

**Kindergarten (5-yr. olds) Mathematics Standards
Fayette County Public Schools**

<u>Number Sense Standards:</u> *N/K.1 Demonstrate number sense to 20 using 1 to 1 correspondence	<u>Whole Number Operations & Computation:</u>	<u>Fractions & Decimals:</u>
<p align="center"><u>Skills, Concepts, & Relationships</u></p> <ul style="list-style-type: none"> *Demonstrate 1 to 1 correspondence *Count objects to 20 *Match sets, recognize & write numbers to 20 *Recognize position (above, below, etc.) *Determine more, fewer, same as, & one more than *Rote count to 50 -Introduce ordinal numbers -Introduce place value (ones & tens) -Introduce estimates with numbers 	<p align="center"><u>Skills, Concepts, & Relationships</u></p> <ul style="list-style-type: none"> -Introduce/Model addition & subtraction concepts with concrete materials/manipulatives -Introduce recognizing the calculator as a math tool 	<p align="center"><u>Skills, Concepts, & Relationships</u></p> <ul style="list-style-type: none"> -Introduce whole, halves, & equal parts -Introduce using manipulatives to identify wholes, halves, and equal parts

<u>Geometry Standards:</u> *G/K.1 Demonstrate the spatial relationship of 2 objects (inside/outside between, etc.) *G/K.2 Sort and identify basic shapes (rectangle, circle, oval, square, triangle, rhombus)	<u>Measurement:</u>
<p align="center"><u>Skills, Concepts, & Relationships</u></p> <ul style="list-style-type: none"> *Demonstrate spatial relationships: <ul style="list-style-type: none"> inside/outside over/under in front of/behind top/middle/bottom left/right beside above/below *Recognize & name shapes: rectangle, circle, oval, square, triangle, rhombus 	<p align="center"><u>Skills, Concepts, & Relationships</u></p> <ul style="list-style-type: none"> -Introduce using concrete objects to compare length, size, & weight (order by size) -Introduce estimating with non-standard units of measure (length, weight) -Introduce measuring length & weight with non-standard & standard units -Introduce exploring a variety of measurement tools -Introduce calendars -Introduce time to hour and ½ hour -Introduce coins (recognizing & value)

**1st Grade / P1 (6-yr. olds) Mathematics Standards
Fayette County Public Schools**

<u>Number Sense Standards:</u> *N/P1.1 Demonstrate number sense to 100 using place value	<u>Whole Number Operations & Computation Standards:</u> *C/P1.1 Demonstrate basic math facts using multiple strategies (addition and subtraction facts to 10)	<u>Fractions & Decimals:</u>
<p align="center"><u>Skills, Concepts, & Relationships</u></p> <p>*Recognize, identify, count on, count forward & write numerals to 100 *Understand number positions (after, before, between) *Understand place value (1s, 10s) -Introduce counting backwards from 100 -Introduce order relations to compare whole numbers (<, >, =) -Introduce skip counting to 100 (by 2s, 5s, & 10s) -Introduce odd & even numbers -Introduce applying number sense in real-life situations -Develop estimates with numbers</p>	<p align="center"><u>Skills, Concepts, & Relationships</u></p> <p>*Manipulate objects to solve one-step problems (addition & subtraction) *Know addition and subtraction facts to 10 *Find sums and differences *Understand basic concept of the commutative property (6+4=4+6) *Understand basic concept of properties of 0 for addition (5+0=5) and subtraction (5-0=5) -Introduce addition and subtraction facts to 18 -Introduce adding and subtracting 2-digit numbers with no regrouping -Introduce adding with 3 addends (associative property) -Introduce missing addends -Introduce performing repeated addition and subtraction -Introduce one-step story problems with real-life situations -Introduce exploring calculators -Introduce giving reasonable answers -Introduce inverse operations of addition and subtraction (4+2=6, 6-4=2) fact families -Introduce using a variety of mathematics vocabulary (plus, add, find the sum, etc.)</p>	<p align="center"><u>Skills, Concepts, & Relationships</u></p> <p>*Recognize and write 1/2, 1/3, 1/4 *Recognize equal parts of a whole</p>

<u>Geometry Standards:</u> *G/P1.1 Compare & contrast properties of basic shapes	<u>Measurement:</u>
<p align="center"><u>Skills, Concepts, & Relationships</u></p> <p>*Compare & contrast properties of shapes: circle/oval triangle/rhombus rectangle/square **Review demonstrating spatial relationships: inside/outside over/under in front of/behind top/middle/bottom left/right -Introduce simple Venn diagrams -Introduce exploring properties of 3-D figures (sphere, cube, cylinder, rectangular solid, pyramid, cone)</p>	<p align="center"><u>Skills, Concepts, & Relationships</u></p> <p>*Understand calendar concepts (days of week & months) *Tell time to hour & ½ hour *Make change to \$.10 (10 cents) -Introduce comparing & ordering by size, length, or mass -Develop estimating length & weight with non-standard & standard units and comparing with known measures (measure to the nearest inch or centimeter) -Develop measuring length with non-standard & standard units -Introduce time to 5 minute intervals -Introduce estimating time -Develop identifying and comparing values of coins -Introduce exploring capacity with non-standard units -Introduce am & pm</p>

