape Recognition (Introductory)

Topic Code	NUR-SH-02
Domain	Shapes & Geometry
Subtopics	Cube, sphere, cone, cylinder • Naming shapes • Finding 3D shapes in everyday objects
Concept Description	Children recognize common 3D shapes and connect them to familiar everyday objects.
Learning Outcomes	Children can recognize a cube, sphere, cone and cylinder and match each to an everyday object.
Skills Developed	Shape recognition, Real-world connection, Vocabulary
Foundation (L1)	Point to a named 3D shape among a small set.
Application (L2)	Match a 3D shape to an everyday object that has that shape (e.g. a ball to a sphere).
Challenge (L3)	Identify which everyday object does NOT match a named 3D shape.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Matching
Question Bank Boundary — Should Test	Recognizing cube, sphere, cone and cylinder and matching to real objects
Question Bank Boundary — Should NOT Test	Formal properties such as faces, edges or vertices

3. Shapes in Everyday Objects

Topic Code	NUR-SH-03
Domain	Shapes & Geometry
Subtopics	Spotting shapes around us • Connecting shapes to objects • Shape hunts
Concept Description	Children identify 2D and 3D shapes within familiar everyday objects and surroundings.
Learning Outcomes	Children can identify the shape of a familiar everyday object.
Skills Developed	Shape recognition, Observation, Real-world connection

Foundation (L1)	Identify the shape of a single, clearly-shaped familiar object.
Application (L2)	Find all objects of a named shape within a picture scene.
Challenge (L3)	Identify an object in a scene whose shape has been disguised by its position or decoration.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Visual counting
Question Bank Boundary — Should Test	Identifying shapes of familiar, clearly-shaped objects
Question Bank Boundary — Should NOT Test	Objects with ambiguous or composite shapes

Domain: Spatial Awareness

1. Position Words (In/Out, Up/Down, Above/Below)

Topic Code	NUR-SP-01
Domain	Spatial Awareness
Subtopics	In/out • Up/down • Above/below • Over/under
Concept Description	Children use and understand basic position words to describe where an object is located.
Learning Outcomes	Children can identify or describe the position of an object using basic position words.
Skills Developed	Spatial vocabulary, Observation, Following instructions
Foundation (L1)	Point to the object that is 'in' or 'up' as described.
Application (L2)	Choose the picture matching a given position description (e.g. 'the ball is above the box').
Challenge (L3)	Describe the position of an object in an unfamiliar picture using the correct position word.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Position/direction
Question Bank Boundary — Should Test	Basic position word pairs: in/out, up/down, above/below, over/under
Question Bank Boundary — Should NOT Test	Coordinate-based or measured position descriptions

2. Direction & Simple Routes

Topic Code	NUR-SP-02
Domain	Spatial Awareness
Subtopics	Left/right (introductory) • Near/far • Following a simple picture route
Concept Description	Children begin to use directional language and follow a simple picture route from start to finish.
Learning Outcomes	Children can follow a simple picture route and describe an object's position using near/far.
Skills Developed	Directional vocabulary, Visual tracking, Sequencing
Foundation (L1)	Identify which of two objects is nearer or farther in a picture.
Application (L2)	Trace a simple route from a start point to an end point in a picture.
Challenge (L3)	Choose the correct path among two or three options that reaches a target in a picture maze.

Visual Priority	High
Recommended Question Types	Picture-based MCQ, Position/direction
Question Bank Boundary — Should Test	Near/far and simple single-path picture routes
Question Bank Boundary — Should NOT Test	Grid-based coordinates or multi-turn formal directions

Domain: Comparison

1. Size Comparison (Big/Small, Long/Short, Tall/Short)

Topic Code	NUR-CM-01
Domain	Comparison
Subtopics	Big/small • Long/short • Tall/short • Ordering by size
Concept Description	Children compare two or more objects by size, length or height using everyday comparison words.
Learning Outcomes	Children can identify which of two objects is bigger, longer or taller.
Skills Developed	Comparison, Visual estimation, Vocabulary
Foundation (L1)	Point to the bigger (or smaller) of two clearly different objects.
Application (L2)	Order three objects from shortest to tallest (or similar).
Challenge (L3)	Compare two objects whose size difference is subtle and requires careful looking.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Comparison
Question Bank Boundary — Should Test	Comparing two or three objects by size, length or height
Question Bank Boundary — Should NOT Test	Measurement using units or numbers

2. Quantity Comparison (More/Less, Same/Different)

Topic Code	NUR-CM-02
Domain	Comparison
Subtopics	More/less • Same/different • Equal quantities
Concept Description	Children compare two groups of objects to determine which has more, less, or whether they are the same.
Learning Outcomes	Children can identify which of two groups has more or less, or whether they are equal.
Skills Developed	Comparison, Counting, Visual matching
Foundation (L1)	Identify which of two clearly different-sized groups has more.
Application (L2)	Compare two groups with a close quantity difference by counting.
Challenge (L3)	Compare two groups arranged differently in space (e.g. spread out vs. clustered) without being misled by arrangement.
Visual Priority	High

Recommended Question Types	Picture-based MCQ, Comparison
Question Bank Boundary — Should Test	Comparing quantities of up to 10 using more/less/same
Question Bank Boundary — Should NOT Test	Numeric subtraction to find the difference

Domain: Sorting & Classification

1. Sorting by Colour & Shape

Topic Code	NUR-SO-01
Domain	Sorting & Classification
Subtopics	Sorting objects by colour • Sorting objects by shape • Explaining the sorting rule
Concept Description	Children sort a group of objects by a single property such as colour or shape.
Learning Outcomes	Children can sort a group of objects by colour or by shape.
Skills Developed	Classification, Observation, Rule-following
Foundation (L1)	Sort objects into two groups by an obvious colour difference.
Application (L2)	Sort objects into three or more groups by shape.
Challenge (L3)	Identify the sorting rule someone else used, given the sorted groups.
Visual Priority	High
Recommended Question Types	Sorting, Picture-based MCQ
Question Bank Boundary — Should Test	Sorting by a single property (colour or shape)
Question Bank Boundary — Should NOT Test	Sorting by two properties at once

2. Sorting by Size & Type

Topic Code	NUR-SO-02
Domain	Sorting & Classification
Subtopics	Sorting objects by size • Sorting objects by type (e.g. animals vs. toys) • Finding the odd one out
Concept Description	Children sort objects by size or by type, and identify an object that does not belong to a group.
Learning Outcomes	Children can sort objects by size or type and find the odd one out in a group.
Skills Developed	Classification, Observation, Reasoning
Foundation (L1)	Sort objects into big and small groups.
Application (L2)	Sort objects by type (e.g. fruits vs. vegetables).
Challenge (L3)	Find the one object that does not belong in an otherwise consistent group.
Visual Priority	High
Recommended Question Types	Sorting, Picture-based MCQ

Question Bank Boundary — Should Test	Sorting by size or type; finding an obvious odd one out
Question Bank Boundary — Should NOT Test	Multi-property sorting or classification with subtle exceptions

Domain: Measurement

1. Measurement Awareness (Length, Height, Weight)

Topic Code	NUR-ME-01
Domain	Measurement
Subtopics	Comparing lengths • Comparing heights • Heavy/light awareness • Non-standard units (introductory)
Concept Description	Children build early measurement awareness by comparing length, height and weight using everyday language.
Learning Outcomes	Children can compare two objects by length, height, or which feels heavier.
Skills Developed	Measurement awareness, Comparison, Estimation
Foundation (L1)	Identify which of two objects is longer or heavier by looking or a simple check.
Application (L2)	Compare three objects and order them by length or height.
Challenge (L3)	Estimate how many small objects (e.g. blocks) would match the length of a longer object, then check.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Comparison
Question Bank Boundary — Should Test	Comparing length, height and weight informally, non-standard unit estimation
Question Bank Boundary — Should NOT Test	Standard units (cm, kg) or measuring tools

Domain: Time

1. Everyday Time Concepts (Day/Night, Before/After)

Topic Code	NUR-TM-01
Domain	Time
Subtopics	Day and night • Morning and evening • Today, yesterday, tomorrow (introductory) • Before/after
Concept Description	Children recognize everyday time concepts such as day/night and the order of daily events.
Learning Outcomes	Children can identify whether a picture shows day or night and describe simple before/after order.
Skills Developed	Time vocabulary, Sequencing, Observation
Foundation (L1)	Identify whether a picture shows day or night.
Application (L2)	Put two or three everyday event pictures in the order they happen.
Challenge (L3)	Identify which of two events happens 'before' the other in an unfamiliar sequence.

