KINDERGARTEN MATHEMATICS

Scope & Sequence

Program Level: Kindergarten
Curriculum Area: Mathematics
Curriculum Components: Teacher Guide + Accompanying Student Book
Primary Focus: Number Sense • Counting & Quantity • Number Operations • Patterns • Geometry • Measurement • Comparison & Classification • Ordinal Numbers • Time • Money • Mathematical Reasoning

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EXECUTIVE OVERVIEW

Program Description

Kindergarten Mathematics develops early mathematical understanding through a combination of **hands-on exploration, explicit teacher modeling, mathematical language, movement, manipulatives, problem solving, Student Book practice, creative activities, and STEAM experiences**.

The curriculum begins with foundational concepts such as **zero, patterns, shapes, colors, numbers, matching, same and different, and counting sets**. It progressively extends children's mathematical thinking into number sequence, comparison, classification, logical reasoning, measurement, ordinal position, time, money, simple operations, and increasingly sophisticated number work.

Number learning develops from recognizing and representing individual quantities toward a broader understanding of the number system. Children work with **numerals, number words, quantities, sets, counting, number order, and written representation**, culminating in review of **0–20** and counting experiences extending to **100**.

The overall developmental progression can be summarized as:

Explore → Recognize → Name → Match → Count → Represent → Compare → Order → Measure → Operate → Apply → Reason → Review

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SCOPE AT A GLANCE

Strand	Curriculum Scope	Developmental Purpose
Number Sense & Numeration	0–20; number names; number words; quantities; multiple representations	Develop understanding of numbers as symbols representing quantities
Counting & Sets	Counting objects; matching quantities to numerals; constructing sets; counting sequence	Build one-to-one correspondence and cardinality
Number Order & Sequence	Number order, missing numbers, number paths, connect-the-dots, calendar numbers	Understand relationships within the counting sequence
Early Operations	Concrete and pictorial experiences involving simple addition	Introduce the idea that quantities can be combined
Comparison & Quantity	Same/different; more/less; greater/less; size comparisons	Develop relational mathematical thinking
Patterns	AB patterns, action patterns, color/shape patterns, continuing and missing patterns	Recognize, predict, extend and create repeating structures
Geometry & Shapes	Recognition, properties, comparison, construction and review of shapes	Develop visual-spatial and geometric reasoning
Measurement	Size, length, comparison, nonstandard measurement, centimeters and ruler use	Develop understanding that attributes can be compared and measured
Classification & Sorting	Grouping and classifying objects according to observable attributes	Develop organization and categorical reasoning
Ordinal Numbers	First through fifth	Understand position and order
Time & Calendar Concepts	Calendar experiences and telling time to the hour	Connect mathematical representation with everyday time
Money	Recognition and introductory relationships among coins	Introduce money as a practical mathematical system
Mathematical Reasoning	Visual perception, logical thinking, missing information, similarities and differences	Strengthen observation, inference and problem solving
Mathematical Language	Number, shape, size, position, comparison, measurement and quantity vocabulary	Enable children to communicate mathematical thinking

CURRICULUM DESIGN

Kindergarten Mathematics follows a recurring learning pathway:

Experience → Manipulate → Recognize → Name → Represent → Compare → Explain → Apply → Record → Review

Children move between:

Concrete Experience ↔ Mathematical Language ↔ Visual Representation ↔ Symbolic Representation

For example, number concepts are developed through:

Real Objects → Sets → Counting → Numeral → Number Word → Written Representation → Application

This progression supports children in connecting abstract mathematical symbols with quantities and experiences they can see, touch, move, count, compare and describe.

INSTRUCTIONAL APPROACH

Kindergarten Mathematics is:

Active • Concrete • Multisensory • Language-Rich • Cumulative • Play-Based • Application-Oriented

Instruction regularly integrates:

- real objects and manipulatives;
- teacher demonstration;
- songs, rhymes and stories;
- mathematical discussion;
- movement games;
- sorting and matching;
- classroom searches;
- puzzles and visual challenges;
- fine-motor activities;
- art and construction;
- science and STEAM experiences;
- Student Book practice; and
- learning centers.