2nd Grade / P2 (7-yr. olds) Mathematics Standards Fayette County Public Schools

<u>Number Sense Standards:</u> *N/P2.1 Demonstrate number sense to 1000 through modeling, applying and communicating multiple representations (drawings, concrete materials, & symbols) and using order relations	<u>Whole Number Operations & Computation Standards:</u> *C/P2.1 Demonstrate basic math facts using multiple strategies (addition and subtraction facts to 18) *C/P2.2 Determine appropriate operation (addition or subtraction) in real-life applications	<u>Fractions & Decimals:</u>
<u>Skills, Concepts, & Relationships</u> *Recognize, identify, count, & write numbers (& number words) to 1000 *Count backwards from 100 *Compare & order whole numbers (<, >, =) to 1000 *Understand place value (to 1000s) *Skip count to 100 (by 2s, 5s, & 10s) *Recognize odd & even numbers *Recognize ordinal numbers -Develop applying number sense in real-life situations -Develop giving reasonable estimates	<u>Skills, Concepts, & Relationships</u> *Generate fact families using inverse operations ($4+2=6$, $6-4=2$) *Know addition and subtraction facts to 18 *Add and subtract 2-digit & 3-digit numbers without regrouping -Develop doing column addition -Develop finding missing addends -Introduce adding and subtracting money -Introduce multiplication with use of manipulatives and arrays (facts to 5s) -Introduce use of number sentences to solve one & two step story problems -Introduce solving problems with extra unneeded information -Introduce using a calculator to explore number patterns, and to add & subtract -Introduce estimating sums and differences -Introduce using a variety of mathematics vocabulary (plus, add, find the sum, minus, subtract, find the difference, etc.)	<u>Skills, Concepts, & Relationships</u> *Recognize and write $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{6}$ -Introduce decimals to represent money

<u>Geometry Standards:</u> *G/P2.1 Identify and classify similar plane and solid figures in various orientations *G/P2.2 Create and extend geometric patterns using concrete/pictorial models and recognize their use in the real world	<u>Measurement Standards:</u> *M/P2.1 Use a variety of units, tools, and methods to measure (including estimation) *M/P2.2 Compare & order weight/mass and length
<u>Skills, Concepts, & Relationships</u> *Sort & identify 3-D figures by attributes (faces, edges, bases) & in different orientations (sphere, cube, cylinder, rect. solid, pyramid, cone) -Introduce exploring plane figures and closed curves -Introduce perimeter -Introduce area (surface & surface units) -Introduce exploring congruence -Develop using Venn diagrams -Introduce constructing & comparing 3-D and/or 2-D shapes -Introduce exploring symmetry	<u>Skills, Concepts, & Relationships</u> *Compare & order objects by size, length (measure to the nearest inch or centimeter), & mass *Identify, recognize, & compare the value of coins *Count money *Tell time to 5-minute intervals **Review calendar concepts -Develop estimating length, weight/mass & temperature in standard units -Develop using metric/customary measures (length, weight/mass, temperature) -Introduce use of metric/customary measures of capacity (cup, pint, quart, gallon) -Introduce choosing the appropriate measurement tools -Develop estimating time -Introduce making change to \$1.00 -Introduce estimating amounts of money -Introduce time to 1-minute intervals -Introduce elapsed time to (to hour) -Develop distinguishing between am & pm

3rd Grade / P3 (8-yr. olds) Mathematics Standards
Fayette County Public Schools

<u>Number Sense Standards:</u> *N/P3.1 Demonstrate number sense to 10,000 through modeling, applying and communicating multiple representations (drawings, concrete materials, & symbols) and using order relations	<u>Whole Number Operations & Computation Standards:</u> *C/P3.1 Demonstrate basic math facts using multiple strategies (addition and subtraction of 2-digit & 3-digit numbers with regrouping; & multiplication to 9) *C/P3.2 Determine appropriate operation (addition, subtraction, or multiplication) in real-life applications	<u>Fractions & Decimals Standards:</u> *FD/P3.1 Demonstrate knowledge of simple fractions
<u>Skills, Concepts, & Relationships</u> *Recognize, identify, count, & write numbers (& number words) to 10,000 *Compare & order whole numbers (<, >, =) to 10,000 *Understand place value (to 10,000s) -Introduce multiples -Introduce factors -Introduce primes & composites -Introduce rounding of whole numbers -Develop applying number sense in real-life situations and interpreting multiple uses of numbers in real world -Introduce Roman numerals -Introduce square numbers with arrays -Develop giving reasonable estimates	<u>Skills, Concepts, & Relationships</u> *Add and subtract 2-digit & 3-digit numbers with regrouping *Do column addition *Find missing addends *Know multiplication facts to 9 *Understand basic concept of properties of 0 ($5 \times 0 = 0$) and 1 ($5 \times 1 = 5$) for multiplication -Develop adding and subtracting money -Introduce multiplying by 1-digit & 2-digit factors -Introduce missing factors -Introduce division facts with concrete material (arrays) relate to fact families in multiplication ($4 \times 2 = 8$ so $8 \div 2 = 4$) -Introduce simple division with and without remainders -Develop use of number sentences to solve 1 and 2 step story problems -Develop calculator skills: Know 4 basic functions of calculator (+, -, x, \div) Check answers with a calculator Use a calculator in problem solving -Develop estimating sums, differences, & products of whole numbers -Develop using a variety of mathematics vocabulary (plus, add, find the sum, minus, subtract, find the difference, times, multiply, find the product, etc.) -Develop translating concrete and pictorial problem situations into mathematical language and symbols and vice versa (1 and 2 step)	<u>Skills, Concepts, & Relationships</u> *Recognize, read, write, & use simple fractions ($1/2$, $1/3$, $1/4$, $1/6$, $1/8$, $1/10$) -Introduce comparing & ordering fractions using concrete materials -Introduce equivalent fractions -Introduce identifying the numerator & the denominator -Introduce using concrete and pictorial models to explore decimal concepts (10ths, 100 th s) -Introduce comparing & ordering decimals (10ths, 100ths) -Develop using decimals to represent money -Introduce adding & subtracting decimals (money) -Introduce exploring decimal place value with a calculator -Introduce relating fractions and decimals -Introduce negative numbers in real world situations (temperature) -Introduce parts of a set versus parts of a whole