Visual Priority	High
Recommended Question Types	Picture-based MCQ, Sequence
Question Bank Boundary — Should Test	Day/night, morning/evening, and simple before/after event ordering
Question Bank Boundary — Should NOT Test	Clock reading or calendar concepts

Domain: Money Awareness

1. Money Awareness — Recognizing & Matching

Topic Code	NUR-MO-01
Domain	Money Awareness
Subtopics	Recognizing coins/notes conceptually • Matching similar money pieces • Pretend shopping play
Concept Description	Children recognize that money comes in different forms and match similar coins or notes in play contexts.
Learning Outcomes	Children can match two identical coins or notes and engage in simple pretend shopping.
Skills Developed	Visual matching, Real-world awareness, Play-based learning
Foundation (L1)	Match two identical coins from a small set.
Application (L2)	Sort coins into groups that look the same.
Challenge (L3)	Identify the one coin in a group that is different from the rest.
Visual Priority	High
Recommended Question Types	Matching, Picture-based MCQ
Question Bank Boundary — Should Test	Recognizing and matching money conceptually, without values
Question Bank Boundary — Should NOT Test	Counting monetary value or handling real transactions

Domain: Data & Graphical Thinking

1. Simple Picture Sorting & Object Graphs

Topic Code	NUR-DT-01
Domain	Data & Graphical Thinking
Subtopics	Grouping objects by category • Building a simple object graph • Reading a picture graph
Concept Description	Children group objects into categories and represent them as a simple picture or object graph.
Learning Outcomes	Children can build a simple object graph and say which group has more or fewer.
Skills Developed	Data organization, Counting, Visual interpretation
Foundation (L1)	Group a small set of objects into two categories.
Application (L2)	Arrange grouped objects into a simple picture graph (one row per category).
Challenge (L3)	Read a completed simple picture graph to say which category has the most or fewest.

Visual Priority	High
Recommended Question Types	Picture-based MCQ, Data interpretation
Question Bank Boundary — Should Test	Simple two- or three-category picture/object graphs
Question Bank Boundary — Should NOT Test	Graphs with numeric axes or scales

Domain: Logical Reasoning

1. Odd One Out & Matching Puzzles

Topic Code	NUR-LR-01
Domain	Logical Reasoning
Subtopics	Finding the odd one out • Matching identical pictures • Simple visual puzzles
Concept Description	Children identify an item that does not belong in a group and match identical pictures in simple puzzles.
Learning Outcomes	Children can identify the odd one out in a small group and match identical pictures.
Skills Developed	Visual reasoning, Observation, Classification
Foundation (L1)	Find the odd one out where the difference is obvious (e.g. colour).
Application (L2)	Find the odd one out where the difference is more subtle (e.g. one small detail).
Challenge (L3)	Solve a puzzle requiring two matching pictures to be found among several similar distractors.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Simple logic puzzle
Question Bank Boundary — Should Test	Obvious and moderately subtle odd-one-out and matching puzzles
Question Bank Boundary — Should NOT Test	Puzzles requiring multi-step logical deduction

2. Sequencing — First, Last & What Comes Next

Topic Code	NUR-LR-02
Domain	Logical Reasoning
Subtopics	First and last • Ordering a short sequence • Predicting what comes next
Concept Description	Children order simple events or objects and predict what comes next in a short sequence.
Learning Outcomes	Children can identify the first and last item in a sequence and predict the next item.
Skills Developed	Sequencing, Prediction, Observation
Foundation (L1)	Identify the first or last item in a simple row.
Application (L2)	Order three to four pictures into a correct simple sequence.
Challenge (L3)	Predict the next picture in an unfamiliar short sequence based on a pattern of change.
Visual Priority	High

Recommended Question Types	Sequence, Picture-based MCQ
Question Bank Boundary — Should Test	First/last identification and ordering sequences of up to four items
Question Bank Boundary — Should NOT Test	Sequences requiring numeric reasoning

Markhor Junior Mathematics — Toddler Level — Kindergarten (KG)

Course Overview

Markhor Junior Mathematics — Toddler Level — Kindergarten (KG) builds fluently on Nursery foundations. Children extend number recognition to 20, begin conceptual addition and subtraction with number bonds, explore richer patterns and shape properties, and develop measurement, time and money awareness. Logical reasoning and simple problem solving become more independent, moving from Look-Think-Choose-Answer toward Understand-Think-Solve-Check, while remaining fully visual, play-based and age-appropriate throughout.

Mathematical Domains & Topics

Number Sense

- Numbers 0–20 Recognition
- Number Sequencing & Number Lines
- Number Before/After
- Number Comparison (Greater Than / Less Than)

Counting

- Counting Forward & Backward
- Counting in Simple Groups
- Odd/Even Awareness (Introductory)

Early Addition

- Addition within 10 — Counting On
- Number Bonds for Addition
- Picture-Based & Missing-Number Addition

Early Subtraction

- Subtraction within 10 — Counting Back
- Comparing Quantities via Subtraction
- Picture-Based & Missing-Number Subtraction

Number Bonds & Composition

- Making Numbers — Number Bonds
- Part-Part-Whole Relationships

Patterns

- Number Patterns
- Simple Growing Patterns

Shapes & Geometry

- 2D Shape Properties & Composition
- 3D Shape Properties
- Shape Puzzles & Shape Sorting

Spatial Awareness

- Position, Direction & Simple Routes (Advanced)

Comparison

- Multi-Attribute Comparison

Sorting & Classification

- Multi-Property Sorting & Classification

Measurement

- Comparing Measurements (Length, Weight, Capacity)
- Simple Standard Units & Estimation

Time

- Days of the Week & Months
- Clock Awareness — O'Clock
- Sequencing Daily Events & Duration

Money Awareness

- Recognizing Currency & Comparing Values
- Simple Buying & Change Concepts

Data & Graphical Thinking

- Picture Charts & Object Graphs
- Comparing Groups — Most/Least

Logical Reasoning

- Visual Puzzles & Classification
- Which Comes Next / Which Does Not Belong

Early Problem Solving

- Sharing & Comparing Quantities
- Understand–Think–Solve–Check Problems

Mental Mathematics

- Mental Maths — One More / One Less & Quick Bonds

Detailed Topic-by-Topic Curriculum — Kindergarten (KG)

Domain: Number Sense

1. Numbers 0–20 Recognition

Topic Code	KG-NS-01
Domain	Number Sense
Subtopics	Recognizing numerals 0–20 • Reading and naming numbers • Building on Nursery recognition
Concept Description	Children recognize and name numbers from 0 to 20, extending fluently beyond the Nursery range.
Learning Outcomes	Children can recognize and name any number from 0 to 20.
Skills Developed	Number recognition, Fluency, Vocabulary
Foundation (L1)	Point to a named number from 0–10.
Application (L2)	Point to a named number from 11–20.
Challenge (L3)	Identify a number shown in an unusual font, size or orientation.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Number recognition
Question Bank Boundary — Should Test	Recognizing and naming numbers 0–20
Question Bank Boundary — Should NOT Test	Numbers beyond 20 or place value notation

2. Number Sequencing & Number Lines

Topic Code	KG-NS-02
Domain	Number Sense
Subtopics	Ordering numbers 0–20 • Reading a number line • Placing a number on a number line
Concept Description	Children order numbers correctly and use a simple number line to locate and place numbers.
Learning Outcomes	Children can order a set of numbers and place a number correctly on a number line.
Skills Developed	Sequencing, Number line use, Spatial-numeric reasoning
Foundation (L1)	Order three numbers from smallest to largest (within 10).
Application (L2)	Place a given number correctly on a number line marked 0–20.
Challenge (L3)	Identify a wrongly-placed number on a number line and correct it.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Missing number
Question Bank Boundary — Should Test	Ordering and number-line placement for numbers 0–20
Question Bank Boundary — Should NOT Test	Negative numbers or number lines beyond 20

3. Number Before/After

Topic Code	KG-NS-03
Domain	Number Sense
Subtopics	Finding the number before • Finding the number after • Numbers between two given numbers
Concept Description	Children identify the number that comes immediately before or after a given number, and numbers between two others.
Learning Outcomes	Children can state the number immediately before or after a given number, within 20.
Skills Developed	Number sequencing, Recall, Reasoning
Foundation (L1)	State the number that comes after a given number (within 10).
Application (L2)	State the number that comes before a given number (within 20).
Challenge (L3)	Find the missing number that lies between two given numbers.
Visual Priority	Medium
Recommended Question Types	Missing number, Standard MCQ
Question Bank Boundary — Should Test	Before/after and between reasoning for numbers 0–20
Question Bank Boundary — Should NOT Test	Skip-counting by intervals other than one

4. Number Comparison (Greater Than / Less Than)

Topic Code	KG-NS-04
Domain	Number Sense
Subtopics	Comparing two numbers • Greater than / less than concepts • Using visual quantity to support comparison
Concept Description	Children compare two numbers to determine which is greater or less, supported by visual quantities.
Learning Outcomes	Children can identify which of two numbers (within 20) is greater or less.
Skills Developed	Number comparison, Reasoning, Visual support
Foundation (L1)	Compare two numbers with a picture showing their quantities.
Application (L2)	Compare two numbers (within 20) without picture support.
Challenge (L3)	Order three numbers from least to greatest, including two close in value.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Comparison
Question Bank Boundary — Should Test	Greater than/less than comparison for numbers 0–20
Question Bank Boundary — Should NOT Test	Formal inequality symbols ($>$, $<$) required for writing