TEACHER GUIDE + STUDENT BOOK

Teacher Guide

The Teacher Guide provides the experiential foundation through:

- modeling;
- questioning;
- manipulatives;
- stories and songs;
- mathematical games;
- movement;
- sorting;
- matching;
- counting;
- construction;
- experiments;
- art;
- collaborative activities;
- problem-solving experiences; and
- suggested learning centers.

Student Book

The Student Book provides opportunities for children to:

- identify;
- count;
- trace;
- write;
- match;
- circle;
- color;
- sort;
- compare;
- sequence;
- measure;
- complete patterns;
- record answers; and
- represent mathematical understanding pictorially and symbolically.

Intended Learning Cycle

Teacher Modeling → Concrete Exploration → Mathematical Talk → Guided Practice → Student-Book Application → Hands-On Reinforcement → Cumulative Review

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DETAILED SCOPE & SEQUENCE

STRAND 1 — NUMBER SENSE & NUMERATION

Scope

Number work develops from **zero through twenty**, with later cumulative experiences extending counting to **100**.

Children develop connections among:

Numeral ↔ Number Name ↔ Number Word ↔ Quantity ↔ Set ↔ Written Representation

Individual number lessons commonly ask children to:

- identify the numeral;
- say its name;
- recognize the corresponding number word;
- read the number word;
- trace and write the numeral;
- write or spell the number word;
- quantify the number;
- count corresponding objects;
- construct or identify sets; and
- represent the number through concrete materials.

For example, the Number 19 lesson requires children to identify **19**, recognize and read *nineteen*, write and spell the word, trace and write the numeral, quantify 19, and count and collect 19 objects.

Developmental Progression

Recognize Numeral → Name Numeral → Count Quantity → Match Set → Recognize Number Word → Represent Quantity → Trace → Write → Retrieve & Apply

STRAND 2 — ZERO & THE CONCEPT OF EMPTY SETS

Kindergarten Mathematics explicitly begins with **zero**.

Children learn to:

- identify numeral 0;
- say *zero*;
- recognize the word *zero*;
- write and spell *zero*;
- trace and write 0;
- identify empty sets;
- understand that no objects can be represented by zero; and
- compare sets that include zero.

This provides an important conceptual starting point for subsequent number work.

STRAND 3 — COUNTING & QUANTITY

Children develop increasingly reliable counting skills using real objects, pictures, movement, dice, manipulatives and written activities.

They practice:

- one-to-one counting;
- counting objects in sets;
- identifying how many objects are present;
- matching sets to numerals;
- constructing a requested quantity;
- drawing specified quantities;
- matching quantities with number words;
- counting through movement;
- and counting within progressively larger number ranges.

Early set activities focus on smaller quantities. For example, children count sets and match them with numbers and create sets through drawing and manipulatives.

Later work consolidates **0–20** and introduces counting through **100**.

Progression

Count Small Sets → Match Set to Numeral → Construct Set → Record Quantity → Count Larger Sets → Retrieve Number Sequence → Extend Counting Range

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STRAND 4 — NUMBER WORDS & MATHEMATICAL SYMBOLS

Number instruction deliberately connects symbolic and written representations.

Children encounter:

They practice:

- recognizing number words;
- reading familiar number words;
- matching number words with numerals;
- arranging letters to create number words;
- tracing number words;
- writing number words; and
- connecting numeral, word and quantity.

The cumulative number review asks children to trace numbers and number words **0–20** and read number-word flashcards aloud.

STRAND 5 — NUMBER ORDER & SEQUENCE

Children develop understanding that numbers occur in a predictable sequence.

Experiences include:

- arranging numbers in order;
- counting forward;
- identifying missing numbers;
- completing number paths;
- connecting numbered dots;
- ordering numbered objects;

- calendar number activities; and
- writing number sequences.

