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Comparison of K5 Learning and NY State Math Topics (Kindergarten & Grade 1)

This report compares the math topics offered by **K5 Learning** for kindergarten and grade 1 with the **New York State Next Generation Mathematics Learning Standards**. It identifies gaps—topics required by NY standards but not explicitly covered by K5—and presents consolidated topic lists for each grade.

Method

1. **K5 topics** – extracted from K5 Learning's kindergarten and grade 1 math sections (numbers & counting, simple math, measurement, money, graphing, addition, subtraction, shapes, etc.).
2. **NY State standards** – gathered from the New York State Education Department's crosswalk documents for kindergarten and grade 1. These crosswalks list the next-generation standards and provide notes on counting, operations, measurement, data and geometry【828368488485818†L150-L321】 [1].
3. **Cross-check** – topics present in NY standards but missing or less emphasised on K5 were marked as "additional topics."

Kindergarten comparison

Topics covered by K5

K5's kindergarten math program focuses on these concepts:

- **Numbers and counting** – recognizing and writing numbers 1–20; counting objects and comparing them (more/less); odd/even numbers; ordinal numbers [2].
- **Patterns** – recognizing and extending simple patterns with shapes and colours [3].
- **Measurement** – comparing lengths and heights using non-standard units; measuring with simple scales and rulers; comparing size, weight and capacity [4].
- **Money** – identifying and counting coins (pennies, nickels, dimes, quarters); matching coins to their names and values; sorting and counting coins [5].
- **Graphing** – reading and creating bar charts; sorting objects and answering questions about bar graphs [6].
- **Addition and subtraction** – adding and subtracting small numbers (to 20) using objects, pictures, number lines and simple equations [7] [8].
- **Shapes & geometry** – tracing, drawing and naming 2-D shapes; identifying 2-D vs 3-D shapes; matching shapes to real objects; recognising shape patterns; counting shapes in puzzles; drawing mirror images [9].

Additional NY State topics not emphasised by K5

The NY kindergarten standards include the following topics that K5 does not explicitly cover or emphasise:

Additional NY topic	Evidence	Brief description / rationale
Count to 100 by ones and tens; count forward from any number	The NY standard requires counting to 100 by ones and tens and starting from any number [10].	K5's counting focuses on numbers up to 20; the app should incorporate counting sequences to 100 (e.g., interactive hundreds charts, skip-counting games).
Write numbers 0–20 and understand one-to-one correspondence and cardinality	NY requires writing numerals 0–20, connecting counting with one-to-one correspondence and understanding that the last number counted represents the total [11].	K5 addresses writing numbers 1–20 but does not explicitly emphasise cardinality or one-to-one correspondence.
Fluently add and subtract within 5; decompose and compose numbers ≤ 10; find the number that makes 10	NY standards require decomposing numbers ≤ 10 into pairs and finding the number that makes 10 when added to a given number [12].	K5 introduces addition/ subtraction to 20 but may not systematically teach number bonds and fluency within 5 or pairs summing to 10.
Compose and decompose numbers 11–19 into ten ones and some further ones (foundation for place value)	NY standard K.NBT.1 emphasises understanding that numbers 11–19 are composed of ten ones and additional ones [13].	K5 introduces tens and ones in grade 1; this concept is absent in K5's kindergarten list.
Duplicate, extend and create simple patterns	NY standard K.OA.6 calls for duplicating and creating patterns [14].	K5 focuses on recognising and continuing patterns but not on children creating their own patterns.
Classify and count objects into categories	NY standard K.MD.3 involves classifying objects and counting the number in each category [15].	K5 emphasises graphing but does not explicitly mention categorical classification and sorting without graphs.
Use precise vocabulary for measurable attributes (e.g., big/small, heavy/ light) and compare two objects directly	NY standards stress describing measurable attributes and directly comparing two objects [16].	K5 covers measurement but does not emphasise vocabulary like "heavier vs. lighter" or "longer vs. shorter" as a learning target.