Domain: Counting

1. Counting Forward & Backward

Topic Code	KG-CO-01
Domain	Counting
Subtopics	Counting forward to 20 • Counting backward from 10 • Counting on from a given number
Concept Description	Children count forward fluently to 20 and backward from 10, and count on from any given number.
Learning Outcomes	Children can count forward to 20 and backward from 10, and count on from a given number.
Skills Developed	Fluent counting, Sequencing, Mental tracking
Foundation (L1)	Count forward from 1 to 10.
Application (L2)	Count forward from 10 to 20, or backward from 10 to 1.
Challenge (L3)	Count on from a given number other than 1 (e.g. start at 6 and count to 12).
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Missing number
Question Bank Boundary — Should Test	Forward counting to 20 and backward counting from 10
Question Bank Boundary — Should NOT Test	Counting beyond 20 or skip counting

2. Counting in Simple Groups

Topic Code	KG-CO-02
Domain	Counting
Subtopics	Counting objects arranged in groups of 2 • Counting objects arranged in groups of 5 • Connecting grouping to total quantity
Concept Description	Children count objects arranged in small groups (of 2 or 5) to find a total, an early step toward multiplication.
Learning Outcomes	Children can count objects arranged in groups of 2 or 5 to find the total quantity.
Skills Developed	Group counting, Quantity awareness, Early multiplicative thinking
Foundation (L1)	Count objects arranged in pairs, up to 3 pairs.
Application (L2)	Count objects arranged in groups of 5, up to 2 groups.
Challenge (L3)	Find the total when groups are arranged unevenly (e.g. some groups of 2, one group of 1).
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Visual counting
Question Bank Boundary — Should Test	Counting objects grouped in 2s or 5s up to a total of 20
Question Bank Boundary — Should NOT Test	Formal multiplication facts or symbols

3. Odd/Even Awareness (Introductory)

Topic Code	KG-CO-03
Domain	Counting

Subtopics	Pairing objects to check for a leftover • Introductory odd/even language • Simple odd/even sorting
Concept Description	Children pair up objects to see whether one is left over, introducing odd and even informally.
Learning Outcomes	Children can determine, by pairing objects, whether a small group has an 'even' or 'odd' amount.
Skills Developed	Pairing, Early classification, Reasoning
Foundation (L1)	Pair up a small group of objects (up to 6) and see if any is left over.
Application (L2)	Sort several small numbers (within 10) as even or odd by pairing.
Challenge (L3)	Predict whether a given number will be odd or even before checking by pairing.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Sorting
Question Bank Boundary — Should Test	Informal odd/even awareness through pairing, numbers up to 10
Question Bank Boundary — Should NOT Test	Formal odd/even rules or numbers beyond 10

Domain: Early Addition

1. Addition within 10 — Counting On

Topic Code	KG-AD-01
Domain	Early Addition
Subtopics	Counting on from the larger number • Using fingers or objects to count on • Finding the total
Concept Description	Children add two numbers within 10 by counting on from the larger number, using objects or fingers as needed.
Learning Outcomes	Children can add two numbers within 10 using the counting-on strategy.
Skills Developed	Counting on, Mental strategy, Addition
Foundation (L1)	Add 1 to any number within 9 by counting on one step.
Application (L2)	Add two numbers within 10 by counting on two or three steps.
Challenge (L3)	Choose the correct total for an addition shown only as a picture, without counting aids.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Simple addition
Question Bank Boundary — Should Test	Addition within 10 using counting-on
Question Bank Boundary — Should NOT Test	Addition beyond 10 or written column addition

2. Number Bonds for Addition

Topic Code	KG-AD-02
Domain	Early Addition
Subtopics	Number bonds to 5 • Number bonds to 10 • Using bonds to add quickly

Concept Description	Children learn number bonds to 5 and 10 and use them to add quickly without recounting from one.
Learning Outcomes	Children can recall a number bond to 5 or 10 and use it to complete an addition.
Skills Developed	Number bonds, Recall, Mental addition
Foundation (L1)	Complete a number bond to 5 (e.g. 3 and ___ make 5).
Application (L2)	Complete a number bond to 10.
Challenge (L3)	Use a known number bond to quickly solve an addition presented differently (e.g. as a word problem).
Visual Priority	High
Recommended Question Types	Missing number, Picture-based MCQ
Question Bank Boundary — Should Test	Number bonds to 5 and 10
Question Bank Boundary — Should NOT Test	Number bonds beyond 10

3. Picture-Based & Missing-Number Addition

Topic Code	KG-AD-03
Domain	Early Addition
Subtopics	Addition shown with pictures • Missing-number addition sentences • Simple word problems
Concept Description	Children solve addition presented as pictures, missing-number sentences, and simple word problems.
Learning Outcomes	Children can solve a picture-based addition and a missing-number addition sentence within 10.
Skills Developed	Addition, Problem solving, Interpretation
Foundation (L1)	Solve a picture-based addition where both groups are visible.
Application (L2)	Solve a missing-number addition sentence (e.g. $4 + \underline{\quad} = 7$).
Challenge (L3)	Solve a simple one-step addition word problem using pictures or objects to support thinking.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Missing number, Word problem
Question Bank Boundary — Should Test	Picture-based and missing-number addition within 10; simple one-step word problems
Question Bank Boundary — Should NOT Test	Multi-step word problems or addition beyond 10

Domain: Early Subtraction

1. Subtraction within 10 — Counting Back

Topic Code	KG-SU-01
Domain	Early Subtraction
Subtopics	Counting back from a number • Using fingers or objects to count back • Finding what remains
Concept Description	Children subtract within 10 by counting back from the starting number, using objects as needed.

Learning Outcomes	Children can subtract within 10 using the counting-back strategy.
Skills Developed	Counting back, Mental strategy, Subtraction
Foundation (L1)	Subtract 1 from any number within 10 by counting back one step.
Application (L2)	Subtract within 10 by counting back two or three steps.
Challenge (L3)	Choose the correct result for a subtraction shown only as a picture, without counting aids.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Simple subtraction
Question Bank Boundary — Should Test	Subtraction within 10 using counting-back
Question Bank Boundary — Should NOT Test	Subtraction beyond 10 or written column subtraction

2. Comparing Quantities via Subtraction

Topic Code	KG-SU-02
Domain	Early Subtraction
Subtopics	Finding the difference between two groups • How many more / how many fewer • Visual comparison leading to subtraction
Concept Description	Children find the difference between two quantities using subtraction, connecting it to comparison language.
Learning Outcomes	Children can find how many more or fewer one group has than another, within 10.
Skills Developed	Comparison, Subtraction, Reasoning
Foundation (L1)	Find how many more one group has than a smaller group, using pictures.
Application (L2)	Find the difference between two groups without direct visual matching.
Challenge (L3)	Solve a 'how many fewer' problem where the smaller group is described rather than shown.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Comparison
Question Bank Boundary — Should Test	Finding differences between quantities within 10
Question Bank Boundary — Should NOT Test	Differences requiring numbers beyond 10

3. Picture-Based & Missing-Number Subtraction

Topic Code	KG-SU-03
Domain	Early Subtraction
Subtopics	Subtraction shown with pictures • Missing-number subtraction sentences • Simple word problems
Concept Description	Children solve subtraction presented as pictures, missing-number sentences, and simple word problems.
Learning Outcomes	Children can solve a picture-based subtraction and a missing-number subtraction sentence within 10.