A dedicated Number Orders lesson requires children to trace and write **1–10**, count objects, connect dots in numerical order, and arrange toys from 1 through 10.

Later cumulative activities extend ordered number experiences through **0–20**.

Progression

Recite → Recognize → Arrange → Complete Missing Numbers → Connect in Sequence → Write Sequence → Apply Sequence

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STRAND 6 — EARLY NUMBER OPERATIONS

Kindergarten Mathematics introduces children to the idea that quantities can be combined through concrete and playful mathematical experiences.

Children encounter simple addition through:

- manipulatives;
- pictures;
- number combinations;
- teacher demonstrations;
- mathematical games; and
- simple written sums.

The Teacher Guide includes active practice in which children solve simple addition sums written on a beach ball while participating in a class catching game.

The emphasis remains on developing meaning through concrete and visual experiences rather than treating operations only as abstract written procedures.

Conceptual Progression

Concrete Quantities → Combine Groups → Count Total → Represent Combination → Respond to Simple Addition

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STRAND 7 — COMPARISON & QUANTITATIVE RELATIONSHIPS

Children learn that mathematical objects and quantities can be compared.

Concepts include:

- same and different;
- more and less;
- greater and less;
- small, medium and large;
- longer and shorter;
- taller and shorter;
- matching quantities; and
- comparing numbers.

The guide explicitly introduces **greater than/less than and more/less**, including identifying numbers greater or less than ten and comparing two numbers or quantities.

Progression

Notice Difference → Match Same → Compare Objects → Compare Sets → Compare Size → Compare Number → Use Comparative Language

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STRAND 8 — PATTERNS

Patterning progresses from recognizing simple repetition toward predicting, continuing, constructing and completing patterns.

Children experience:

- AB patterns;
- action patterns;
- movement patterns;
- clapping patterns;
- color patterns;
- object patterns;
- shape patterns;
- missing-pattern activities; and
- creative pattern construction.

Early instruction defines a pattern as a design that repeats and asks children to determine **what comes next**.

Later experiences ask children to observe and continue patterns and reproduce rhythmic sequences through clapping and movement.

Developmental Progression

Notice Repetition → Copy → Predict What Comes Next → Continue → Identify Missing Element → Create Pattern

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STRAND 9 — GEOMETRY & SHAPE

Children investigate geometric shapes through recognition, language, tracing, sorting, construction and real-world application.

Shape instruction includes experiences with forms such as:

Circle • Square • Triangle • Rectangle • Star and other shapes represented within the guide

Children learn to:

- identify shapes;
- name shapes;
- recognize shape words;
- trace shapes;
- identify shapes within pictures;
- locate shapes in the environment;
- sort geometric forms;
- count sides and corners where introduced;
- compare shapes;
- construct shapes using materials; and
- create artwork using shapes.

For example, square instruction explicitly introduces **four sides and four corners**, while rectangle instruction asks children to differentiate a rectangle from a square.

The curriculum concludes with a dedicated shape-review lesson requiring children to identify different shapes in a picture and count circles, squares, rectangles and triangles.

Progression

Recognize → Name → Trace → Describe → Sort → Compare → Construct → Find in Environment → Apply → Review

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STRAND 10 — COLORS, MATCHING & ATTRIBUTE RECOGNITION

Color experiences are integrated into mathematical classification, matching, vocabulary and pattern work.

Children learn to:

- identify colors;
- name colors;
- recognize color words;
- find objects of a specified color;
- match same-colored objects;
- trace and write color words;
- sort according to color;
- use color in patterns; and
- explore selected color-mixing experiences.

For example, the guide introduces orange through familiar objects and includes mixing **red and yellow** paints to create orange.

Color therefore functions not only as vocabulary but also as an observable attribute children can use for mathematical organization.