Additional NY topic	Evidence	Brief description / rationale
Explore coins and identify pennies and dimes	NY kindergarten includes exploring coins and identifying pennies and dimes [17] .	K5 covers coins in a general sense, but an explicit introduction to coins in kindergarten (beyond grade 1) should be added.
Describe positions using positional words (above, below, beside, in front of, behind, next to)	NY standard K.G.1 emphasises positional vocabulary [18] .	K5's shape lessons do not highlight positional language.
Model shapes by building and drawing; compose larger shapes from simpler shapes	NY standards include modeling objects with shapes and composing simple shapes to form larger shapes [19] .	K5 asks children to trace and identify shapes but does not teach composition of shapes or building shapes with components.

Consolidated Kindergarten topic list

Combining K5 topics with NY additions yields the following comprehensive kindergarten syllabus:

- **Counting and numerals:** count objects and numbers to 100; write numerals 0–20; understand cardinality and one-to-one correspondence; compare numbers; identify odd/even; recognize ordinal positions (1st–10th).
- **Number relationships:** decompose and compose numbers ≤ 10; fluently add/subtract within 5; find pairs that sum to 10; compose/decompose 11–19 into ten ones and extra ones.
- **Patterns:** recognize, duplicate, extend and create simple patterns.
- **Operations:** represent addition/subtraction with objects, drawings or sounds; solve addition/subtraction problems within 10 using strategies; add/subtract within 20 (per K5).
- **Measurement:** describe and compare measurable attributes (length, weight, capacity); use precise vocabulary (big/small, heavy/light); measure lengths with non-standard units; order objects by size; explore coins (pennies, nickels, dimes, quarters) and identify pennies and dimes.
- **Classification and data:** classify objects into categories and count; create and read simple bar charts (per K5 graphing).
- **Money:** recognize coins and values (K5) – integrated with exploration of coins.
- **Geometry:** name 2-D shapes (squares, circles, triangles, rectangles, hexagons) and 3-D shapes (cubes, cones, cylinders, spheres); distinguish between 2-D and 3-D; describe positions (above, below, beside, in front of, behind, next to); analyze and compare shapes using informal language (sides, vertices); model shapes by building or drawing; compose larger shapes from smaller ones; match shapes to real objects; draw mirror images and tangrams.

Grade 1 comparison

Topics covered by K5

K5's grade 1 math program includes these areas:

- **Number charts & counting** – counting sequences and number charts (often up to 100) with skip-counting patterns [20].
- **Number patterns** – identifying and extending patterns based on simple addition or subtraction [21].
- **Comparing numbers** – ordering numbers and using greater-than/less-than symbols [22].
- **Base 10 blocks & ten frames** – composing and decomposing numbers into tens and ones; using ten frames and base-10 blocks [23].
- **Place value** – identifying tens and ones; building numbers from tens and ones; rounding to the nearest 10; expanded and standard form [24].
- **Fractions** – introduction to halves and quarters using shapes and sets [25].
- **Measurement** – comparing and measuring lengths; ordering objects by length; understanding weight and capacity [26].
- **Counting money** – identifying and counting coins; counting combinations of pennies, nickels, dimes and quarters [27].
- **Telling time** – reading analog clocks (whole, half and quarter hours), drawing clock hands and understanding elapsed time [28].
- **Geometry** – identifying and drawing 2-D shapes; rotating, scaling and mirror-imaging shapes; introducing 3-D shapes [29].
- **Addition** – adding with pictures and number lines; mental addition to 20; number bonds; doubles/near doubles; adding whole tens and simple two-digit sums; addition word problems [30].
- **Subtraction** – subtracting using pictures, number lines, mental subtraction within 20, column subtraction without borrowing and mixed add/subtract word problems [31].
- **Data & graphing** – sorting and counting items, creating and interpreting pictographs and bar graphs [32].
- **Word problems** – one-step problems combining addition, subtraction, time, money and measurement [33].