<u>Geometry Standards:</u> *G/P3.1 Demonstrate basic knowledge of symmetry & congruence	<u>Measurement Standards:</u> *M/P3.1 Use standard units (metric & customary) of measurement (include estimation) *M/P3.2 Demonstrate knowledge of time *M/P3.3 Demonstrate knowledge of money
<u>Skills, Concepts, & Relationships</u> *Recognize and draw a line of symmetry *Recognize and match congruent figures *Demonstrate the results of combining, subdividing, and changing shapes -Introduce pentagon, hexagon, & octagon -Introduce angles (acute, right, obtuse, straight) -Introduce lines (parallel, perpendicular) -Introduce line segments, rays, points -Develop exploring perimeter -Develop exploring area -Introduce volume of 3-D objects with physical models and materials -Develop using Venn diagrams -Develop constructing 3-D objects from 2-D pictures -Introduce exploring flips, slide, turns with physical models -Introduce describing & modeling 2-D views of 3-D figures (faces, edges, vertices, bases)	<u>Skills, Concepts, & Relationships</u> *Use metric/customary measures to find length (measure to the nearest $1/2$ inch or centimeter), weight/mass, & temperature *Tell time to 1-minute intervals (before & after hour) *Demonstrate knowledge of elapsed time to hour & $1/2$ hour *Distinguish between am & pm *Make change to \$1.00 **Review counting money -Develop comparing & ordering by size, length, mass, & area -Develop estimating length, weight/mass, temperature, & capacity in standard units -Develop understanding of basic length relationships within same measurement system (in./ft./yd) -Develop using metric/customary measures of capacity (cup, pint, quart, gallon) -Introduce basic concepts of area, perimeter, volume, & circumference with manipulatives -Introduce rounding measurements -Develop choosing the appropriate measurement tools -Develop estimating time -Develop estimating amounts of money -Introduce adding & subtracting money -Introduce scale drawings

**4th Grade Mathematics Standards
Fayette County Public Schools**

Number/Computation

INTERMEDIATE MATHEMATICS EXIT PERFORMANCE STANDARD 1: Student will apply number sense, place value, and order relations to compare whole numbers up to 100 million, fractions to the 1/16th, and decimals to the 1,000ths in problem solving situations to perform basic calculations involving addition, subtraction, multiplication and division of whole numbers and money with and without calculators, and will communicate the reasoning used in solving these problems.

Based on Kentucky's Core Content for Mathematics Assessment, the Kentucky Program of Studies, and Academic Expectations: 1.5-1.9 Mathematical Communication & Reasoning, 1.16 Technology, 2.7 Number, 2.8 Procedures, 2.11 Change, 2.12 Structure; Goal 5 Think & Solve Problems; & Goal 6 Connect & Integrate Knowledge

<p align="center"><u>4th Grade Number Sense Standards :</u></p> <p>*N/4.1 Demonstrate number sense to 1 million (1,000,000) through modeling, applying and communicating multiple representations (drawings, concrete materials, & symbols) and using order relations</p>	<p align="center"><u>4th Grade Whole Number Operations & Computation Standards:</u></p> <p>*C/4.1 Select and apply the appropriate computational operations (+,-,x, ÷ by 1-digit with remainders) to solve multi-step problems in real-life situations</p>	<p align="center"><u>4th Grade Fractions & Decimals Standards:</u></p> <p>*FD/4.1 Demonstrate knowledge and use of decimals to the 100ths. *FD/4.2 Model, apply and communicate multiple representations of fractions to the 1/16ths.</p>
<p><u>Skills, Concepts, & Relationships</u></p> <ul style="list-style-type: none"> *Use number words, numerals, diagrams, concrete materials, & expanded form to represent numbers to 1 million (1,000,000) *Compare & order (<,>=, number line) whole numbers to 1 million *Understand place value to 1 million *Identify square numbers with arrays *Identify primes & composites -Develop identifying multiples & factors -Introduce LCM (Least Common Multiple) -Introduce GCF (Greatest Common Factor) -Develop rounding whole numbers -Develop recognizing when an estimate is appropriate -Introduce using estimation strategies: compatible numbers, front end, rounding , range, over estimate & under estimate, clustering 	<p><u>Skills, Concepts, & Relationships</u></p> <ul style="list-style-type: none"> *Add and subtract 3-digit & 4-digit numbers with regrouping (column addition) *Add, subtract, & multiply money *Multiply by 1-digit & 2-digit factors *Use multiples of 10, 100, 1000 *Find missing factors *Find factor pairs *Recognize fact families for multiplication and division (inverse operations) *Divide by 1-digit *Divide by multiples of 10 **Review multiplication facts to 9 -Introduce division by 2-digit -Introduce using zeros in quotient -Introduce order of operations -Develop choosing the correct operation in multi-step story problems -Develop choosing appropriate problem solving strategies -Develop calculator skills: <ul style="list-style-type: none"> Know 4 basic functions of calculator (+, -, x, ÷) Check answers with a calculator Use a calculator in problem solving -Develop estimating sums, differences, & products of whole numbers -Develop using a variety of mathematics vocabulary and symbols (sum, difference, product, quotient, 1/2, x, ÷, etc.) 	<p><u>Skills, Concepts, & Relationships</u></p> <ul style="list-style-type: none"> *Demonstrate knowledge of equivalent fractions (including use of factors & multiples) *Add and subtract decimals to the 100ths (money) *Read, write, and identify decimals (to 100ths) *Model, apply and communicate multiple representations of fractions -Develop identifying the numerator & the denominator -Develop comparing & ordering fractions to the 1/16ths -Introduce adding & subtracting like fractions to the 1/16ths using concrete materials -Introduce rewriting fractions in lowest terms -Intro improper fractions and mixed numbers -Develop using models to solve real world problems with fractions and decimals -Develop comparing & ordering decimals (10ths, 100ths, 1000ths) -Develop rounding decimals (10ths, 100ths, 1000ths) -Introduce using zeros as a place holder -Develop relating fractions, decimals and whole numbers -Develop understanding use of negative numbers in real world -Introduce estimating sums, differences, & products of fractions & decimals -Develop exploring parts of a set versus parts of a whole