STRAND 11 — SORTING & CLASSIFICATION

Children classify objects and experiences according to observable characteristics.

Classification may involve:

- color;
- shape;
- size;
- quantity;

- visual characteristics;
- category;
- sound;
- similarity and difference; and
- other observable attributes.

The curriculum eventually asks children to classify contrasting properties such as **quiet and loud**, demonstrating that classification extends beyond purely visual characteristics.

Progression

Observe Attribute → Match → Separate → Group → Classify → Explain Classification

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STRAND 12 — VISUAL PERCEPTION & LOGICAL THINKING

Mathematics is also used to strengthen children's observation, reasoning and problem-solving abilities.

Children work with activities requiring them to:

- determine which objects belong together;
- distinguish indoor and outdoor situations;
- interpret clues;
- assemble puzzles;
- find hidden objects;
- identify unusual elements;
- determine what is missing;
- compare pictures; and
- identify differences.

A dedicated Visual Perception and Logical Thinking lesson asks children to draw conclusions from clues, arrange puzzle pieces, identify objects that belong together, and locate unusual or hidden objects.

Reasoning Progression

Observe → Compare → Notice Relationship → Identify Difference → Find Missing Information → Infer → Explain

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STRAND 13 — MEASUREMENT & SIZE

Measurement progresses from informal comparison toward use of a standard measuring tool.

Children encounter:

- small, medium and large;
- longer and shorter;
- taller and shorter;
- direct comparison;
- nonstandard measurement;
- ruler use;
- centimeters; and
- recording length.

Before formal measurement, children compare objects directly.

They then measure using objects such as blocks before being introduced to rulers and centimeters.

The guide explicitly asks children to identify centimeter markings, explain the use of a ruler, measure objects in centimeters, and compare measurements.

A subsequent lesson develops ruler use further by asking children to determine object lengths and measure classroom objects.

Developmental Progression

Compare Visually → Order by Size/Length → Measure with Nonstandard Units → Introduce Ruler → Recognize Centimeters → Measure & Record Length

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STRAND 14 — ORDINAL NUMBERS

Children are introduced to ordinal position through:

First • Second • Third • Fourth • Fifth

They learn to:

- identify ordinal words;
- identify positions within a row;
- follow positional instructions;

- connect ordinal language with order;
- locate hidden objects according to ordinal position; and
- apply ordinal vocabulary during races and movement activities.

The Teacher Guide explicitly connects the words with their symbolic forms:

1st • 2nd • 3rd • 4th • 5th.

Progression

Physical Position → Spoken Ordinal Word → Visual Position → Ordinal Symbol → Application

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STRAND 15 — TIME & CALENDAR CONCEPTS

Children encounter time as a meaningful everyday mathematical system.

The curriculum includes:

- calendar use;
- days and dates;
- days of the week;
- months of the year; and
- telling time to the hour.

Calendar concepts are reinforced during cumulative number review, where children identify the current day and date, review days and months, and complete missing calendar numbers.

The Teacher Guide also contains a dedicated **Telling Time to the Hour** lesson.

Conceptual Progression

Daily Routine → Calendar Awareness → Day/Date → Calendar Number Sequence → Clock Awareness → Time to the Hour

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STRAND 16 — MONEY

Kindergarten Mathematics introduces money through concrete experiences with coins.

Children explore:

- recognizing coins;
- observing physical coin characteristics;
- comparing coins;
- introductory coin values and relationships;
- using coins in hands-on activities; and
- connecting money with familiar real-world contexts.

The Teacher Guide includes, for example, a coin-rubbing activity in which children explore the relationship between **five pennies and one nickel**.

At this level, money functions primarily as an introductory practical mathematics experience.

STRAND 17 — MATHEMATICAL LANGUAGE & COMMUNICATION

Mathematical vocabulary is intentionally embedded throughout the program.

