Grade Level Expectations
Grade 4 Mathematics

GLE 0406.1.1 Use mathematical language, symbols, and definitions while developing mathematical reasoning. (DOK Level 1)
GLE 0406.1.2 Apply and adapt a variety of appropriate strategies to problem solving, including estimation, and reasonableness of the solution. (DOK Level 4)
GLE 0406.1.3 Develop independent reasoning to communicate mathematical ideas and derive algorithms and/or formulas.
 (DOK Level 3)
GLE 0406.1.4 Move flexibly between concrete and abstract representations of mathematical ideas in order to solve problems, model mathematical ideas, and communicate solution strategies. (DOK Level 2)
GLE 0406.1.5 Use mathematical ideas and processes in different settings to formulate patterns, analyze graphs, set up and solve problems and interpret solutions. (DOK Level 3)
GLE 0406.1.6 Read and interpret the language of mathematics and use written/oral communication to express mathematical ideas precisely. (DOK Level 1)
GLE 0406.1.7 Recognize the historical development of mathematics, mathematics in context, and the connections between mathematics and the real world. (DOK Level 3)
GLE 0406.1.8 Use technologies/manipulatives appropriately to develop understanding of mathematical algorithms, to facilitate problem solving, and to create accurate and reliable models of mathematical concepts. (DOK Level 2)
- ✓ *0406.1.10 Use age-appropriate books, stories, and videos to convey ideas of mathematics.*

Unit 1 Place Value and Money
GLE 0406.2.1 Understand place value of numbers from hundredths to the hundred-thousands place. (DOK Level 1)

Unit 2 Operations
GLE 0406.2.2 Develop fluency with multiplication and single-digit division. (DOK Level 1)
GLE 0406.2.3 Identify prime and composite numbers. (DOK Level 1)

Unit 3 Algebra
GLE 0406.3.1 Extend understanding of a variable to equations involving whole numbers, fractions, decimals, and/or mixed numbers. (DOK Level 1)
GLE 0406.3.2 Use mathematical language and modeling to develop descriptions, rules and extensions of patterns. (DOK Level 4)
GLE 0406.3.3 Translate between different forms of representations of whole number relationships. (DOK Level 2)

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Unit 4 Measurement
GLE 0406.4.2 Understand and use measures of length, area, capacity, and weight. (DOK Level 1)
GLE 0406.4.3 Solve problems that involve estimating and measuring length, area, capacity, and weight. (DOK Level 3)

Unit 5 Fractions
GLE 0406.2.3 Identify prime and composite numbers. (DOK Level 1)
GLE 0406.2.4 Understand and use the connections between fractions and decimals. (DOK Level 2)
GLE 0406.2.5 Add and subtract fractions with like and unlike denominators. (DOK Level 1)
GLE 0406.2.6 Solve problems involving whole numbers, fractions and/or decimals using all four arithmetic operations.
(DOK Level 3)

Unit 6 Decimals
GLE 0406.2.4 Understand and use the connections between fractions and decimals. (DOK Level 2)
GLE 0406.2.6 Solve problems involving whole numbers, fractions and/or decimals using all four arithmetic operations.
(DOK Level 3)

Unit 7 Geometry
GLE 0406.4.1 Understand and use the properties of lines, segments, angles, polygons, and circles. (DOK Level 1)

Unit 8 Graphing & Probability
GLE 0406.5.1 Collect, record, arrange, present, and interpret data using tables and various representations. (DOK Level 3)
GLE 0406.5.2 Use probability to describe chance events. (DOK Level 2)
GLE 0406.4.4 Understand the representation of location and movement within the first quadrant of a coordinate system.
(DOK Level 3)

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Unit 1: Place Value and Money	Estimated time to complete: 2 weeks

Pre-check skills and knowledge: Place value and value of a digit up to 10,000. Word form and expanded form up to 10,000. Count coins and bill up to $5.00; determine change less than $1.00.