Skills Developed	Subtraction, Problem solving, Interpretation
Foundation (L1)	Solve a picture-based subtraction where the starting group is visible.
Application (L2)	Solve a missing-number subtraction sentence (e.g. $9 - \underline{\quad} = 4$).
Challenge (L3)	Solve a simple one-step subtraction word problem using pictures or objects to support thinking.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Missing number, Word problem
Question Bank Boundary — Should Test	Picture-based and missing-number subtraction within 10; simple one-step word problems
Question Bank Boundary — Should NOT Test	Multi-step word problems or subtraction beyond 10

Domain: Number Bonds & Composition

1. Making Numbers — Number Bonds

Topic Code	KG-NB-01
Domain	Number Bonds & Composition
Subtopics	Ways to make a number • Number bond pairs • Visual number bond diagrams
Concept Description	Children explore the different ways a number can be made from two smaller parts, using visual number bond diagrams.
Learning Outcomes	Children can find two or more ways to make a given number (within 10) from two parts.
Skills Developed	Number composition, Flexible thinking, Representation
Foundation (L1)	Find one way to make a small number (within 5) from two parts.
Application (L2)	Find all the ways to make a number within 10 from two parts.
Challenge (L3)	Identify a missing part in a partially completed number bond diagram.
Visual Priority	High
Recommended Question Types	Missing number, Picture-based MCQ
Question Bank Boundary — Should Test	Number bonds and compositions for numbers up to 10
Question Bank Boundary — Should NOT Test	Number bonds for numbers beyond 10 or three-part bonds

2. Part-Part-Whole Relationships

Topic Code	KG-NB-02
Domain	Number Bonds & Composition
Subtopics	Understanding part-part-whole • Finding a missing part • Finding the whole given two parts
Concept Description	Children understand that a whole number can be split into two parts, and use this to find a missing part or the whole.
Learning Outcomes	Children can find a missing part or the whole in a part-part-whole diagram, within 10.
Skills Developed	Part-whole reasoning, Addition/subtraction connection, Visual representation

Foundation (L1)	Find the whole when given both parts.
Application (L2)	Find a missing part when given the whole and one part.
Challenge (L3)	Solve a part-part-whole problem presented as a short word problem rather than a diagram.
Visual Priority	High
Recommended Question Types	Missing number, Word problem
Question Bank Boundary — Should Test	Part-part-whole relationships for numbers up to 10
Question Bank Boundary — Should NOT Test	Part-whole relationships for numbers beyond 10

Domain: Patterns

1. Number Patterns

Topic Code	KG-PA-01
Domain	Patterns
Subtopics	Simple counting patterns • Patterns in a number sequence • Continuing a number pattern
Concept Description	Children recognize and continue simple patterns within a sequence of numbers.
Learning Outcomes	Children can recognize and continue a simple number pattern within 20.
Skills Developed	Pattern recognition, Number sequencing, Prediction
Foundation (L1)	Continue a simple counting-by-one number pattern.
Application (L2)	Continue a number pattern with a consistent gap other than one (e.g. 2, 4, 6, __).
Challenge (L3)	Identify the rule of an unfamiliar number pattern and use it to fill a gap in the middle.
Visual Priority	Medium
Recommended Question Types	Missing number, Standard MCQ
Question Bank Boundary — Should Test	Number patterns within 20 with a simple, consistent rule
Question Bank Boundary — Should NOT Test	Patterns requiring numbers beyond 20 or multiplication rules

2. Simple Growing Patterns

Topic Code	KG-PA-02
Domain	Patterns
Subtopics	Patterns that grow (e.g. 1, 2, 3 shapes) • Visual growing pattern sequences • Predicting the next stage
Concept Description	Children recognize simple visual growing patterns and predict the next stage in the sequence.
Learning Outcomes	Children can predict the next stage of a simple growing pattern.
Skills Developed	Pattern recognition, Prediction, Visual reasoning
Foundation (L1)	Continue a growing pattern by one more step, where the growth is obvious.
Application (L2)	Predict a growing pattern's next stage when the growth rule is slightly less obvious.

Challenge (L3)	Determine how many items would appear at a stage a little further along, without drawing every stage.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Pattern completion
Question Bank Boundary — Should Test	Simple visual growing patterns with an obvious growth rule
Question Bank Boundary — Should NOT Test	Growing patterns requiring algebraic or numeric formulas

Domain: Shapes & Geometry

1. 2D Shape Properties & Composition

Topic Code	KG-SH-01
Domain	Shapes & Geometry
Subtopics	Sides and corners (informal) • Combining shapes to make new shapes • Comparing shape properties
Concept Description	Children explore basic shape properties informally and combine simple shapes to compose new ones.
Learning Outcomes	Children can describe a simple shape property and combine two shapes to make a new one.
Skills Developed	Shape properties, Spatial composition, Reasoning
Foundation (L1)	Count the sides or corners of a simple shape.
Application (L2)	Combine two given shapes to make a new named shape (e.g. two triangles make a square).
Challenge (L3)	Identify which two shapes were combined to form a given composite shape.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Shape identification
Question Bank Boundary — Should Test	Informal side/corner counting and simple shape composition
Question Bank Boundary — Should NOT Test	Formal geometric terminology (vertices, formal angle names)

2. 3D Shape Properties

Topic Code	KG-SH-02
Domain	Shapes & Geometry
Subtopics	Rolling vs. stacking shapes • Flat vs. curved surfaces • Comparing 3D shapes
Concept Description	Children explore simple 3D shape properties such as whether a shape rolls, stacks, or has flat/curved surfaces.
Learning Outcomes	Children can describe whether a 3D shape rolls or stacks and has flat or curved surfaces.
Skills Developed	Shape properties, Observation, Comparison
Foundation (L1)	State whether a given 3D shape rolls or stacks.
Application (L2)	Sort a group of 3D shapes into those that roll and those that stack.

Challenge (L3)	Identify a 3D shape that can both roll and stack, and explain why.
Visual Priority	High
Recommended Question Types	Sorting, Picture-based MCQ
Question Bank Boundary — Should Test	Rolling/stacking and flat/curved surface awareness
Question Bank Boundary — Should NOT Test	Formal properties such as faces, edges or vertices by count

3. Shape Puzzles & Shape Sorting

Topic Code	KG-SH-03
Domain	Shapes & Geometry
Subtopics	Shape puzzle pieces • Sorting shapes by two properties • Fitting shapes into outlines
Concept Description	Children solve simple shape puzzles and sort shapes by more than one property.
Learning Outcomes	Children can fit a shape into a matching outline and sort shapes by two combined properties.
Skills Developed	Spatial reasoning, Classification, Problem solving
Foundation (L1)	Fit a single shape into its matching outline.
Application (L2)	Sort shapes by one property (e.g. shape) then a second (e.g. colour) within each group.
Challenge (L3)	Solve a puzzle requiring two or three shape pieces to be combined to fill an outline.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Sorting
Question Bank Boundary — Should Test	Shape-outline fitting and two-property sorting
Question Bank Boundary — Should NOT Test	Puzzles requiring rotation/reflection reasoning at a formal level

Domain: Spatial Awareness

1. Position, Direction & Simple Routes (Advanced)

Topic Code	KG-SP-01
Domain	Spatial Awareness
Subtopics	Left/right • Between and next to • Multi-step picture routes
Concept Description	Children use left/right and other position words confidently and follow routes with more than one step.
Learning Outcomes	Children can follow a multi-step picture route and correctly use left/right, between and next to.
Skills Developed	Directional vocabulary, Multi-step following, Spatial reasoning
Foundation (L1)	Identify what is to the left or right of a named object.
Application (L2)	Follow a two-step picture route to reach a target.
Challenge (L3)	Follow a three-step route including a change of direction, and identify the correct end point.
Visual Priority	High

Recommended Question Types	Picture-based MCQ, Position/direction
Question Bank Boundary — Should Test	Left/right, between/next to, and multi-step (up to 3) picture routes
Question Bank Boundary — Should NOT Test	Formal coordinate grids or compass directions

Domain: Comparison

1. Multi-Attribute Comparison

Topic Code	KG-CM-01
Domain	Comparison
Subtopics	Comparing by more than one attribute • Ranking three or more objects • Explaining a comparison
Concept Description	Children compare and rank objects using more than one attribute, such as size and colour together.
Learning Outcomes	Children can rank three or more objects by a stated attribute and explain the comparison.
Skills Developed	Comparison, Ranking, Communication
Foundation (L1)	Rank three objects by a single obvious attribute (e.g. height).
Application (L2)	Rank four or more objects by a stated attribute.
Challenge (L3)	Compare objects using two attributes at once (e.g. find the object that is both tall and red).
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Comparison
Question Bank Boundary — Should Test	Ranking three or more objects and comparing by two attributes
Question Bank Boundary — Should NOT Test	Comparison requiring measured numeric values

Domain: Sorting & Classification

1. Multi-Property Sorting & Classification

Topic Code	KG-SO-01
Domain	Sorting & Classification
Subtopics	Sorting by two properties at once • Explaining a classification rule • Venn-style grouping (introductory)
Concept Description	Children sort objects by two properties at once and begin simple Venn-style grouping.
Learning Outcomes	Children can sort a group of objects using two properties at once.
Skills Developed	Classification, Logical reasoning, Representation
Foundation (L1)	Sort objects by one property, then re-sort the same group by a second property.
Application (L2)	Sort objects into a simple two-circle grouping by two properties at once.
Challenge (L3)	Identify an object that belongs in the overlap of two groups in a simple Venn-style diagram.

