Correlation of Saxon *Math-4* (2e)
to the 2008 Arizona Grade 4 Mathematics Standard

Every student should understand and use all concepts and skills from the previous grade levels. The standard is designed so that new learning builds on preceding skills. Communication, Problem-solving, Reasoning & Proof, Connections, and Representation are the process standards that are embedded throughout the teaching and learning of all mathematical strands.

Strand 1: Number and Operations

Number sense is the understanding of numbers and how they relate to each other and how they are used in specific context or real-world application. It includes an awareness of the different ways in which numbers are used, such as counting, measuring, labeling, and locating. It includes an awareness of the different types of numbers such as, whole numbers, integers, fractions, and decimals and the relationships between them and when each is most useful. Number sense includes an understanding of the size of numbers, so that students should be able to recognize that the volume of their room is closer to 1,000 than 10,000 cubic feet. Students develop a sense of what numbers are, i.e., to use numbers and number relationships to acquire basic facts, to solve a wide variety of real-world problems, and to estimate to determine the reasonableness of results.

Concept 1: Number Sense

Understand and apply numbers, ways of representing numbers, and the relationships among numbers and different number systems.

In Grade 4, students build on their prior knowledge of whole numbers, fractions, and decimals, making connections with percents. They also make connections between decimal notation and the base ten system. Students develop an understanding of how various representations for fractions, decimals, and percents are related.

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 1. Express whole numbers, fractions, decimals, and percents using and connecting multiple representations. Lesson 1 (writing a part of a set as a fraction) Lesson 4 (creating 3-digit numbers) Lesson 17 (identifying fractional parts of one whole to twelfths) Lesson 25 (identifying place value of 3-digit numbers) Lesson 27 (number line w/ fractions, whole & mixed numbers) Lesson 28 (measure & draw line segments to 1/16 of an inch) Lesson 31 (3-digit numbers using words for writing checks) Lesson 51 (reading large numbers)	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. Connections: M04-S1C1-03, M04-S1C1-04, M04-S1C1-05, M04-S1C2-01, M04-S1C3-01, M04-S2C2-01, M04-S4C4-02	Students write fractions and decimals (limited to hundredths). They connect models of fractions and decimals to symbols and then locate the equivalent symbols on a number line. Models may include base ten blocks, place value charts, grids, pictures, fraction manipulatives, etc. Continued on next page

The bulleted items within a performance objective indicate the specific content to be taught.

Correlation of Saxon *Math-4* (2e)
to the 2008 Arizona Grade 4 Mathematics Standard

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
Lesson 53 (identify place value of a digit in a large number) Lesson 53 (writing large numbers in expanded form) Lesson 68 (writing equivalent fractions) Lesson 78 (mixed numbers as improper fractions) Lesson 79 (pictures of mixed numbers & improper fractions) Lesson 84 (changing improper fractions to mixed numbers) Lesson 88 (writing common and decimal fractions for tenths) Lesson 95 (picturing decimal fractions to the hundredths)		Using 10 x10 grids give students opportunity to recognize that ½ = 0.5 = 0.50 as ½ of the grid can be shaded which can also be seen as 5/10 or 50/100 as well as 50% of the grid. Reading decimals such as 0.36 as "36 hundredths" while writing this also in fraction form, 36/100, helps reinforce the concept that decimals are fractions. Models of decimals and fractions may also be connected to metric measurement.
PO 2. Compose and decompose whole numbers using factors and multiples. Lesson 26 (identifying factors and products) Lesson 29 (identifying and writing multiples) Lesson 94 (identifying prime numbers to 100) Lesson 107 (identify the factors of a number; identify a GCF) Lesson 116 (identifying perfect squares) Lesson 122 (identifying square roots of perfect squares) Lesson 128 (identifying cube roots of perfect cubes)	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection. M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. Connections: M04-S1C2-03	Students are expected to determine the factors and multiples of whole numbers to 144. Models should be used to factor numbers and develop understanding of the meaning of the factors. Drawing pictures and recording the mathematics representation of the models is important. Examples: • To factor 12, group 12 objects into 3 groups of 4 to represent 3 x 4 or into 3 groups of 2 groups of 2 to represent 3 x (2 X 2). • Students can use cubes to build 5 groups of 3 to represent 15. They can also build the 5 groups of 3 two times to represent 2 x (5 x 3) and then count 10 groups of 3 (10 x 3) or 30 cubes total.