Unit Vocabulary: period, standard form, expanded form, word form, base ten, compare, digit, estimate, round, place value

Local I.D. #	Student Indicator	State Assessed	KCS Assessed	Resources
1	**SPI 0406.2.1 Read and write numbers from hundredths to hundred-thousands in numerals and in words.** (Focus on whole numbers. Decimals taught in Unit 6)	X	X	1.2, 2.1, 2.2 p. 6-8, 24-28
2	**SPI 0406.2.3 Identify the place value of a specified digit in a number and the quantity it represents.** ✓ 0406.2.1 Compose and decompose quantities according to place value, such as expanded form through hundred-thousands	X	X	1.2, 2.1, 2.2 p. 6-8, 24-28
KCO 1-3	**Round numbers to a given place value.**		X	2.5 p. 38-39
4	**SPI 0406.1.3 Determine the correct change from a transaction. (up to $20.00)**	X	X	2.3, 2.4 p. 30-36, 54

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Unit 2: Operations				Estimated time to complete: 6 weeks	
Pre-check skills and knowledge: Understanding of basic facts (addition, subtraction, multiplication, and division 0 – 9)					
Unit Vocabulary: sum, addend, difference, estimate, regroup, factor, product, quotient, divisor, dividend, remainder, prime number, composite number, common factor, multiples					
Local I.D. #	**Student Indicator**		**State Assessed**	**KCS Assessed**	**Resources**
KCO 2-1	**Use estimation to select a reasonable solution to a whole number computation involving addition and subtraction.** ✓ 0406.1.2 Identify the range of appropriate estimates, including over-estimate and under-estimate			X	3.2, 3.3, 3.4 p. 62 – 68
KCO 2-2	**Add and subtract multi-digit numbers (including solving contextual problems)** ✓ 0406.2.13 Solve multi-step problems of various types using whole numbers, fractions, and decimals.			X	3.5, 3.6, 3.7, 3.8 p. 70 - 78
3	**SPI 0406.2.11 Solve problems using whole number multi-digit multiplication.** ✓ 0406.2.7 Identify factors of whole numbers and model factors and products beyond basic multiplication facts using arrays and area models. ✓ 0406.2.3 Multiply two- and three-digit whole numbers.		X	X	6.1, 6.3, 6.4, 6.5, 6.6, 6.7 p. 146 -147, 150 - 157,160 – 162, 164 - 166 7.1, 7.3, 7.4, 7.5, 7.6 p. 172 – 173, 176 - 185

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4	**SPI 0406.2.12 Solve problems using whole number division with one- or two –digit divisors** ✓ 0406.2.10 Use models to understand division as the inverse of multiplication, partitioning, and repeated subtraction. ✓ 0406.1.9 Develop a story problem that illustrates a given multiplication or division number sentence. ✓ 0406.2.4 Understand and use a reliable algorithm for multiplying multi-digit numbers and dividing numbers by a single-digit divisor accurately and efficiently. ✓ 0406.2.5 Understand that division by zero is undefined. ✓ 0406.2.6 Divide three-digit whole numbers by one-digit divisors fluently with pencil and paper. ✓ 0406.2.14 Understand the role of the remainder in division	X	X	4.1, 4.2, 4.8, 4.9 p. 84 – 86, 88 – 89, 102 – 105 8.1, 8.2, 8.3, 8.4, 8.5, 8.6 p. 206 – 222 9.1, 9.2, 9.3, 9.4, 9.5 p. 228 – 242 11.1, 11.2, 11.3, 11.4, 11.5 p. 272 - 285
5	**SPI 0406.2.4 Find factors, common factors, multiples, and common multiples of two numbers.** ✓ 0406.2.7 Identify factors of whole numbers and model factors and products beyond basic multiplication facts using arrays and area models.	X	X	10.1, 10.2 p. 252 - 257
KCO 2-6	**Identify prime and composite numbers.**		X	10.2 p. 254 - 257