Visual Priority	High
Recommended Question Types	Sorting, Picture-based MCQ
Question Bank Boundary — Should Test	Two-property sorting and introductory Venn-style grouping
Question Bank Boundary — Should NOT Test	Formal set notation or three-property sorting

Domain: Measurement

1. Comparing Measurements (Length, Weight, Capacity)

Topic Code	KG-ME-01
Domain	Measurement
Subtopics	Comparing lengths using a tool • Comparing weights with a balance • Comparing capacity (full/empty/half)
Concept Description	Children compare length, weight and capacity using simple tools and everyday comparison language.
Learning Outcomes	Children can compare two objects' length, weight or capacity using a simple comparison method.
Skills Developed	Measurement, Comparison, Tool use awareness
Foundation (L1)	Compare two containers by how full they are.
Application (L2)	Compare two objects' weight using a simple balance picture.
Challenge (L3)	Order three objects by length, weight, or capacity using indirect comparison (via a third object).
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Measurement comparison
Question Bank Boundary — Should Test	Direct and simple indirect comparison of length, weight and capacity
Question Bank Boundary — Should NOT Test	Measurement using standard numeric units

2. Simple Standard Units & Estimation

Topic Code	KG-ME-02
Domain	Measurement
Subtopics	Introductory awareness of standard units • Estimating using non-standard units • Checking an estimate
Concept Description	Children estimate a measurement using non-standard units and build introductory awareness of standard units.
Learning Outcomes	Children can estimate a length or quantity using non-standard units and check by counting.
Skills Developed	Estimation, Non-standard measurement, Checking
Foundation (L1)	Estimate how many small blocks would span a short object, then check.
Application (L2)	Estimate and check the capacity of a container using a small cup as the unit.

Challenge (L3)	Compare two estimates made with different non-standard units and discuss why they differ.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Measurement comparison
Question Bank Boundary — Should Test	Non-standard unit estimation and simple checking
Question Bank Boundary — Should NOT Test	Standard unit conversion or numeric unit calculations

Domain: Time

1. Days of the Week & Months

Topic Code	KG-TM-01
Domain	Time
Subtopics	Naming the days of the week in order • Awareness of months • Simple calendar awareness
Concept Description	Children learn the days of the week in order and build early awareness of months and calendars.
Learning Outcomes	Children can name the days of the week in order and recognize a simple calendar.
Skills Developed	Sequencing, Recall, Calendar awareness
Foundation (L1)	Name the day that comes after a given day of the week.
Application (L2)	Put the days of the week in order from a shuffled set.
Challenge (L3)	Identify how many days until a named day of the week, counting from today.
Visual Priority	Medium
Recommended Question Types	Sequence, Standard MCQ
Question Bank Boundary — Should Test	Days of the week in order; simple calendar recognition
Question Bank Boundary — Should NOT Test	Calculating dates across months or formal calendar arithmetic

2. Clock Awareness — O'Clock

Topic Code	KG-TM-02
Domain	Time
Subtopics	Reading o'clock times • Matching a clock to an activity • Hour hand awareness
Concept Description	Children read simple o'clock times on an analogue clock and match times to everyday activities.
Learning Outcomes	Children can read a simple o'clock time and match it to a described daily activity.
Skills Developed	Clock reading, Time awareness, Matching
Foundation (L1)	Identify the hour shown on a clock displaying an o'clock time.
Application (L2)	Match a given o'clock time to the activity that usually happens then.
Challenge (L3)	Identify which of two clocks shows the later o'clock time.
Visual Priority	High

Recommended Question Types	Clock recognition, Picture-based MCQ
Question Bank Boundary — Should Test	Reading o'clock times and matching to daily activities
Question Bank Boundary — Should NOT Test	Half-past, quarter-past or minute-level time reading

3. Sequencing Daily Events & Duration

Topic Code	KG-TM-03
Domain	Time
Subtopics	Ordering daily events • Simple duration concepts (longer/shorter) • Before/after with more steps
Concept Description	Children order a sequence of daily events and compare simple durations informally.
Learning Outcomes	Children can order four or more daily events and identify which of two activities takes longer.
Skills Developed	Sequencing, Duration awareness, Reasoning
Foundation (L1)	Order three daily events (e.g. wake up, eat breakfast, go to school).
Application (L2)	Order four or five daily events into a full simple routine.
Challenge (L3)	Compare two described activities and identify which likely takes longer, with reasoning.
Visual Priority	High
Recommended Question Types	Sequence, Picture-based MCQ
Question Bank Boundary — Should Test	Ordering daily routines and informal duration comparison
Question Bank Boundary — Should NOT Test	Duration measured in minutes or hours

Domain: Money Awareness

1. Recognizing Currency & Comparing Values

Topic Code	KG-MO-01
Domain	Money Awareness
Subtopics	Recognizing common coins/notes • Comparing which is worth more • Grouping money by type
Concept Description	Children recognize common currency and begin to compare which coin or note is worth more.
Learning Outcomes	Children can recognize common coins/notes and identify which of two is worth more.
Skills Developed	Currency recognition, Comparison, Real-world awareness
Foundation (L1)	Recognize and name a common coin or note.
Application (L2)	Identify which of two given coins/notes is worth more.
Challenge (L3)	Group a mixed set of coins/notes by value into matching piles.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Sorting

Question Bank Boundary — Should Test	Recognizing common currency and simple value comparison
Question Bank Boundary — Should NOT Test	Calculating totals or giving change

2. Simple Buying & Change Concepts

Topic Code	KG-MO-02
Domain	Money Awareness
Subtopics	Pretend buying with simple amounts • Counting simple amounts of money • Introductory change concept
Concept Description	Children engage in simple pretend buying situations, counting small amounts and beginning to understand change.
Learning Outcomes	Children can count a simple small amount of money and describe a basic buying situation.
Skills Developed	Counting money, Real-world application, Early reasoning
Foundation (L1)	Count a small group of identical coins to find the total number of coins.
Application (L2)	Determine if a given small amount is enough to 'buy' a pictured item at a stated simple price.
Challenge (L3)	Work out, in a simple pretend scenario, whether change would be needed and roughly how much.
Visual Priority	High
Recommended Question Types	Word problem, Picture-based MCQ
Question Bank Boundary — Should Test	Simple counting of money and buying scenarios within small amounts
Question Bank Boundary — Should NOT Test	Exact change calculation with multiple denominations

Domain: Data & Graphical Thinking

1. Picture Charts & Object Graphs

Topic Code	KG-DT-01
Domain	Data & Graphical Thinking
Subtopics	Building a picture chart from data • Reading a picture chart • Simple tables
Concept Description	Children build and read simple picture charts and tables representing categorical data.
Learning Outcomes	Children can build a simple picture chart from given information and read one to answer a question.
Skills Developed	Data representation, Interpretation, Counting
Foundation (L1)	Read a simple picture chart to state how many are in one category.
Application (L2)	Build a picture chart from a described or pictured data set.
Challenge (L3)	Use a picture chart to answer a comparison question (e.g. how many more are in one category than another).
Visual Priority	High

Recommended Question Types	Data interpretation, Picture-based MCQ
Question Bank Boundary — Should Test	Simple picture charts and tables with up to four categories
Question Bank Boundary — Should NOT Test	Bar graphs with numeric scales or axes

2. Comparing Groups — Most/Least

Topic Code	KG-DT-02
Domain	Data & Graphical Thinking
Subtopics	Identifying the group with the most • Identifying the group with the least • Ordering groups by size
Concept Description	Children compare several groups of objects or data to identify which has the most or least.
Learning Outcomes	Children can identify which of several groups has the most or the least.
Skills Developed	Comparison, Data interpretation, Counting
Foundation (L1)	Identify the group with the most from two clearly different groups.
Application (L2)	Order three or four groups from least to most.
Challenge (L3)	Identify the most and least from groups where the difference is subtle and requires careful counting.
Visual Priority	High
Recommended Question Types	Data interpretation, Comparison
Question Bank Boundary — Should Test	Most/least comparison across up to four groups
Question Bank Boundary — Should NOT Test	Comparison requiring calculated averages or totals

Domain: Logical Reasoning

1. Visual Puzzles & Classification

Topic Code	KG-LR-01
Domain	Logical Reasoning
Subtopics	Multi-step visual puzzles • Classification-based reasoning • Explaining a reasoning choice
Concept Description	Children solve visual puzzles requiring classification-based reasoning and explain their choice.
Learning Outcomes	Children can solve a visual puzzle requiring classification and briefly explain their reasoning.
Skills Developed	Visual reasoning, Classification, Communication
Foundation (L1)	Solve a puzzle with one clear classification rule.
Application (L2)	Solve a puzzle combining two classification rules.
Challenge (L3)	Solve an unfamiliar visual puzzle and explain, in simple words, why the chosen answer is correct.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Simple logic puzzle

Question Bank Boundary — Should Test	Classification-based visual puzzles with up to two combined rules
Question Bank Boundary — Should NOT Test	Puzzles requiring symbolic or numeric logic