**4th Grade Mathematics Standards
Fayette County Public Schools**

Geometry/Measurement

INTERMEDIATE MATHEMATICS EXIT PERFORMANCE STANDARD 2: Student will apply properties of measurement (length to 1/16" or mm, weight/mass, temperature, time, money, capacity, perimeter and area of squares, rectangles, triangles) and will use geometric concepts (plane 2D shapes, solid 3D shapes, lines, angles, basic geometric terms) and relationships in problem solving situations and communicate the reasoning used in solving these problems.

Based on Kentucky's Core Content for Mathematics Assessment, the Kentucky Program of Studies, and Academic Expectations: 1.5-1.9 Mathematical Communication & Reasoning, 1.16 Technology, 2.8 Procedures, 2.9 Space and Dimensionality, 2.10 Measurement, 2.11 Change, 2.12 Structure; Goal 5 Think & Solve Problems; & Goal 6 Connect & Integrate Knowledge

<p align="center">4th Grade Geometry Standards:</p> <p>*G/4.1 Demonstrate knowledge of basic geometric terms and shapes (e.g.-lines, rays, segments, point, angles)</p>	<p align="center">4th Grade Measurement Standards:</p> <p>*M/4.1 Measure a wide variety of attributes of a given object using estimation and metric & customary measures.</p>
<p align="center"><u>Skills, Concepts, & Relationships</u></p> <ul style="list-style-type: none"> *Recognize, describe, model, draw, & compare: faces; vertices of solids; edges *Recognize, describe, model, draw, & compare: vertices of angles; rays; line segments; points; parallel, intersecting, & perpendicular lines *Recognize, describe, model, draw, & compare: quadrilaterals, pentagons, hexagons, & octagons *Predict and verify the results of combining, subdividing and changing shapes **Review recognizing & drawing a line of symmetry **Review recognizing & matching congruent figures -Introduce drawing and measuring angles(vertex, side, degree) -Introduce formulas (perimeter, area) -Develop finding volume of 3-D objects with physical models and materials -Develop transformations (flips, slides, turns) with physical models -Introduce similar figures -Introduce circles (center, diameter, circumference, radius) -Develop drawing 2-D views of 3-D figures -Develop constructing 3-D objects from 2-D pictures 	<p align="center"><u>Skills, Concepts, & Relationships</u></p> <ul style="list-style-type: none"> *Use metric & customary measures to determine length (measure to the nearest 1/4th & 1/8th inch or centimeter) weight/mass, temperature, capacity *Measure area of: squares and rectangles *Measure perimeter of: squares, rectangles, triangles, and polygons *Add, subtract, & multiply money amounts -Develop comparing & ordering by size, length, mass, area, & volume -Develop estimating length, weight/mass, capacity, volume, perimeter, & area in standard units -Introduce round measurements -Introduce finding the area of a triangle -Develop choosing appropriate measurement tools -Introduce measuring circumference with string -Develop exploring scale drawings -Develop elapsed time -Develop estimating time -Introduce adding & subtracting time -Introduce time zones -Develop understanding relationships within the same measurement system (customary, metric)

**5th Grade Mathematics Standards
Fayette County Public Schools**

Number/Computation

INTERMEDIATE MATHEMATICS EXIT PERFORMANCE STANDARD 1: Student will apply number sense, place value, and order relations to compare whole numbers up to 100 million, fractions to the 1/16th, and decimals to the 1,000ths in problem solving situations to perform basic calculations involving addition, subtraction, multiplication and division of whole numbers and money with and without calculators, and will communicate the reasoning used in solving these problems.

Based on Kentucky's Core Content for Mathematics Assessment, the Kentucky Program of Studies, and Academic Expectations: 1.5-1.9 Mathematical Communication & Reasoning, 1.16 Technology, 2.7 Number, 2.8 Procedures, 2.11 Change, 2.12 Structure; Goal 5 Think & Solve Problems; & Goal 6 Connect & Integrate Knowledge