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Unit 3: Algebra				Estimated time to complete: 3 weeks
Pre-check skills and knowledge: commutative property, associative property, find missing values in simple equations, describe or extend geometric number patterns				
Unit Vocabulary: expression, parentheses, variable, equation, function table, Commutative Property, Associative Property, Distributive Property, Zero Property, Property of One				

Local I.D. #	Student Indicator	State Assessed	KCS Assessed	Resources
1	**SPI 0406.1.1 Verify a conclusion using the commutative, associative, and distributive properties.** ✓ 0406.1.4 Use commutative, associative, and distributive properties of numbers, including oral descriptions of mathematical reasoning.	X	X	3.1, 4.1, 4.7, 7.3 p. 60-61. 84-86, 100-101, 176 - 177
2	**SPI 0406.3.1 Use letters and symbols to represent an unknown quantity and write a simple mathematical expression.** ✓ 0406.3.2 Translate between symbols and words to represent quantities in expressions or equations. ✓ 0406.3.1 Find an unknown quantity in simple equations involving whole numbers, fractions, decimals, and/or mixed numbers. (focus on whole numbers/fractions, decimals and mixed numbers will be taught in Units 5 and 6)	X	X	5.2, 5.3, 5.4, 5.5 p. 112-124
3	**SPI 0406.3.3 Represent and analyze patterns using words, function tables, and graphs.** ✓ 0406.3.4 Translate between, symbolic, numerical, verbal, or pictorial representations of a whole number pattern or relationship.	X	X	5.6, p. 126-127, 129, 162
4	**SPI 0406.3.2 Make generalizations about geometric and numeric patterns (i.e. write the rule…)** ✓ 0406.3.3 Create, explain, and use a rule to generate terms of a pattern or sequence. .	X	X	5.6 p. 126 – 127, 216, 236 TMS

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Unit 4: Measurement	Estimated time to complete: 4 weeks

Pre-check skills and knowledge: elapsed time, measure length to nearest centimeter or _ inch, recognize common benchmark measurements, recognize appropriate units and tools for measuring

Unit Vocabulary: inch (in.), foot (ft), yard (yd), mile (mi), capacity, weight, gallons (gal), quarts (qt), pints (pt), cups (c), ounces (oz), pounds (lb), tons (T), centimeter (cm), millimeter (mm), decimeter (dm), meter (m), kilometer (km), liter (L), milliliter (ml), gram (g), kilogram (kg), year, calendar thermometer, degrees, Celsius, Fahrenheit, perimeter, area

Local I.D. #	Student Indicator	State Assessed	KCS Assessed	Resources
1	**SPI 0406.4.6 Determine situations in which a highly accurate measurement is important. (such as dosage of medicine, chemicals in a science experiment, area of floor to purchase carpet)**	X	X	TMS
2	**SPI 0406.1.4 Compare objects with respect to a given geometric or physical attribute and select appropriate measurement instrument. (such as given the drawing of a figure, which measurements are needed to find the perimeter? Which tool would you use to measure a certain object? Given a cup of liquid on a scale what is being measured?)** ✓ 0406.1.6 Identify geometric or physical attributes that are appropriate to measure in a given situation. ✓ 0406.4.13 Compare objects with respect to a given attribute such as length, area, and capacity. ✓ 0406.1.5 Measure using ruler, meter stick, clock, thermometer, or other scaled instruments. ✓ 0406.4.7 Measure liquids using both standard units and metric units.	X	X	12.1, 12.2, 12.3, 12.4, 12.6, 12.7, 12.8, 12.9 p. 306-314, 318-328 13.2, 13.4 p. 336-338, 344-346
3	**SPI 0406.4.7 Determine appropriate size/ *unit* of measurement in problem solving situations involving length, capacity or weight.**	X	X	Problem solving lessons p 308 – 314, 320 - 328