2. Which Comes Next / Which Does Not Belong

Topic Code	KG-LR-02
Domain	Logical Reasoning
Subtopics	Predicting the next item in a sequence • Identifying the item that does not belong • Reasoning about relationships
Concept Description	Children predict the next item in a sequence and identify items that do not belong based on relationships.
Learning Outcomes	Children can predict the next item in an unfamiliar sequence and identify an item that does not belong.
Skills Developed	Pattern reasoning, Relationship recognition, Prediction
Foundation (L1)	Predict the next item in a simple, obvious sequence.
Application (L2)	Identify the item that does not belong based on a relationship (e.g. category, use).
Challenge (L3)	Predict the next item in a sequence where the rule is based on more than one changing feature.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Standard MCQ
Question Bank Boundary — Should Test	Sequence prediction and relationship-based odd-one-out reasoning
Question Bank Boundary — Should NOT Test	Sequences requiring numeric formulas

Domain: Early Problem Solving

1. Sharing & Comparing Quantities

Topic Code	KG-PS-01
Domain	Early Problem Solving
Subtopics	Sharing objects equally • Comparing shared amounts • Simple fair-share reasoning
Concept Description	Children share a group of objects equally between people and compare the resulting amounts.
Learning Outcomes	Children can share a small group of objects equally between two or three people.
Skills Developed	Sharing, Comparison, Early division reasoning
Foundation (L1)	Share a small group of objects equally between two people.
Application (L2)	Share a group of objects equally between three people.
Challenge (L3)	Determine whether a group can be shared equally among a given number of people, and if not, how many are left over.
Visual Priority	High
Recommended Question Types	Picture-based MCQ, Word problem

Question Bank Boundary — Should Test	Equal sharing among two or three people, within small quantities
Question Bank Boundary — Should NOT Test	Formal division notation or facts

2. Understand–Think–Solve–Check Problems

Topic Code	KG-PS-02
Domain	Early Problem Solving
Subtopics	Understanding a simple problem • Thinking of a strategy • Solving and checking the answer
Concept Description	Children apply a simple Understand-Think-Solve-Check process to solve short, everyday mathematics problems.
Learning Outcomes	Children can work through a short problem using an understand-think-solve-check approach.
Skills Developed	Problem solving, Self-checking, Strategic thinking
Foundation (L1)	Solve a one-step problem with strong picture support.
Application (L2)	Solve a one-step problem with a simple sentence and picture together.
Challenge (L3)	Solve an unfamiliar short problem requiring the child to choose their own strategy.
Visual Priority	High
Recommended Question Types	Word problem, Picture-based MCQ
Question Bank Boundary — Should Test	One-step problems using the understand-think-solve-check process
Question Bank Boundary — Should NOT Test	Multi-step problems requiring more than one operation

Domain: Mental Mathematics

1. Mental Maths — One More / One Less & Quick Bonds

Topic Code	KG-MM-01
Domain	Mental Mathematics
Subtopics	One more than a number • One less than a number • Quick recall of number bonds
Concept Description	Children mentally find one more or one less than a number and quickly recall known number bonds.
Learning Outcomes	Children can mentally state one more or one less than a number within 20, and recall a known bond quickly.
Skills Developed	Mental mathematics, Recall, Number sense
Foundation (L1)	State one more than a given number within 10.
Application (L2)	State one less than a given number within 20.
Challenge (L3)	Answer a quick mixed set of one-more/one-less and number-bond questions without counting aids.
Visual Priority	Medium
Recommended Question Types	Standard MCQ, Missing number

Question Bank Boundary — Should Test	Mental one-more/one-less and quick bond recall within 20
Question Bank Boundary — Should NOT Test	Mental mathematics under strict time pressure or beyond 20

10. Nursery → KG Progression Map

This gentle spiral progression map shows, for every domain, how KG builds fluently, independently and more flexibly on Nursery foundations, rather than simply repeating them. Number Bonds & Composition and Mental Mathematics begin only in KG, once children are developmentally ready.

Domain	Nursery Foundation	KG Development	KG Challenge
Number Sense	Recognize numbers 0–10 and match to quantities.	Recognize, sequence and compare numbers 0–20.	Solve visual missing-number and comparison puzzles.
Counting	Count small quantities (up to 10) using objects.	Count forward/backward to 20, count in groups of 2/5.	Solve visual counting problems with tricky arrangements.
Early Addition	Join small groups of objects using concrete objects.	Add within 10 using counting-on and number bonds.	Solve picture-based addition word problems.
Early Subtraction	Take away objects and find what remains.	Subtract within 10 using counting-back and comparison.	Solve picture-based subtraction word problems.
Number Bonds & Composition	(Not yet introduced — begins in KG.)	Explore ways to make numbers to 10; part-part-whole.	Find a missing part in an unfamiliar bond diagram.
Patterns	Recognize and continue simple repeating patterns.	Recognize number patterns and simple growing patterns.	Identify the rule of an unfamiliar pattern and extend it.
Shapes & Geometry	Recognize 2D/3D shapes and find them in objects.	Explore shape properties, composition and shape puzzles.	Solve puzzles combining shapes to fill an outline.
Spatial Awareness	Use basic position words and simple picture routes.	Use left/right and follow multi-step picture routes.	Follow a three-step route with a change of direction.
Comparison	Compare two objects by size or quantity.	Rank three or more objects; compare two attributes.	Compare using two attributes at once.
Sorting & Classification	Sort objects by a single property.	Sort by two properties; introductory Venn-style grouping.	Identify an item in the overlap of two groups.
Measurement	Compare length, height and weight informally.	Compare using simple tools; estimate with non-standard units.	Order objects using indirect comparison via a third object.
Time	Recognize day/night and simple before/after order.	Name days of the week, read o'clock times, order routines.	Compare durations of two described activities.
Money Awareness	Recognize and match money conceptually.	Recognize currency, compare values, simple buying scenarios.	Reason about whether change would be needed.
Data & Graphical Thinking	Sort objects into simple picture groups.	Build and read simple picture charts and tables.	Use a chart to answer a comparison question.
Logical Reasoning	Find the odd one out and simple sequencing.	Solve puzzles combining two classification rules.	Predict the next item in a multi-feature sequence.

Domain	Nursery Foundation	KG Development	KG Challenge
Early Problem Solving	(Introduced through Look-Think-Choose-Answer across domains.)	Apply Understand-Think-Solve-Check to one-step problems.	Solve an unfamiliar problem choosing its own strategy.
Mental Mathematics	(Not yet introduced — begins in KG.)	Find one more/one less; recall known number bonds quickly.	Answer a quick mixed set without counting aids.

11. MCQ Assessment Blueprint

Nursery weights Number Sense, Counting and Shapes most heavily, reflecting the earliest foundations of mathematical thinking. KG redistributes weight toward Addition, Subtraction and Number Bonds as operations are introduced, while Time and Money receive more weight as new KG-only domains.

Nursery — Domain Distribution

Mathematical Domain	% of Question Bank
Number Sense	14%
Counting	14%
Early Addition	5%
Early Subtraction	5%
Number Bonds & Composition	0%
Patterns	8%
Shapes & Geometry	12%
Spatial Awareness	8%
Comparison	8%
Sorting & Classification	8%
Measurement	4%
Time	3%
Money Awareness	3%
Data & Graphical Thinking	3%
Logical Reasoning	4%
Early Problem Solving	1%
Mental Mathematics	0%
Total	100%

KG — Domain Distribution

Mathematical Domain	% of Question Bank
Number Sense	10%
Counting	8%
Early Addition	9%
Early Subtraction	9%
Number Bonds & Composition	6%
Patterns	6%

Mathematical Domain	% of Question Bank
Shapes & Geometry	9%
Spatial Awareness	3%
Comparison	3%
Sorting & Classification	3%
Measurement	5%
Time	7%
Money Awareness	5%
Data & Graphical Thinking	5%
Logical Reasoning	5%
Early Problem Solving	5%
Mental Mathematics	2%
Total	100%

12. Difficulty Distribution

The Challenge component remains age-appropriate and reasoning-focused at both stages — never testing advanced mathematics, only careful thinking, observation and pattern recognition.

Nursery

Difficulty Level	% of Question Bank
Level 1 — Foundation	55%
Level 2 — Application	35%
Level 3 — Challenge	10%

KG

Difficulty Level	% of Question Bank
Level 1 — Foundation	40%
Level 2 — Application	42%
Level 3 — Challenge	18%

13. Future Question Bank Tagging System

Every Markhor Junior Toddler Level item should be tagged using the following standardised code, consistent with all later Markhor Junior levels and scalable to future assessments:

CLASS – DOMAIN – DIFFICULTY – TYPE – SEQUENCE

Example: KG-AD-A-VMCQ-009 → Kindergarten, Early Addition, Application, Visual MCQ, item 9.