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Correlation of Saxon *Math-4* (2e)
to the 2008 Arizona Grade 4 Mathematics Standard

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 3. Express fractions as fair sharing, parts of a whole, parts of a set, and locations on a real number line. Lesson 1 (writing a part of a set as a fraction) Lesson 17 (identifying fractional parts of one whole to twelfths) Lesson 27 (number line w/ fractions, whole & mixed numbers) Lesson 28 (measure & draw line segments to 1/16 of an inch) Lesson 68 (writing equivalent fractions using halves, quarters, fourths, eighths, sixteenths) Lesson 78 (mixed numbers as improper fractions) Lesson 79 (showing mixed numbers and improper fractions using pictures) Lesson 83 (write remainders in division as fractions) Lesson 84 (changing improper fractions to mixed numbers) Lesson 106 (finding the fractional part of a set)	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. Connections: M04-S1C1-01, M04-S1C1-05	Fair sharing - Pictures work better for representing fair sharing problems since students often need to represent fractional parts. Examples: • Three sub sandwiches are shared among 2 friends. Each person gets $1\frac{1}{2}$ sub sandwiches. • Three sub sandwiches are shared among 4 friends. Each person gets $\frac{3}{4}$ of a sub sandwich. Parts of a set - Objects that students can group and regroup should be used as a starting point for representing parts of a set. Example: • Tanya has 24 stickers. She took $\frac{3}{4}$ of the stickers to school. How many did she take to school? In this example students can use 24 objects, break that into 4 groups and represent 3 of the 4 groups.
PO 4. Compare and order decimals to hundredths. Lesson 68 (ordering unit fractions, writing equivalent fractions) Lesson 88 (writing common and decimal fractions for tenths) Lesson 91 (picturing decimal fractions to the tenth) Lesson 95 (picturing decimal fractions to the hundredths) Lesson 118 (write common and decimal fractions as percents)	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. Connections: M04-S1C1-01, M04-S1C3-01	Students need to understand the size of decimal numbers and relate them to common benchmarks such as 0, $\frac{1}{2}$ as 0.5 or 0.50, and 1. They also need to develop an understanding of the equivalence of numbers such as 0.8 and 0.80 before they are asked to compare tenths to hundredths. Continued on next page Students begin by comparing 10ths only. Counting by 10ths,

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Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
		shading in 10ths on a 10x10 grid, and locating 10ths on a number line will give them a solid foundation. Recognizing that 0.5 is $\frac{1}{2}$ is imperative as students can reason that 0.7 is more than $\frac{1}{2}$ and 0.3 is less than $\frac{1}{2}$. Once students have a firm understanding of 10ths, they should experience similar activities to compare hundredths. Only after students have had opportunities to compare tenths to tenths and hundredths to hundredths should they compare tenths to hundredths.
PO 5. Use simple ratios to describe problems in context. Lesson 1 (finding a fractional part of a set) Lesson 106 (writing part of a set as a fraction)	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. Connections: M04-S1C1-01, M04-S1C1-03, M04-S2C2-01	A ratio compares the relationship between two quantities. Ratios can compare the same types of measures or compare different types of measures. In Grade 4, students will learn about ratios that compare the same type of measures. There are two ways to compare the measures. Examples: • Part-to-whole: the number of blue crayons to the total number of crayons in a box • Part-to Part: the number of blue crayons to the number of red crayons There are three different ways to write ratios. Example: • The ratio for 4 blue crayons to 3 red crayons can be written as: 4 to 3, 4:3, or $\frac{4}{3}$.

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Correlation of Saxon *Math-4* (2e) to the 2008 Arizona Grade 4 Mathematics Standard

Strand 1: Number and Operations
Concept 2: Numerical Operations

Understand and apply numerical operations and their relationship to one another.

In Grade 4, students apply strategies to add and subtract decimals and fractions with like denominators and fluently use multiplication and related division facts. They solve problems that require multiplication and division of whole numbers, application of properties, and order of operations.