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4	**SPI 0406.4.8 Convert measurements within a single system that are common in daily life (e.g., hours and minutes, inches and feet, centimeters and meters, quarts and gallons, liters and milliliters).**	X	X	12.2, 12.3, 12.4, 12.7, 12.8, 12.9, 13.2 p. 308-315, 320-328, 336-339
5	**SPI 0406.4.9 Solve problems involving area and/or perimeter of rectangular figures.** ✓ 0406.4.8 Recognize that a measure of area represents the total number of same-sized units that cover the shape without gaps or overlaps. ✓ 0406.4.9 Recognize that area does not change when 2-dimensional figures are cut apart and rearranged. ✓ 0406.4.10 Connect area measure to multiplication using a rectangular area model. ✓ 0406.4.11 Estimate areas of rectangles in square inches and square centimeters. ✓ 0406.4.12 Estimate the size of an object with respect to a given measurement attribute (length, perimeter, area, or capacity).	X	X	18.1, 18.2, 18.3, 18.4 p. 452 - 462

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Unit 5: Fractions				Estimated time to complete: 4 weeks
Pre-check skills and knowledge: Recognize equivalent fractions, add and subtract fractions with like denominators				
Unit Vocabulary: fraction, numerator, denominator, equivalent fractions, simplest form, mixed number, proper fraction, improper fraction				

Local I.D. #	Student Indicator	State Assessed	KCS Assessed	Resources
1	**SPI 0406.2.5 Generate equivalent forms of common fractions and decimals and use them to compare size** (focus on fractions, decimals taught in Unit 6) ✓ 0406.2.8 Generate equivalent forms of whole numbers, decimals and common fractions (e.g., 1/10, _, _, _). ✓ 0406.2.11 Use benchmarks, and equivalent forms to compare fractions/decimals and locate them on the number line.	X	X	19.1, 19.2, 19.3 p. 490-497
2	**SPI 0406.2.6 Use the symbols <, > and = to compare common fractions and decimals in both increasing and decreasing order and *order fractions*.** ✓ 0406.2.9 Compare equivalent forms, whole numbers, fractions, and decimals to each other and to benchmark numbers ✓ Use benchmarks, and equivalent forms to compare fractions/decimals and locate them on the number line.	X	X	19.4 p. 498 – 501
3	**SPI 0406.2.2 Locate and place mixed numbers on the number line.**	X	X	19.7 p. 508 - 510
4	**SPI 0406.2.7 Convert improper fractions into mixed numbers and/or decimals.**	X	X	19.7 p. 508 – 510
5	**SPI 0406.2.8 Add and subtract proper fractions with like and unlike denominators and simplify the answer.** ✓ 0406.3.1 Find an unknown quantity in simple equations involving whole numbers, fractions, decimals, and/or mixed numbers.	X	X	20.1, 20.6, 20.7 p.496, 516 – 519, 528 - 532

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Unit 6: Decimals	Estimated time to complete: 3 weeks

Pre-check skills and knowledge: understanding of place value of whole numbers

Unit Vocabulary: decimal, decimal point, tenth, hundredth, equivalent decimals, decimal equivalent

Local I.D. #	Student Indicator	State Assessed	KCS Assessed	Resources
1	**SPI 0406.2.1 Read and write numbers from hundredths to hundred-thousands in numerals and in words.** ✓ 0406.1.8 Match the spoken, written, concrete (including base ten blocks), and pictorial representations of decimals. ✓ 0406.2.2 Understand decimal notation as an extension of the base-ten number system.	X	X	21.1, 21.3 p. 542 – 543, 546 -548
2	**SPI 0406.1.2 Compare decimals using concrete and pictorial representations** *and order decimals.*	X	X	21.6 p. 558- 559
3	**SPI 0406.2.5 Generate equivalent forms of common fractions and decimals and use them to compare size.** ✓ 0406.2.5 Generate equivalent forms of whole numbers, decimals, and common fractions. ✓ 0406.2.12 Understand and use decimal numbers up to hundredths and write them as fractions.	X	X	21.4 p. 550 - 552