Children use language such as:

zero • set • same • different • pattern • next • circle • square • triangle • rectangle • side • corner • number • more • less • greater • small • medium • large • long • short • centimeter • first • second • third • fourth • fifth

Teachers frequently encourage children to respond in complete sentences.

Examples include:

“I see one ____.”

“This is a circle.”

“The ____ has a circle shape.”

“The pencil is eight centimeters long.”

Mathematical learning therefore develops alongside oral language and the ability to describe observations and reasoning.

STRAND 18 — MATHEMATICAL REPRESENTATION & RECORDING

Children increasingly represent mathematical ideas through marks, pictures, numerals and words.

Experiences include:

- tracing;
- numeral writing;
- number-word writing;
- drawing quantities;
- circling answers;
- matching with lines;
- completing patterns;
- recording measurements;
- writing missing numbers;
- completing calendars; and
- recording counted quantities.

The developmental movement is:

Manipulate → Draw → Trace → Match → Write → Record

This helps bridge concrete mathematical experience and symbolic mathematics.

CUMULATIVE NUMBER PROGRESSION

Stage 1 — Foundational Number Concepts

Children establish:

Zero • Small Quantities • Numeral Recognition • Counting • Sets • Numeral Formation

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Stage 2 — Numbers 1–10

Children increasingly connect:

Numeral ↔ Quantity ↔ Number Word ↔ Written Form

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Stage 3 — Number Relationships

Children work with:

Order • Sequence • Sets • More/Less • Greater/Less • Comparison

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Stage 4 — Numbers Beyond 10

The same number relationships expand into the teen numbers and ultimately **20**.

The Number 20 lesson requires children to identify 20, recognize and read *twenty*, write and spell the number word, write and trace the numeral, quantify 20, and count associated objects.

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Stage 5 — Cumulative 0–20 Review

Children review:

- numerals;
- number words;
- writing;
- number order;
- sets;
- counting; and
- numeral-to-word matching.

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Stage 6 — Counting Extension to 100

Children practice counting **1–100**, examine patterns within the number sequence, and encounter decade numbers through 100.

CROSS-DEVELOPMENTAL INTEGRATION

Developmental Area	Mathematics Connections
Cognitive Development	Counting, matching, classification, sequencing, comparison, reasoning and problem solving
Language Arts	Number words, shape words, mathematical vocabulary, discussion and complete-sentence responses
Fine-Motor Development	Tracing, writing, cutting, gluing, sorting, building and manipulating objects
Gross-Motor Development	Number jumping, giant shapes, movement patterns, races, classroom hunts and measurement activities
STEAM	Measurement, construction, patterning, experiments, geometric design and mathematical investigation
Creative Arts	Number art, shape construction, color exploration, collage, painting and pattern design
Social-Emotional Development	Cooperative games, partner activities, turn-taking, teamwork and classroom discussion
Sensory Development	Tactile numerals, sand, playdough, manipulatives, textures and movement
Critical Thinking	Comparison, prediction, missing information, logical relationships and problem solving

TEACHING & LEARNING ENVIRONMENT

Mathematics Center

Numerals, counters, dice, number cards, matching games, number words and quantity activities.

Manipulatives & Sorting Center

Blocks, counters, buttons, beads, shapes, containers and classification materials.

Geometry Center

Shape blocks, puzzles, construction materials and shape-sorting experiences.

Measurement Center

Rulers, blocks, classroom objects, ribbons and comparative measurement activities.

Pattern Center

Beads, blocks, colored objects, shapes and missing-pattern activities.

Writing & Recording Center

Number tracing, number words, mathematical worksheets and dry-erase practice.

Sensory Mathematics

Sand writing, playdough numerals, tactile counting materials and object collections.

Movement Mathematics

Number paths, hopscotch, giant numerals, shape walks, movement patterns and mathematical games.