Additional NY State topics not emphasised by K5

The grade 1 NY standards include several concepts beyond the K5 curriculum:

Additional NY topic	Evidence	Brief description / rationale
Unknown-addend problems & equal sign understanding	NY-1.OA.4 treats subtraction as finding an unknown addend; NY-1.OA.7 emphasises understanding the equal sign and determining whether equations are true/false [34].	K5 teaches subtraction and addition but does not explicitly address unknown-addend reasoning or equal sign meanings.

Additional NY topic	Evidence	Brief description / rationale
Properties of operations (commutative and associative)	NY-1.OA.3 asks students to apply properties of operations as strategies [35].	K5's addition lessons do not mention commutative or associative properties explicitly.
Relate counting to addition and subtraction; strategies within 20	NY-1.OA.5–6 require counting on, making ten, decomposing numbers, using relationships and creating equivalent but easier sums [36].	K5 includes some mental addition strategies, but additional emphasis on these varied strategies may be required.
Determine unknown number in an equation	NY-1.OA.8 expects students to find an unknown in any position of an equation [37].	This is not explicitly taught in K5's grade 1 curriculum.
Count to 120 from any starting point; read and write numbers to 120	NY-1.NBT.1 extends counting and numeration beyond 100 [38].	K5's number charts often stop at 100; the app should support counting and writing numbers up to 120.
Compare two-digit numbers using place value (tens and ones) and the symbols >, =, <	NY-1.NBT.3 emphasises comparing numbers based on tens and ones [39].	K5 compares numbers but may not emphasise place-value reasoning with symbols.
Add within 100 (two-digit + one-digit or two-digit + multiple of 10) using place-value strategies	NY-1.NBT.4 calls for adding two-digit numbers with understanding of tens and ones and sometimes composing a ten [40].	K5 adds within 50 and avoids regrouping; the app should progress to two-digit sums with place-value strategies.
Mentally find 10 more or 10 less than a given number	NY-1.NBT.5 emphasises mental 10-more/10-less calculations [41].	K5 does not highlight this mental operation explicitly.
Subtract multiples of 10 within 10–90	NY-1.NBT.6 requires subtracting multiples of 10 using place-value strategies [42].	K5 focuses on subtracting smaller numbers and may not address multiple-of-ten subtraction.
Order three objects by length and compare lengths indirectly using a third object	NY-1.MD.1 details ordering objects by length and indirect comparison [43].	K5 measurement involves direct comparison; the concept of indirect comparison should be added.

Additional NY topic	Evidence	Brief description / rationale
Measure lengths using iterated length units and express the measurement as a whole number of units	NY-1.MD.2 calls for measuring an object by laying units end to end [44].	K5 measurement uses non-standard units and simple rulers but may not emphasise iterating units and recording the number of units used.
Tell and write time in hours and half-hours; understand "o'clock" and "half past"; count coins including dimes and pennies up to 100 cents	NY-1.MD.3 requires telling time to the half hour on analog/digital clocks; recognising coins and counting dimes and pennies [45].	K5 covers time and money, but additional exercises (half-hours, "half past," counting mixed coins with cent notation) may be needed.
Represent and interpret data with up to three categories and compare category counts	NY-1.MD.4 emphasises organising data into categories and comparing counts [46].	K5's graphing introduces bar graphs; the app should include questions about category totals and differences.
Distinguish defining vs. non-defining attributes of shapes	NY-1.G.1 asks students to recognise defining attributes (e.g., triangles are closed and three-sided) versus non-defining attributes (colour, orientation) [47].	K5 geometry focuses on naming and drawing shapes but does not emphasise defining attributes.
Compose two- and three-dimensional shapes into composite shapes	NY-1.G.2 encourages composing shapes to create new shapes [48].	K5 introduces rotation and scaling but not composition of shapes.
Partition circles and rectangles into halves and quarters; describe shares using fraction language	NY-1.G.3 emphasises partitioning shapes into equal shares and using terms like halves and quarters [49].	K5 introduces simple fractions but may not connect fraction vocabulary to partitioning.