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4	**SPI 0406.2.9 Add and subtract decimals through hundredths.** ✓ 0406.1.3 Connect operations with decimals to money and make estimates. ✓ 0406.3.1 Find an unknown quantity in simple equations using whole numbers, fractions, decimals, and mixed numbers.	X	X	22.1, 22.2, 22.3, 22.4 p. 568 – 575
5	**SPI 0406.2.10 Solve contextual problems using whole numbers, fractions, and decimals.** ✓ 0406.2.13 Solve multi-step problems of various types using whole numbers, fractions, and decimals. ✓ 0406.4.6 Recognize the use of decimals in metric measures.	X	X	22.5, p. 576 - 578 See word problems using fractions and decimals in Chapters 19, 20, 21,22 Word problems chapters 19, 20, 21,22 TMS

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Unit 7: Geometry		Estimated time to complete: 4 weeks			

Pre-check skills and knowledge: Identify line of symmetry

Unit Vocabulary: line segment, endpoints, parallel, intersecting, perpendicular, ray, angle, vertex, right angle, obtuse angle, acute angle, degrees, protractor, polygon, quadrilateral, right triangle, obtuse triangle, acute triangle, circle, radius, chord, diameter, rotation, reflection, translation, transformation, symmetry, line of symmetry, rotational symmetry, net

Local I.D. #	Student Indicator	State Assessed	KCS Assessed	Resources
1	**SPI 0406.4.1 Classify lines and line segments as parallel, perpendicular, or intersecting**	X	X	16.1 p. 404 - 407
2	**SPI 0406.4.4 Identify acute, obtuse, and right angles in 2-dimensional shapes.** ✓ 0406.4.3 Classify angles and triangles as obtuse, acute, or right. ✓ 0406.4.4 Measure and draw angles.	X	X	16.2 p. 408-409 16.3 p. 410-411 16.5 p. 416-417
3	**SPI 0406.4.5 Identify attributes of simple and compound figures composed of 2- and 3- dimensional shapes.** ✓ 0406.4.1 Identify the basic parts of circles. ✓ 0406.4.2 Understand the definition of degree as it relates to the circle. ✓ 0406.4.5 Determine if a figure is a polygon. ✓ 0406.4.21 Recognize two-dimensional faces of three-dimensional shapes.	X	X	16.4 p. 412-414 16.7 p. 422-424 18.5 p. 464-467

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4	**SPI 0406.4.10 Identify images resulting from reflections, translations, or rotations.** ✓ 0406.4.17 Predict the results of a transformation of a geometric shape. ✓ 0406.4.18 Determine whether a geometric shape has line and/or rotational symmetry. ✓ 0406.4.19 Design and analyze simple tilings and tessellations. ✓ 0406.4.20 Draw lines of symmetry in 2-dimensional figures.	X	X	17.2 p. 434-435 17.4 p. 440-443 p. 434-435
5	**SPI 0406.4.2 Graph and interpret points with whole number or letter coordinates on grids or in the first quadrant of the coordinate plane.** ✓ 0406.4.14 Explain how the components of a coordinate system are used to determine location. ✓ 0406.4.15 Explore properties of paths between points.	X	X	24.1, 24.2, 24.3 p. 616 - 622
6	**SPI 0406.4.3 Construct geometric figures with vertices at points on a coordinate grid.** ✓ 0406.4.16 Examine transformations in the coordinate plane.	X	X	17.2 p. 434 -435 TMS