Class Codes

Code	Meaning
NUR	Toddler Level — Nursery
KG	Toddler Level — Kindergarten

Domain Codes

Code	Meaning
NS	Number Sense
CO	Counting
AD	Early Addition
SU	Early Subtraction
NB	Number Bonds & Composition
PA	Patterns
SH	Shapes & Geometry
SP	Spatial Awareness
CM	Comparison
SO	Sorting & Classification
ME	Measurement
TM	Time
MO	Money Awareness
DT	Data & Graphical Thinking
LR	Logical Reasoning
PS	Early Problem Solving
MM	Mental Mathematics

Difficulty Codes

Code	Meaning
F	Foundation (Level 1)
A	Application (Level 2)
C	Challenge (Level 3)

Question Type Codes

Code	Meaning
VMCQ	Visual/picture-based multiple-choice question

Code	Meaning
CNT	Visual counting question
PAT	Pattern completion question
SHP	Shape identification question
MAT	Matching question
NUM	Number recognition question
MSN	Missing-number question
CMP	Comparison question
SRT	Sorting question
SEQ	Sequence question
ADD	Simple addition question
SUB	Simple subtraction question
POS	Position/direction question
MSC	Measurement comparison question
CLK	Clock recognition question
LOG	Simple logic puzzle
WRD	Simple word problem

14. Assessment Alignment

This curriculum is structured to directly support every future Markhor Junior Toddler Level product:

- Practice Activities — hands-on skill development and concept reinforcement through play, matching Foundation-level expectations for each topic.
- Practice Tests — age-appropriate visual mathematics practice, drawing mainly from Foundation and Application level items.
- Mock Tests — balanced, mixed-topic assessment following the Nursery or KG MCQ Assessment Blueprint distribution.
- Contest Paper — a fun, fair and developmentally appropriate assessment of early mathematical thinking, balancing all three difficulty levels as set out in Section 12.

15. Master Syllabus Table

A single reference table for teachers, curriculum managers, question writers and AI question-generation systems, for each stage. 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.

Nursery

Code	Domain	Topic	Foundation	Application	Challenge	Visual
NUR-NS-01	NS	Number Awareness & Recognition (0–5)	Point to a named number card from 0–5.	Match a number card to a picture with the same quantity.	Find a hidden or partly-covered number among 0–5 by its visible shape.	High
NUR-NS-02	NS	Number Recognition (6–10)	Point to a named number card from 6–10.	Arrange three number cards from 6–10 in the order shown.	Identify which number card from 6–10 is missing from a short row.	High
NUR-NS-03	NS	Matching Numbers with Quantities	Match a numeral to a picture group with the same small quantity (0–5).	Match a numeral to a picture group with a larger quantity (6–10).	Choose, from three picture groups, the one that does NOT match a given numeral.	High
NUR-CO-04	CO	Counting Objects (1–5)	Count a row of up to 3 objects.	Count a scattered group of up to 5 objects.	Count a group of up to 5 objects where one or two look similar and could be miscounted.	High
NUR-CO-05	CO	Counting Objects (6–10)	Count a row of up to 8 objects.	Count a scattered group of up to 10 objects.	Count a group of up to 10 objects arranged in a way that makes tracking tricky (e.g. overlapping pictures).	High
NUR-CO-06	CO	One-to-One Correspondence	Match objects in two short rows one-to-one to see which has more.	Count a group of objects, touching each one exactly once.	Spot a counting mistake in a short, already-counted row (e.g. an object touched twice).	High
NUR-AD-07	AD	Early Addition — Joining Groups	Add one more object to a small group and count the new total.	Join two small groups (each up to 4) and count the total.	Choose the picture that shows the correct total after two groups are joined.	High
NUR-SU-08	SU	Early Subtraction — Taking Away	Take one object away from a small group and count what remains.	Take away several objects from a group of up to 8 and count what remains.	Choose the picture that correctly shows what remains after some objects are removed.	High
NUR-PA-09	PA	Simple Repeating Patterns (Color & Shape)	Identify the two elements that repeat in a simple AB pattern.	Recognize an ABB or AAB repeating pattern.	Spot the one broken link in an otherwise repeating pattern.	High
NUR-PA-10	PA	Continue the Pattern	Continue a simple AB pattern by one more step.	Continue a pattern by two or more steps.	Choose the correct missing element from the middle of a pattern, not just the end.	High
NUR-SH-11	SH	2D Shape Recognition	Point to a named 2D shape among a small set.	Find a named shape hidden within a busier picture.	Identify which shape in a group does not match the others' shape family.	High
NUR-SH-12	SH	3D Shape Recognition (Introductory)	Point to a named 3D shape among a small set.	Match a 3D shape to an everyday object that has that shape (e.g. a ball to a sphere).	Identify which everyday object does NOT match a named 3D shape.	High
NUR-SH-13	SH	Shapes in Everyday Objects	Identify the shape of a single, clearly-shaped familiar object.	Find all objects of a named shape within a picture scene.	Identify an object in a scene whose shape has been disguised by its position or decoration.	High
NUR-SP-14	SP	Position Words (In/Out, Up/Down, Above/Below)	Point to the object that is 'in' or 'up' as described.	Choose the picture matching a given position description (e.g. 'the ball is above the box').	Describe the position of an object in an unfamiliar picture using the correct position word.	High
NUR-SP-15	SP	Direction & Simple Routes	Identify which of two objects is nearer or farther in a picture.	Trace a simple route from a start point to an end point in a picture.	Choose the correct path among two or three options that reaches a target in a picture maze.	High

Code	Domain	Topic	Foundation	Application	Challenge	Visual
NUR-CM-16	CM	Size Comparison (Big/Small, Long/Short, Tall/Short)	Point to the bigger (or smaller) of two clearly different objects.	Order three objects from shortest to tallest (or similar).	Compare two objects whose size difference is subtle and requires careful looking.	High
NUR-CM-17	CM	Quantity Comparison (More/Less, Same/Different)	Identify which of two clearly different-sized groups has more.	Compare two groups with a close quantity difference by counting.	Compare two groups arranged differently in space (e.g. spread out vs. clustered) without being misled by arrangement.	High
NUR-SO-18	SO	Sorting by Colour & Shape	Sort objects into two groups by an obvious colour difference.	Sort objects into three or more groups by shape.	Identify the sorting rule someone else used, given the sorted groups.	High
NUR-SO-19	SO	Sorting by Size & Type	Sort objects into big and small groups.	Sort objects by type (e.g. fruits vs. vegetables).	Find the one object that does not belong in an otherwise consistent group.	High
NUR-ME-20	ME	Measurement Awareness (Length, Height, Weight)	Identify which of two objects is longer or heavier by looking or a simple check.	Compare three objects and order them by length or height.	Estimate how many small objects (e.g. blocks) would match the length of a longer object, then check.	High
NUR-TM-21	TM	Everyday Time Concepts (Day/Night, Before/After)	Identify whether a picture shows day or night.	Put two or three everyday event pictures in the order they happen.	Identify which of two events happens 'before' the other in an unfamiliar sequence.	High
NUR-MO-22	MO	Money Awareness — Recognizing & Matching	Match two identical coins from a small set.	Sort coins into groups that look the same.	Identify the one coin in a group that is different from the rest.	High
NUR-DT-23	DT	Simple Picture Sorting & Object Graphs	Group a small set of objects into two categories.	Arrange grouped objects into a simple picture graph (one row per category).	Read a completed simple picture graph to say which category has the most or fewest.	High
NUR-LR-24	LR	Odd One Out & Matching Puzzles	Find the odd one out where the difference is obvious (e.g. colour).	Find the odd one out where the difference is more subtle (e.g. one small detail).	Solve a puzzle requiring two matching pictures to be found among several similar distractors.	High
NUR-LR-25	LR	Sequencing — First, Last & What Comes Next	Identify the first or last item in a simple row.	Order three to four pictures into a correct simple sequence.	Predict the next picture in an unfamiliar short sequence based on a pattern of change.	High