Consolidated Grade 1 topic list

Combining K5 topics with NY additions gives a comprehensive grade 1 syllabus:

- **Counting and numeration:** count, read and write numbers up to 120; skip-count by 2s, 5s and 10s; compare numbers using >, < and =; generate and extend number patterns; relate counting to addition and subtraction.
- **Addition & subtraction:** solve one-step addition/subtraction problems with unknowns in any position; add three numbers ≤ 20; use properties of operations (commutative and associative); understand subtraction as an unknown-addend problem; employ strategies (counting on, making ten, decomposing numbers, creating equivalent sums); fluently add/subtract within 10 and work within 20; determine unknown numbers in equations; understand the equal sign as "balanced."

- **Place value:** understand tens and ones; compose and decompose numbers into tens and ones; compare two-digit numbers; add within 100 (two-digit + one-digit, two-digit + multiple of 10) using place-value strategies; mentally find 10 more or 10 less; subtract multiples of 10 within 10–90.
- **Base-10 blocks & ten frames:** use manipulatives to represent tens and ones; regroup ones into tens; add and subtract using base-10 blocks and ten frames.
- **Fractions:** partition circles and rectangles into halves and quarters; describe each share as a half or a quarter; recognise that decomposing into more shares creates smaller pieces.
- **Measurement:** order and compare lengths (directly and indirectly); measure lengths using iterated units; understand and compare weight and capacity; tell and write time to the hour and half-hour using analog and digital clocks; use “o’clock” and “half past”; recognise coins (penny, nickel, dime, quarter) and their values; count mixed collections of coins up to 100 cents; understand and use the cent symbol.
- **Data & graphing:** collect and organise data into up to three categories; create pictographs and bar charts; ask and answer questions about category totals and compare differences.
- **Geometry:** identify and draw 2-D shapes (rectangles, squares, triangles, circles, ovals, rhombuses, trapezoids, half-circles, quarter-circles) and 3-D shapes (cubes, rectangular prisms, cones, cylinders); distinguish defining vs non-defining attributes; build and draw shapes to possess defining attributes; compose shapes to make composite shapes; rotate and scale shapes; draw mirror images; partition shapes into halves and quarters; recognise and describe real-world objects matching shapes.
- **Word problems and mixed applications:** solve word problems involving addition, subtraction, time, money, measurement and data using drawings, number sentences and manipulatives; check solutions using the equal sign and unknown-addend reasoning.

Summary

K5 Learning provides a solid foundation for kindergarten and grade 1 math through interactive worksheets focusing on counting, basic operations, measurement, money, graphing and geometry. However, the New York State Next Generation Mathematics Standards include additional competencies—such as counting to 100/120, fluency within smaller ranges, place-value decomposition of teen numbers, properties of operations, unknown-addend reasoning, advanced measurement techniques, data interpretation, and shape composition—that are not fully covered by K5. Incorporating these topics into the curriculum will ensure full alignment with NY state expectations and offer learners a more comprehensive and standards-compliant experience.

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1 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 New York State Next Generation Mathematics Learning Standards Grade 1 Crosswalk
https://www.nysed.gov/sites/default/files/programs/curriculum-instruction/nys-math-standards-grade-1-crosswalk.pdf

2 Free Preschool & Kindergarten Numbers & Counting Worksheets-Printable | K5 Learning
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10 11 12 13 14 15 16 17 18 19 New York State Next Generation Mathematics Learning Standards Kindergarten Crosswalk
https://www.nysed.gov/sites/default/files/programs/curriculum-instruction/nys-math-standards-kindergarten-crosswalk.pdf

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