OBSERVABLE EVIDENCE OF LEARNING

Teachers can observe whether children increasingly:

- recognize and name numerals;
- connect numerals with quantities;
- count objects using one-to-one correspondence;
- identify how many objects are in a set;
- construct a requested set;
- recognize familiar number words;
- trace and write numerals;
- write or reproduce number words;
- arrange numbers in sequence;
- identify missing numbers;
- compare two quantities;
- use more/less and greater/less language appropriately;
- identify, name and compare shapes;
- recognize basic shape properties introduced in the guide;
- sort and classify according to attributes;
- recognize, continue and create patterns;

- compare objects according to size and length;
- use a ruler for introductory measurement;
- recognize centimeters as a unit introduced in the curriculum;
- identify ordinal positions first through fifth;
- engage with calendar concepts;
- tell time to the hour within taught activities;
- participate in introductory money experiences;
- respond to simple addition experiences;
- explain observations using mathematical vocabulary; and
- apply mathematical knowledge during games and practical activities.

These behaviors provide observable evidence of developing mathematical understanding rather than functioning as rigid pass/fail criteria.

END-OF-BOOK LEARNING PROFILE

By completion of Kindergarten Mathematics, children have been provided with opportunities to develop the following mathematical foundations.

Number Sense

Recognize, represent, read, trace, write and quantify numbers through **20**, with counting experiences extending to **100**.

Counting & Sets

Count objects, construct sets, match quantities to numerals and use counting to determine how many.

Number Representation

Connect numerals with number names, number words, quantities and pictorial representations.

Number Order

Sequence numbers and apply number order during games, connect-the-dot activities, calendars and cumulative review.

Early Operations

Participate in concrete, visual and playful experiences involving simple addition.

Comparison

Compare objects, numbers and quantities using concepts including same/different, more/less, greater/less and size relationships.

Patterning

Recognize, continue, predict, complete and create repeating patterns.

Geometry

Recognize, name, trace, compare, sort and construct shapes and identify shapes within the environment.

Measurement

Compare size and length, experience nonstandard measurement, use a ruler and measure selected objects in centimeters.

Classification

Sort and classify objects according to observable attributes.

Ordinal Understanding

Identify and apply first through fifth.

Time

Engage with calendars, days, dates and telling time to the hour.

Money

Participate in introductory coin recognition, comparison and value relationships.

Mathematical Reasoning

Observe, compare, predict, classify, identify missing information and solve age-appropriate mathematical problems.

Mathematical Communication

Use increasingly precise mathematical vocabulary to describe quantities, patterns, shapes, positions, comparisons and measurements.

CURRICULUM OUTCOME STATEMENT

Kindergarten Mathematics develops children's ability to understand mathematics as a system for **counting, representing, comparing, ordering, measuring, classifying, patterning and solving problems**.

Through teacher modeling, concrete materials, mathematical discussion, movement, games, stories, songs, art, STEAM investigations, learning centers and Student Book practice, children repeatedly connect:

what they experience → what they notice → what they say → what they represent → what they record → what they reason

The curriculum progresses from foundational number, shape, color and pattern experiences toward increasingly formal mathematical representations involving **numbers through 20, number words, sets, number relationships, measurement, ordinal position, time, money and introductory operations**, while extending counting experiences to **100**.

PROGRAM CONTINUITY

Kindergarten Mathematics represents the culminating level of the three-stage early mathematics program.

NURSERY MATHEMATICS

Experience → Recognize → Name → Match → Count → Trace

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PRESCHOOL MATHEMATICS

Recognize → Count → Match → Sort → Compare → Sequence → Represent

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KINDERGARTEN MATHEMATICS

Represent → Compare → Order → Measure → Operate → Apply → Reason → Record

Across the complete series, the mathematical continuum can therefore be documented through:

Number Sense • Counting & Quantity • Number Representation • Patterns • Geometry • Classification • Comparison • Mathematical Language • Measurement • Operations • Time • Money • Mathematical Reasoning

The final three-book mathematics Scope & Sequence should show where each concept is **Introduced → Developed → Consolidated** across Nursery, Preschool and Kindergarten.