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 1. Add and subtract decimals through hundredths including money to $1000.00 and fractions with like denominators. DECIMALS/MONEY: Lesson 41 (adding whole numbers and money amounts) Lesson 42 (filling out a catalog form) Lesson 55 (making change from $1.00) Lesson 63 (making change from $10.00) Lesson 66 (subtract whole numbers and money amounts) Lesson 91 (picturing decimal fractions: tenths) Lesson 95 (picturing decimal fractions: hundredths) FRACTIONS: Lesson 96 (simplifying fractions) Lesson 102 (add and subtract fractions w/ like denominators) Lesson 109 (simplify fractions using greatest common factor) Additionally: Lesson 127 (add & subtract fractions w/ unlike denominators)	M04-S5C2-04. Determine whether a problem to be solved is similar to previously solved problems, and identify possible strategies for solving the problem. M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. M04-S5C2-07. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question. Connections: M04-S1C1-01, M04-S1C2-06, M04-S1C3-02, M04-S5C1-01, SS04-S5C1-01	If students understand place value and the connection between decimals and fractions, the reasons for lining up decimal points, counting decimal places, and moving the decimal point in the divisor and dividend will make more sense. An important concept of addition and subtraction of decimals and fractions is that 10ths can only be added to or subtracted from 10ths, 100ths to and from 100ths, as well as 4ths to and from 4ths, etc. Adding by using the counting on strategy can help students understand these important concepts and lay the foundation for understanding the need to line up decimals points and why denominators are not added when we add fractions. Examples: • 0.5 + 0.3; count up from 0.5 (0.6, 0.7, 0.8) • 8/12 – 5/12; count back from 8/12 (7/12, 6/12, 5/12, 4/12, 3/12) • 0.4 + 0.03; can't count until both are the same so 0.40 + 0.03 allows counting up by hundredths (0.41, 0.42, 0.43) Continued on next page In addition, students should become accustomed to making

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Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
		estimates before they begin actual computation. Estimating is especially helpful when students try to add or subtract decimals with different numbers of decimal places. Example: • Johnny's watering can holds 1.50 liters of water. He watered his plants and used 0.85 liter. How much water is left in his watering can?
PO 2. Use multiple strategies to multiply whole numbers • two-digit by two-digit and • multi-digit by one-digit. Lesson 36 (by 10 through 10,000 using mental computation) Lesson 38 (2-digit by 1-digit numbers w/ mental computation) Lesson 49 (2-digit by 1-digit numbers using an algorithm) Lesson 54 (3- & 4-digit by 1-digit numbers w/ an algorithm) Lesson 73 (multiplying a 2-digit by a 2-digit number) Lesson 80 (multiplying a 3-digit by a 2-digit number) Lesson 97 (multiply by a multiple of 10, 100, or 1,000) Lesson 120 (finding the percent of a number) Lesson 123 (multiplying money amounts) Lesson 125 (doubling a recipe)	M04-S5C2-04. Determine whether a problem to be solved is similar to previously solved problems, and identify possible strategies for solving the problem. M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. M04-S5C2-07. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question. Connections: M04-S1C2-03, M04-S1C2-05, M04-S1C2-06, M04-S1C3-02, M04-S3C3-02, M04-S5C1-01	Computation strategies for multiplying whole numbers are more complicated than those used for addition. Students who develop flexibility in breaking numbers apart have a better understanding of the importance of place value and the distributive property in multi-digit multiplication. Students may use base ten blocks, area models, partitioning, compensation strategies, etc. when multiplying whole numbers. Examples: • 54 X 6 = (50 X 6) + (4 X 6) = 300 + 24 = 324 • 25 x24 400 (20 x 20) 100 (20 x 5) 80 (4 x 20) 20 (4 x 5) 600 • 25 x24 500 (20 x 25) 100 (4 x 25) 600 Continued on next page

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Correlation of Saxon *Math-4* (2e) to the 2008 Arizona Grade 4 Mathematics Standard

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
		• 20 5 20 | 400 | 100 | 500 4 | 80 | 20 | 100 480 + 120 | 600
PO 3. Demonstrate fluency of multiplication and division facts through 12. Lesson 22 (multiplying by 1, 5, 7, 10, and 12) Lesson 26 (multiplying by 0, 2, 4, 6, and 8) Lesson 30 (multiplying by 3, 9, and 11) Lesson 60 (making and writing number sentences for arrays) Lesson 62 (writing division problems, dividing by 2 and 5) Lesson 76 (divisor, dividend, quotient; writing remainders) Lesson 77 (dividing a 2-digit number by a 1-digit number)	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection. Connections: M04-S1C1-02, M04-S1C2-02, M04-S1C2-04	In Grade 3, students developed conceptual understanding of multiplication facts. It is important that early in Grade 4, students are given many experiences to solidify these facts as knowing them enhances their ability to be successful with multiplication and division.
PO 4. Use multiple strategies to divide whole numbers. Lesson 62 (writing division problems) Lesson 76 (divisor, dividend, quotient; writing remainders) Lesson 77 (dividing a 2-digit number by a 1-digit number) Lesson 83 (writing remainders for division as fractions) Lesson 87 (dividing a 3-digit number by a 1-digit number) Lesson 101 (dividing a 4-digit number by a 1-digit number) Lesson 123 (dividing money amounts)	M04-S5C2-04. Determine whether a problem to be solved is similar to previously solved problems, and identify possible strategies for solving the problem. M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. M04-S5C2-07. Analyze and evaluate whether a solution is	Students use invented ways for solving division problems in addition to the traditional algorithm. Division problems should represent: • partition or fair-sharing (Sharing 80 among 4 or making 4 groups of 20.) • repeated subtraction (Determining how many 4s are in 80 or making 20 groups of 4.) Students will be expected to know that a remainder can be expressed as either a number that cannot be subdivided or as a fraction, depending upon the context.