<p align="center"><u>5th Grade Number Sense Standards:</u></p> <p>*N/5.1 Demonstrate number sense to 100 million (100,000,000) through modeling, applying and communicating multiple representations (drawings, concrete materials, & symbols) and using order relations</p>	<p align="center"><u>5th Grade Whole Number Operations & Computation Standards:</u></p> <p>*C/5.1 Select and apply the appropriate computational operations (+, -, x, ÷ by 2-digit with remainders) to solve multi-step problems in real-life situations *C/5.2 Apply appropriate computational method/tool (estimation, mental arithmetic, paper & pencil, calculator, computer) to solve real-life problems</p>	<p align="center"><u>5th Grade Fractions & Decimals Standards:</u></p> <p>*FD/5.1 Use order relations (<, >, =, number line) to compare fractions and decimals. *FD/5.2 Apply computational operation(s) to solve problems in real-life situations using fractions to the 1/16ths and decimals (add and subtract to the 1000ths & multiply and divide to the 100ths). *FD/5.3 Model, apply and communicate multiple representations of decimals to the 1000ths.</p>
<p align="center"><u>Skills, Concepts, & Relationships</u></p> <ul style="list-style-type: none"> *Use number words, numerals, diagrams, concrete materials, & expanded form to represent numbers to 100 million (100,000,000) *compare & order (<, >, =, number line) whole numbers to 100 million *Understand place value to 100 million *Identify multiples & factors *Round whole numbers *Use estimation strategies: compatible numbers, front end, rounding, range, over estimate & under estimate, clustering *Identify & use square numbers (arrays) *Identify LCM (Least Common Multiple) *Identify GCF (Greatest Common Factor) **Review identifying primes & composites -Introduce using prime factorization -Introduce exponents -Introduce integers using a number line -Develop recognizing when an estimate is appropriate 	<p align="center"><u>Skills, Concepts, & Relationships</u></p> <ul style="list-style-type: none"> *Add, subtract, multiply, divide money *Multiply 2-digit & 3-digit numbers by 2-digit numbers *Divide by 2-digit divisor *Choose correct operation (+, -, x, ÷) **Review adding & subtracting of 3-digit & 4 digit numbers with regrouping (column addition) **Review fact families for multiplication and division (inverse operations) -Introduce interpreting remainders (represents part of whole) -Develop order of operations -Develop recognizing & using associative (grouping) and commutative (order) properties -Develop doing multi-step story problems using all operations -Develop choosing appropriate problem solving strategies -Develop calculator skills: <ul style="list-style-type: none"> Know 4 basic functions of calculator (+, -, x, ÷) Check answers with a calculator Use a calculator in problem solving Use a calculator with large cumbersome numbers -Develop estimating sums, differences, products, & quotients of whole numbers -Develop using a variety of mathematics vocabulary and symbols (sum, difference, product, quotient, 1/2, x, ÷, etc.) 	<p align="center"><u>Skills, Concepts, & Relationships</u></p> <ul style="list-style-type: none"> *Compare & order fractions to the 1/16th (<, >, =, number line) *Add & subtract like fractions to the 1/16th *Rewrite fractions in lowest terms *Simplify improper fractions and understand mixed numbers *Compare & order decimals to the 1,000ths (<, >, =, number line) *Add & subtract decimals to the 1,000ths *Multiply & divide decimals to the 100ths (money) *Read, write, identify and round decimals through the 1,000ths *Recognize simple percents (100%, 75%, 50%, 25%) **Review using equivalent fractions -Introduce adding & subtracting simple unlike fractions (1/2 + 3/4) -Develop using models to solve real world problems using fractions, decimals, & percents -Develop using zeros as place holders -Introduce relating fractions, decimals and percents (1/2 = .5 = 50%) -Develop comparing and ordering decimals to the 10,000ths -Introduce definition of ratio with multiple representations -Introduce equal ratios -Develop estimating sums, differences, products, & quotients of fractions & decimals -Introduce estimating percents

**5th Grade Mathematics Standards
Fayette County Public Schools**

Geometry/Measurement

INTERMEDIATE MATHEMATICS EXIT PERFORMANCE STANDARD 2: Student will apply properties of measurement (length to 1/16" or mm, weight/mass, temperature, time, money, capacity, perimeter and area of squares, rectangles, triangles) and will use geometric concepts (plane 2D shapes, solid 3D shapes, lines, angles, basic geometric terms) and relationships in problem solving situations and communicate the reasoning used in solving these problems.

Based on Kentucky's Core Content for Mathematics Assessment, the Kentucky Program of Studies, and Academic Expectations: 1.5-1.9 Mathematical Communication & Reasoning, 1.16 Technology, 2.8 Procedures, 2.9 Space and Dimensionality, 2.10 Measurement, 2.11 Change, 2.12 Structure; Goal 5 Think & Solve Problems; & Goal 6 Connect & Integrate Knowledge

<u>5th Grade Geometry Standards:</u>	<u>5th Grade Measurement Standards:</u>
<p>*G/5.1 Recognize, identify, draw, model, and classify various geometric terms and shapes.</p>	<p>*M/5.1 Select the appropriate measurement tools and units to make estimates and measurements in solving problems using metric & customary measures.</p>
<p align="center"><u>Skills, Concepts, & Relationships</u></p> <ul style="list-style-type: none"> *Recognize, draw and describe quadrilaterals including trapezoids & parallelograms *Recognize diagonals *Draw and measure angles (right, obtuse, acute, vertex, side, degree) *Recognize plane similar figures *Identify center, diameter, radius, circumference, chord of circles *Draw & model transformations (flips, slides, turns) of basic 2-D shapes with physical models **Review recognizing & drawing a line of symmetry **Review recognizing & matching congruent figures -Develop using formulas when presented with real-life problems (area, perimeter) -Develop drawing 2-D views of 3-D figures -Develop constructing 3-D objects from 2-D pictures -Introduce recognizing, describing, drawing & comparing triangles (equilateral, isosceles, scalene, and right) 	<p align="center"><u>Skills, Concepts, & Relationships</u></p> <ul style="list-style-type: none"> *Use metric & customary measures to determine length (measure to the nearest 1/8th & 1/16th inch or millimeter) weight/mass, temperature, capacity *Round measurements *Choose appropriate measurement tools *Demonstrate knowledge of elapsed time *Add & subtract time *Measure area of: squares, rectangles, & triangles **Review measuring perimeter of: squares, rectangles, triangles, & polygons *Add, subtract, multiply, & divide money amounts -Develop measuring circumference with string -Develop understanding relationships within the same measurement system (customary, metric) -Develop comparing & ordering by size, length, mass, area, & volume -Develop estimating length, weight/mass, capacity, volume, perimeter, area and angles in standard units -Develop creating scale drawing -Develop estimating time -Develop reading time zones -Introduce area of irregular figures with manipulatives (grid paper)