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Unit 8: Graphing and Probability				Estimated time to complete: 3 weeks	
Pre-check skills and knowledge: Recognize and interpret frequency tables, bar graphs, pictographs or line plots, make predictions based on data					
Unit Vocabulary: data, survey, table, mean, median, mode, range, stem – and – leaf plot, double bar graph, interval, line graph, bar graph, circle graph, pictograph, probability, outcome, prediction, tree diagram					
Local I.D. #	**Student Indicator**		**State Assessed**	**KCS Assessed**	**Resources**
1	**SPI 0406.5.1 Depict data using various representations (e.g., tables, pictographs, line graphs, bar graphs).** ✓ 0406.5.1 Create and label appropriate scales for graphs. ✓ 0406.5.2 Evaluate how well various representations show the collected data. ✓ 0406.5.3 Interpret and prepare pie charts using appropriate measurements of angles. ✓ 0406.5.4 Develop and use stem-and-leaf plots.		X	X	14.1, 14.2. 14.5 p. 356 – 362, 368-370 15.1,15.2, 15.3, 15.4, 15.5 p. 376 - 386
2	**SPI 0406.5.2 Solve problems using estimation and comparison within a single set of data.**		X	X	See problem solving in Chapters 14 and 15
3	**SPI 0406.5.3 Given a set of data or a graph, describe the distribution of data using median, range, or mode.** ✓ 0406.5.5 Use measures of central tendency to compare two sets of related data.		X	X	14.3, 14.4 p. 364 - 367
4	**SPI 0406.5.4 List all possible outcomes of a given situation or event.** ✓ 0406.5.6 Determine a simple probability. ✓ 0406.5.7 Express a probability pictorially.		X	X	23.1, 23.2, 23.3, 23.4, 23.5 p 596 - 610

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Unit 1	<u>**Unit 2**</u>
Literature Resources:	**Literature Resources:**
Materials/Manipulatives:	**Materials/Manipulatives:**
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Unit 3	Unit 4
Literature Resources:	**Literature Resources:**
Materials/Manipulatives: •	**Materials/Manipulatives:** •

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Unit 5	Unit 6
Literature Resources:	**Literature Resources:**
Materials/Manipulatives: •	**Materials/Manipulatives:** •

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Unit 7	Unit 8
Literature Resources:	**Literature Resources:**
Materials/Manipulatives: •	**Materials/Manipulatives:** •

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Professional Resources:	Technology:
About Teaching Mathematics by Marilyn Burns	www.stemresources.com
Teaching Arithmetic: Lessons for Introducing Multiplication by Marilyn Burns	www.aimsedu.org
Lessons for Introducing Division, Grades 3-4 by Math Solutions	www.coolmath-games.com
Marvelous Multiplication and Dazzling Division, grades 4-5 by AIMS	www.quiz-tree.com
Navigating Through Algebra, Grades 3-5 by NCTM Publications	www.eduplace.comkids/mqw
Lessons for Algebraic Thinking, Grades 3-5 by Math Solutions	www.globalclassroom.org
Teaching Arithmetic: Lessons for Introducing Fractions, Grades 4-5 by Math Solutions	www.lessonplanspage.com/Math.htm
Fabulous Fractions, Grades 3-9 by AIMS	www.funbrain.com
Math By All Means: Geometry, Grades 3-4 by Math Solutions	www.unitedstreaming.com
*Math By All Means: Probability***, *Grades 3-4* by Math Solutions	www.coolmath4kids.com
Sizing Up Measurement, Grades 3-5 by Chris Confer	www.aplusmath.com
Solve It! 4th Grade by AIMS	www.gamequarium.com
Problem Solver II Grade 4 by Creative Publications	www.learningplanet.com
Uncovering Math with Manipultives, the TI-10 and the TI-15 Explorer by Texas Instruments	www.primarygames.com/math.htm
A Guide for Teachers: TI-15 by Texas Instruments	www.internet4classrooms.com/skills
Dinah Zike's Big Book of Math, Elementary K-6 by Dinah Zike	www.netrover.com/~kingskid/108.html
Math and Literature, Grades 4-6 by Rusty Bresser	www.compusage.com/Home/Batterup.aspzx
	www.edu4kids.xom
	www.aaamath.com
	www.teachteachers.com/mathweb/literatureandmath.htm
	www.nctm.org
	www.mathgoodies.com
	www.factmonster.com/index.html
	www.visualfractions.com
	www.yahooliganx.com
	www.abc.net.au/learn
	www.pbs.org/teachersource/math.htm
	www.education.ti.com
	www.illuminations.nctm.org/index.html
	www.edm.org
	www.matti.usu.edu/nlvm/nav/vlibrary.html
	www.mathforum.org/livrary/drmath/sets/elem,.com
	http://thinkquest.org/

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