KG

Code	Domain	Topic	Foundation	Application	Challenge	Visual
KG-NS-01	NS	Numbers 0–20 Recognition	Point to a named number from 0–10.	Point to a named number from 11–20.	Identify a number shown in an unusual font, size or orientation.	High
KG-NS-02	NS	Number Sequencing & Number Lines	Order three numbers from smallest to largest (within 10).	Place a given number correctly on a number line marked 0–20.	Identify a wrongly-placed number on a number line and correct it.	High
KG-NS-03	NS	Number Before/After	State the number that comes after a given number (within 10).	State the number that comes before a given number (within 20).	Find the missing number that lies between two given numbers.	Medium
KG-NS-04	NS	Number Comparison (Greater Than / Less Than)	Compare two numbers with a picture showing their quantities.	Compare two numbers (within 20) without picture support.	Order three numbers from least to greatest, including two close in value.	Medium
KG-CO-05	CO	Counting Forward & Backward	Count forward from 1 to 10.	Count forward from 10 to 20, or backward from 10 to 1.	Count on from a given number other than 1 (e.g. start at 6 and count to 12).	Medium
KG-CO-06	CO	Counting in Simple Groups	Count objects arranged in pairs, up to 3 pairs.	Count objects arranged in groups of 5, up to 2 groups.	Find the total when groups are arranged unevenly (e.g. some groups of 2, one group of 1).	High
KG-CO-07	CO	Odd/Even Awareness (Introductory)	Pair up a small group of objects (up to 6) and see if any is left over.	Sort several small numbers (within 10) as even or odd by pairing.	Predict whether a given number will be odd or even before checking by pairing.	High
KG-AD-08	AD	Addition within 10 — Counting On	Add 1 to any number within 9 by counting on one step.	Add two numbers within 10 by counting on two or three steps.	Choose the correct total for an addition shown only as a picture, without counting aids.	High
KG-AD-09	AD	Number Bonds for Addition	Complete a number bond to 5 (e.g. 3 and ___ make 5).	Complete a number bond to 10.	Use a known number bond to quickly solve an addition presented differently (e.g. as a word problem).	High
KG-AD-10	AD	Picture-Based & Missing-Number Addition	Solve a picture-based addition where both groups are visible.	Solve a missing-number addition sentence (e.g. $4 + __ = 7$).	Solve a simple one-step addition word problem using pictures or objects to support thinking.	High
KG-SU-11	SU	Subtraction within 10 — Counting Back	Subtract 1 from any number within 10 by counting back one step.	Subtract within 10 by counting back two or three steps.	Choose the correct result for a subtraction shown only as a picture, without counting aids.	High
KG-SU-12	SU	Comparing Quantities via Subtraction	Find how many more one group has than a smaller group, using pictures.	Find the difference between two groups without direct visual matching.	Solve a 'how many fewer' problem where the smaller group is described rather than shown.	High
KG-SU-13	SU	Picture-Based & Missing-Number Subtraction	Solve a picture-based subtraction where the starting group is visible.	Solve a missing-number subtraction sentence (e.g. $9 - __ = 4$).	Solve a simple one-step subtraction word problem using pictures or objects to support thinking.	High
KG-NB-14	NB	Making Numbers — Number Bonds	Find one way to make a small number (within 5) from two parts.	Find all the ways to make a number within 10 from two parts.	Identify a missing part in a partially completed number bond diagram.	High
KG-NB-15	NB	Part-Part-Whole Relationships	Find the whole when given both parts.	Find a missing part when given the whole and one part.	Solve a part-part-whole problem presented as a short word problem rather than a diagram.	High
KG-PA-16	PA	Number Patterns	Continue a simple counting-by-one number pattern.	Continue a number pattern with a consistent gap other than one (e.g. 2, 4, 6, ___).	Identify the rule of an unfamiliar number pattern and use it to fill a gap in the middle.	Medium

Code	Domain	Topic	Foundation	Application	Challenge	Visual
KG-PA-17	PA	Simple Growing Patterns	Continue a growing pattern by one more step, where the growth is obvious.	Predict a growing pattern's next stage when the growth rule is slightly less obvious.	Determine how many items would appear at a stage a little further along, without drawing every stage.	High
KG-SH-18	SH	2D Shape Properties & Composition	Count the sides or corners of a simple shape.	Combine two given shapes to make a new named shape (e.g. two triangles make a square).	Identify which two shapes were combined to form a given composite shape.	High
KG-SH-19	SH	3D Shape Properties	State whether a given 3D shape rolls or stacks.	Sort a group of 3D shapes into those that roll and those that stack.	Identify a 3D shape that can both roll and stack, and explain why.	High
KG-SH-20	SH	Shape Puzzles & Shape Sorting	Fit a single shape into its matching outline.	Sort shapes by one property (e.g. shape) then a second (e.g. colour) within each group.	Solve a puzzle requiring two or three shape pieces to be combined to fill an outline.	High
KG-SP-21	SP	Position, Direction & Simple Routes (Advanced)	Identify what is to the left or right of a named object.	Follow a two-step picture route to reach a target.	Follow a three-step route including a change of direction, and identify the correct end point.	High
KG-CM-22	CM	Multi-Attribute Comparison	Rank three objects by a single obvious attribute (e.g. height).	Rank four or more objects by a stated attribute.	Compare objects using two attributes at once (e.g. find the object that is both tall and red).	High
KG-SO-23	SO	Multi-Property Sorting & Classification	Sort objects by one property, then re-sort the same group by a second property.	Sort objects into a simple two-circle grouping by two properties at once.	Identify an object that belongs in the overlap of two groups in a simple Venn-style diagram.	High
KG-ME-24	ME	Comparing Measurements (Length, Weight, Capacity)	Compare two containers by how full they are.	Compare two objects' weight using a simple balance picture.	Order three objects by length, weight, or capacity using indirect comparison (via a third object).	High
KG-ME-25	ME	Simple Standard Units & Estimation	Estimate how many small blocks would span a short object, then check.	Estimate and check the capacity of a container using a small cup as the unit.	Compare two estimates made with different non-standard units and discuss why they differ.	High
KG-TM-26	TM	Days of the Week & Months	Name the day that comes after a given day of the week.	Put the days of the week in order from a shuffled set.	Identify how many days until a named day of the week, counting from today.	Medium
KG-TM-27	TM	Clock Awareness — O'Clock	Identify the hour shown on a clock displaying an o'clock time.	Match a given o'clock time to the activity that usually happens then.	Identify which of two clocks shows the later o'clock time.	High
KG-TM-28	TM	Sequencing Daily Events & Duration	Order three daily events (e.g. wake up, eat breakfast, go to school).	Order four or five daily events into a full simple routine.	Compare two described activities and identify which likely takes longer, with reasoning.	High
KG-MO-29	MO	Recognizing Currency & Comparing Values	Recognize and name a common coin or note.	Identify which of two given coins/notes is worth more.	Group a mixed set of coins/notes by value into matching piles.	High
KG-MO-30	MO	Simple Buying & Change Concepts	Count a small group of identical coins to find the total number of coins.	Determine if a given small amount is enough to 'buy' a pictured item at a stated simple price.	Work out, in a simple pretend scenario, whether change would be needed and roughly how much.	High
KG-DT-31	DT	Picture Charts & Object Graphs	Read a simple picture chart to state how many are in one category.	Build a picture chart from a described or pictured data set.	Use a picture chart to answer a comparison question (e.g. how many more are in one category than another).	High
KG-DT-32	DT	Comparing Groups — Most/Least	Identify the group with the most from two clearly different groups.	Order three or four groups from least to most.	Identify the most and least from groups where the difference is subtle and requires careful counting.	High

Code	Domain	Topic	Foundation	Application	Challenge	Visual
KG-LR-33	LR	Visual Puzzles & Classification	Solve a puzzle with one clear classification rule.	Solve a puzzle combining two classification rules.	Solve an unfamiliar visual puzzle and explain, in simple words, why the chosen answer is correct.	High
KG-LR-34	LR	Which Comes Next / Which Does Not Belong	Predict the next item in a simple, obvious sequence.	Identify the item that does not belong based on a relationship (e.g. category, use).	Predict the next item in a sequence where the rule is based on more than one changing feature.	High
KG-PS-35	PS	Sharing & Comparing Quantities	Share a small group of objects equally between two people.	Share a group of objects equally between three people.	Determine whether a group can be shared equally among a given number of people, and if not, how many are left over.	High
KG-PS-36	PS	Understand–Think–Solve–Check Problems	Solve a one-step problem with strong picture support.	Solve a one-step problem with a simple sentence and picture together.	Solve an unfamiliar short problem requiring the child to choose their own strategy.	High
KG-MM-37	MM	Mental Maths — One More / One Less & Quick Bonds	State one more than a given number within 10.	State one less than a given number within 20.	Answer a quick mixed set of one-more/one-less and number-bond questions without counting aids.	Medium

16. Final Quality Control Summary

This curriculum has been reviewed against the following standards:

- Nursery is developmentally appropriate for early childhood learners.
- KG is clearly more advanced than Nursery, introducing operations, number bonds, and richer reasoning without repeating Nursery activities.
- The Toddler Level is clearly distinct from the Beginner Level (Class 1–2) in both content and format.
- No unnecessary repetition exists between Nursery and KG.
- Visual mathematics is strongly represented, with most topics rated High Visual Priority.
- Counting and number sense form the clear foundation of both stages.
- Addition and subtraction are introduced conceptually, using objects and pictures, never written algorithms.
- Shapes and spatial awareness are sufficiently represented at both stages.
- Patterns and logical reasoning are included and deepen from Nursery to KG.
- Measurement, time and money awareness are introduced appropriately, only from informal comparison in Nursery to simple standard-unit awareness in KG.
- Questions do not depend heavily on reading ability at either stage.
- Challenge questions test thinking, observation and pattern recognition rather than advanced mathematics.
- Every topic can generate age-appropriate questions and has clear testing boundaries.
- Learning outcomes are measurable and realistic for early childhood learners.
- The curriculum supports Practice Activities, Practice Tests, Mock Tests and Contest Papers.
- 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.
- The final website-ready overviews are concise and parent-friendly.
- The curriculum is scalable for all future Markhor Junior levels.