Kindergarten (5-yr. olds) Mathematics Standards
Fayette County Public Schools

Probability/Statistics:

Skills, Concepts, & Relationships

- Introduce/Model collecting, organizing, & describing data
- Introduce graphs
- Introduce number line

Algebraic Ideas Standards:

***AI/K.1 Sort objects by one attribute (color, weight, shape, length, etc.)**

Skills, Concepts, & Relationships

- Introduce identifying and describing patterns in real-life situations
- Introduce reproducing and extending a repeating pattern with manipulatives or concrete objects
- Introduce investigating relationships among real objects

Problem Solving Strategies:

- Introduce/Model appropriate problem solving strategies:
 - act out
 - use manipulatives
 - draw a picture
 - describe and discuss a problem

1st Grade / P1 (6-yr. olds) Mathematics Standards
Fayette County Public Schools

Probability/Statistics:

Skills, Concepts, & Relationships

- Introduce collecting & organizing data
- Introduce making predictions
- Introduce/Model interpreting data
- Introduce using graphs (pictographs, bar graph)
- Introduce tables & charts
- Introduce using a number line
- Introduce using tally marks
- Introduce conducting simple probability experiments
- Introduce exploring concepts of chance
- Introduce likely (near always) & unlikely (near never) outcomes
- Introduce combinations (example: If you have 3 shirts and 2 pairs of pants, how many different outfits can you make?)

Algebraic Ideas Standards:

***AI/P1.1 Sort objects by more than 1 attribute (color, weight, shape, length, etc.)**

***AI/P1.2 Describe, compare and classify objects.**

Skills, Concepts, & Relationships

- Develop identifying and describing patterns in real-life situations
- Develop reproducing and extending a repeating pattern of shapes, objects, movements, or sounds
- Introduce number patterns (skip counting to 100, odds, evens, etc.)
- Introduce input/output tables (function machines) with basic addition/subtraction facts

Problem Solving Strategies:

- Introduce/Model appropriate problem solving strategies:
 - act out
 - use manipulatives
 - draw a picture
 - describe and discuss a problem
 - look for a pattern
 - guess & check
- Introduce communicating strategies and solutions (math vocabulary and representations)

2nd Grade / P2 Mathematics Standards
Fayette County Public Schools

Probability/Statistics Standards:

***PS/P2.1 Read & interpret displays of data (bar graphs, pictographs).**

Skills, Concepts, & Relationships

- Develop collecting, organizing, & interpreting data
- Develop making predictions
- Develop/Model interpreting data
- Introduce constructing own graphs (pictograph, bar graph)
- Introduce graphing software
- Introduce/Develop using & reading line plots, charts/tables, graphs & schedules
- Develop using tally marks
- Introduce surveys
- Develop conducting simple probability experiments
- Develop exploring concepts of chance
- Develop likely (near always) & unlikely (near never) outcomes
- Develop exploring combinations (example: If you have 3 shirts and 2 pairs of pants, how many different outfits can you make?)

Algebraic Ideas Standards:

***AI/P2.1 Create, extend and communicate simple patterns.**

Skills, Concepts, & Relationships

- *Reproduce and extend a repeating pattern of numbers, shapes, etc.
- Develop using input/output tables (function machines) with basic addition/subtraction facts
- Develop investigating number patterns (skip counting to 100, odds, evens, etc.)
- Introduce identifying, describing, and analyzing patterns in real-life situations using pictures, symbols, & concrete objects (patterns in nature)
- Introduce strategies to develop logical thinking, deductive reasoning
- Introduce exploring unknowns and open sentences (simple equations) with basic addition and subtraction facts ($5 + \underline{\quad} = 7$)

Problem Solving Standards:

***PSS/P2.1 Gather & organize information to solve a problem**

- Develop/Model appropriate problem solving strategies:
 - act out
 - use manipulatives
 - draw a picture
 - describe and discuss a problem
 - look for a pattern
 - guess & check
 - make an organized list
- Develop communicating strategies and solutions (math vocabulary and representations)
- Introduce generating 1-step story problems
- Introduce determining the reasonableness of answers

3rd Grade / P3 Mathematics Standards
Fayette County Public Schools

Probability/Statistics Standards:

***PS/P3.1 Construct, read, and interpret displays of data (bar graphs, pictographs)**

***PS/P3.2 Determine likely and unlikely outcomes from probability experiments**

Skills, Concepts, & Relationships

- *Collect, organize, interpret data
- *Construct, read, interpret pictographs, bar graphs, charts, tables, & schedules
- *Perform simple surveys
- *Determine likely (near always) & unlikely (near never) outcomes
- Develop using graphing software & spreadsheets
- Introduce drawing conclusions and making inferences based on data analysis
- Introduce line & circle graphs
- Introduce line plots
- Introduce comparing graphs
- Introduce concepts of mean, median, mode, range
- Develop conducting simple probability experiments
- Develop using combinations (example: If you have 4 shirts and 3 pairs of pants, how many different outfits can you make?)
- Develop gathering & sorting information into categories using bar graphs & pictographs

Algebraic Ideas Standards:

***AI/P3.1 Create & extend patterns, and find & explain rules for number sequences.**

Skills, Concepts, & Relationships

- *Identify, describe, and analyze patterns in real-life situations using pictures, symbols, & concrete objects (patterns in nature)
- *Recognize, extend, and find rules for number patterns (skip counting to 100, odds, evens, etc.)
- *Solve for unknowns & open sentences (simple equations) with basic addition, subtraction, and multiplication facts ($5 + _ = 7$)
- *Extend patterns in number sequences
- *Use input/output tables (function machines) with basic addition, subtraction and multiplication facts
- Introduce analyzing tables, graphs, & functional relationships; and explaining how a change in one quantity result in a change in another
- Develop using strategies for logical thinking, deductive reasoning
- Develop graphing points on a number line
- Introduce reading ordered pairs of numbers and letters on a rectangular grid
- Introduce graphing coordinates on a rectangular grid (plotting points)

Problem Solving Standards:

***PSS/3.1 Use an appropriate strategy to solve a problem correctly**

***PSS/3.2 Communicate strategy and solution with mathematical vocabulary and representations**

- Develop/Model appropriate problem solving strategies:
 - act out
 - use manipulatives
 - draw a picture
 - describe and discuss a problem
 - look for a pattern
 - guess & check
 - make an organized list
 - draw a diagram
 - make and use a table
- Develop communicating strategies and solutions (including math vocabulary and representations)
- Introduce selecting most appropriate strategy
- Introduce generating 1 and 2 step story problems
- Introduce showing/explaining reasonableness of answers

**4th Grade Mathematics Standards
Fayette County Public Schools**

Probability/Statistics

INTERMEDIATE MATHEMATICS EXIT PERFORMANCE STANDARD 3:

Student will use data collection, interpretation, organization in basic graphs (bar graph, line graph, pictograph), finding statistics (mean, median, mode, range) and performing simple probability experiments (games of chance) to solve real world problems and communicate the reasoning used in solving these problems.

Based on Kentucky's Core Content for Mathematics Assessment, the Kentucky Program of Studies, and Academic Expectations: 1.5-1.9 Mathematical Communication & Reasoning, 1.16 Technology, 2.7 Number, 2.8 Procedures, 2.11 Change, 2.12 Structure, 2.13 Probability & Statistics; Goal 5 Think & Solve Problems; & Goal 6 Integrate Knowledge

4th Grade Probability/Statistics Standards:

***PS/4.1 Construct, read, and interpret displays of data (graphs, charts, tables)**

***PS/4.2 Solve problems that involve probability and statistics**

Skills, Concepts, & Relationships

- *Construct, read, & interpret line & bar graphs and charts & tables
- *Understand the relationship of fractions to probability
- *Find the average (mean) of set of numbers
- *Conduct simple probability experiments (games of chance) and make predictions
- **Review determining likely (near always/near 1) & unlikely (near never/near 0) outcomes
- **Review collecting, organizing, and interpreting data
- Develop appropriate ways to organize data
- Develop concepts of mean, median, mode, & range of data
- Introduce drawing conclusions & making inferences based on data
- Develop using graphing software & spreadsheets to create graphs
- Introduce interpreting circle graphs
- Introduce tables or tree diagrams to list all possible outcomes of an event when order matters
- Develop using frequency tables with tally marks
- Develop gathering & sorting information into categories using line & bar graphs and charts & tables

4th Grade Mathematics Standards
Fayette County Public Schools

Algebraic Ideas

INTERMEDIATE MATHEMATICS EXIT PERFORMANCE STANDARD 4: Student will apply algebraic ideas to predict, analyze, generalize and write rules for patterns involving change in numbers or shapes in problem solving situations and communicate the reasoning used in solving these problems.

Based on Kentucky's Core Content for Mathematics Assessment, the Kentucky Program of Studies, and Academic Expectations: 1.5-1.9 Mathematical Communication & Reasoning, 1.16 Technology, 2.7 Number, 2.8 Procedures, 2.9 Space and Dimensionality, 2.11 Change, 2.12 Structure; Goal 5 Think & Solve Problems; & Goal 6 Connect & Integrate Knowledge

4th Grade Algebraic Ideas Standards:

***AI/4.1 Analyze & predict using number patterns.**

***AI/4.2 Generalize patterns (square numbers, etc.) in number sequences.**

Skills, Concepts, & Relationships

*Demonstrate knowledge of functions (function machines)

*Represent and describe mathematical relationships through the use of ordered pairs, listings in a table, plotting on a graph, and looking for a pattern

*Graph points on a number line

*Graph ordered pairs in the first quadrant of the Cartesian coordinate system (plot points)

**Review identifying, describing, & creating patterns in real-life situations

**Review recognizing, extending, and finding rules for number patterns (skip counting, odds, evens, etc.)

-Develop using variables & open sentences (simple equations) to express relationships using basic addition, subtraction, multiplication, and division facts ($5 + \underline{\quad} = 7$ or $5 + n = 7$)

-Develop using strategies for logical thinking, inductive and deductive reasoning

Intermediate Problem Solving Strategies

4th Grade Problem Solving Standards:

***PSS/4.1 Use an appropriate strategy to solve a problem correctly, support the mathematical decisions made with reasoning, and show/explain reasonableness of the answer**

***PSS/4.2 Communicate strategy and solution with accurate mathematical vocabulary and representations**

-Develop/Model appropriate problem solving strategies:

act out

use manipulatives

draw a picture

describe and discuss a problem

look for a pattern

guess & check

make an organized list

draw a diagram

make and use a table

-Develop communicating strategies and solutions (including math vocabulary and representations)

-Develop selecting most appropriate strategy

-Develop generating, extending, and solving multi-step story problems

-Develop showing/explaining reasonableness of answers

5th Grade Mathematics Standards
Fayette County Public Schools

Probability/Statistics

INTERMEDIATE MATHEMATICS EXIT PERFORMANCE STANDARD 3:

Student will use data collection, interpretation, organization in basic graphs (bar graph, line graph, pictograph), finding statistics (mean, median, mode, range) and performing simple probability experiments (games of chance) to solve real world problems and communicate the reasoning used in solving these problems.

Based on Kentucky's Core Content for Mathematics Assessment, the Kentucky Program of Studies, and Academic Expectations: 1.5-1.9 Mathematical Communication & Reasoning, 1.16 Technology, 2.7 Number, 2.8 Procedures, 2.11 Change, 2.12 Structure, 2.13 Probability & Statistics; Goal 5 Think & Solve Problems; & Goal 6 Integrate Knowledge

5th Grade Probability/Statistics Standards:

***PS/5.1 Choose, construct, and interpret appropriate displays of data**

***PS/5.2 Solve problems and make predictions that involve probability and statistics**

***PS/5.3 Make inferences and convincing arguments based on data analysis**

Skills, Concepts, & Relationships

- *Draw conclusions and make inferences based on data
- **Review constructing, reading, & interpreting line & bar graphs and charts & tables
- *Choose the appropriate way(s) to organize data
- *Find mean, median, mode & range of data
- *Conduct simple probability experiments (games of chance) & make predictions
- **Review collecting, organizing, and interpreting data
- *Interpret circle graphs
- Develop using graphing software & spreadsheets to create graphs
- Introduce using tables or tree diagrams to list all possible outcomes of an event when order matters
- Introduce using fractions and percents to describe the probability of an event
- Develop using frequency tables with tally marks
- Develop an appreciation for the use of probability in the real world
- Introduce using data to develop & modify probability concepts

**5th Grade Mathematics Standards
Fayette County Public Schools**

Algebraic Ideas

INTERMEDIATE MATHEMATICS EXIT PERFORMANCE STANDARD 4: Student will apply algebraic ideas to predict, analyze, generalize and write rules for patterns involving change in numbers or shapes in problem solving situations and communicate the reasoning used in solving these problems.

Based on Kentucky's Core Content for Mathematics Assessment, the Kentucky Program of Studies, and Academic Expectations: 1.5-1.9 Mathematical Communication & Reasoning, 1.16 Technology, 2.7 Number, 2.8 Procedures, 2.9 Space and Dimensionality, 2.11 Change, 2.12 Structure; Goal 5 Think & Solve Problems; & Goal 6 Connect & Integrate Knowledge

5th Grade Algebraic Ideas Standards:

***AI/5.1 Use written rules to express relationships involving change (patterns, functions).**

Skills, Concepts, & Relationships

- *Use patterns & functions to represent & solve problems
- **Review graphing ordered pairs in the first quadrant of the Cartesian coordinate system (plot points)
- *Generalize a rule for ordered pairs (x/y coordinates)
- **Review describing, extending, analyzing & creating a wide variety of patterns in the real world
- *Solve and use open sentences (simple equations) as a beginning concept of variable using basic addition, subtraction, multiplication and division facts ($5 + _ = 7$ or $5 + n = 7$)
- Develop using variables to describe patterns
- Develop strategies for logical thinking, inductive and deductive reasoning

Intermediate Problem Solving Strategies

5th Grade Problem Solving Standards:

***PSS/5.1 Use an appropriate strategy to solve a problem correctly, completely support the mathematical decisions made with reasoning, and completely show/explain reasonableness of the answer**

***PSS/5.2 Communicate strategy and solution with accurate mathematical vocabulary and representations**

- *Use appropriate problem solving strategies:
 - act out
 - use manipulatives
 - draw a picture
 - describe and discuss a problem
 - look for a pattern
 - guess & check
 - make an organized list
 - draw a diagram
 - make and use a table
- *Communicate strategies and solutions (including math vocabulary and representations)
- *Select most appropriate strategy
- *Generate, extend, and solve multi-step story problems
- *Show/Explain reasonableness of answers

PRIMARY MATHEMATICS
EXIT PERFORMANCE STANDARDS
Fayette County Public Schools

Number/Computation

PRIMARY MATHEMATICS EXIT PERFORMANCE STANDARD 1:

Student will apply number sense, place value, and order relations for whole numbers up to 10,000 and simple fractions in problem solving situations to perform basic calculations involving addition, subtraction, and multiplication of whole numbers with and without calculators (know basic addition & subtraction facts to 18 and basic multiplication facts through 9's), and will communicate the reasoning used in solving these problems.

Geometry/Measurement

PRIMARY MATHEMATICS EXIT PERFORMANCE STANDARD 2:

Student will apply properties of measurement (length to $\frac{1}{2}$ ", weight/mass, temperature, time, money) and will use geometric concepts (plane 2D shapes, attributes, basic symmetry and congruence) and relationships in problem solving situations and communicate the reasoning used in solving these problems.

Probability/Statistics

PRIMARY MATHEMATICS EXIT PERFORMANCE STANDARD 3:

Student will use data collection, organization in basic graphs (bar graph, pictograph) and likely/unlikely outcomes in probability to solve real world problems and communicate the reasoning used in solving these problems.

Algebraic Ideas

PRIMARY MATHEMATICS EXIT PERFORMANCE STANDARD 4:

Student will apply algebraic ideas to sort objects and create, describe, and extend patterns of numbers or shapes in problem solving situations and communicate the reasoning used in solving these problems.

Based on Kentucky's Core Content for Mathematics Assessment, the Kentucky Program of Studies, and Academic Expectations: 1.5-1.9 Mathematical Communication & Reasoning, 1.16 Technology, 2.7 Number, 2.8 Procedures, 2.9 Space and Dimensionality, 2.10 Measurement, 2.11 Change, 2.12 Structure, 2.13 Probability & Statistics; Goal 5 Think & Solve Problems; & Goal 6 Connect & Integrate Knowledge