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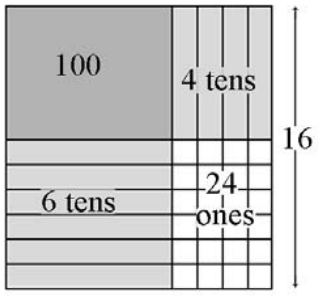
Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
	reasonable, is mathematically correct, and answers the question. Connections: M04-S1C2-03, M04-S1C2-05, M04-S1C2-06, M04-S1C3-02, M04-S3C3-02, M04-S5C1-01	Examples: • Share 25 books among 4 girls (6 with a remainder of 1) • Share 25 bananas among 4 girls. (6 ¼) Continued on next page Examples of possible strategies: • 79 ÷ 3 can be thought of as (75 + 4) ÷ 3. There are 25 threes in 75, 1 more 3 in the 4 with a reminder of 1 so 79 ÷ 3 is 26, R 1) • 750 ÷ 6 can be thought of as (600 + 120 + 30). Dividing each group by 6 results in 100 + 20 + 5 or 125.
PO 5. Apply associative and distributive properties to solve multiplication and division problems. Lesson 6 (mental addition of multiples of 10–10,000) Lesson 23 (draw pictures & write number sentences for equal group stories) Lesson 26 (identify commutative property of multiplication) Lesson 38 (multiplying three single-digit numbers)	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection. Connections: M04-S1C2-02, M04-S1C2-04, M04-S1C2-06, M04-S5C1-01	The distributive property is applied in the area model below. The model shows the partial products. 14 x 16 = 224  100 + 40 + 60 + 24 = 224

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 6. Apply order of operations with whole numbers. Lesson 117 (using the order of operations)	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection. Connections: M04-S1C2-01, M04-S1C2-02, M04-S1C2-04, M04-S1C2-05, M04-S5C1-01	Students apply order of operations (Parentheses, Multiply or Divide, Add or Subtract). Students are not expected at this grade level to work with numerical expressions that have exponents. Example: • (4 + 2) + 1 x 3 = 6 + 1 x 3 = 6 + 3 = 9

Strand 1: Number and Operations
Concept 3: Estimation

Use estimation strategies reasonably and fluently while integrating content from each of the other strands.

In Grade 4, students apply benchmarks in estimation of whole numbers, decimals, and fractions.

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		

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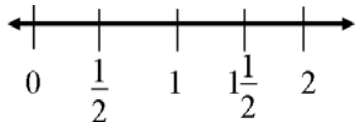
Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 1. Use benchmarks as meaningful points of comparison for whole numbers, decimals, and fractions. Lesson 18 (estimating and measuring length) Lesson 27 (labeling a number line using whole numbers, fractions, and mixed numbers) Lesson 39 (estimating and measuring distance) Lesson 43 (estimate/measure map distances using a scale) Lesson 72 (estimating and finding the mass of an object)	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection. M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. Connections: M04-S1C1-01, M04-S1C1-04, M04-S1C3-02, M04-S2C2-01, M04-S4C4-02	Fraction and decimal benchmarks include zero, quarter, half, and whole numbers. Whole number benchmarks include 5, 10s, 25, 75, 100s, and 1000s. Students should be able to make comparisons between and among fractions, decimals, and whole numbers interchangeably. Example: • Using the number line, find which benchmark number is o about 1.88? o about $\frac{5}{6}$? 
PO 2. Make estimates appropriate to a given situation or computation with whole numbers and fractions. Lesson 13 (estimating the sum of two 2-digit numbers) Lesson 18 (estimating and measuring length) Lesson 33 (estimating sums of 2- and 3-digit numbers) Lesson 38 (estimating a product) Lesson 39 (estimating and measuring distance) Lesson 43 (estimate/measure distance on a map using a scale) Lesson 72 (estimating and finding the mass of an object) Lesson 74 (reading a thermometers using Fahrenheit and Celsius scale and Estimate temperatures) Lesson 119 (rounding a number) Lesson 122 (approximating square roots) Lesson 130 (estimating sales tax)	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection. M04-S5C2-04. Determine whether a problem to be solved is similar to previously solved problems, and identify possible strategies for solving the problem. M04-S5C2-07. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question.	Students estimate using all four operations with whole numbers and fractions as appropriate. Requiring students to estimate mentally reinforces an understanding of the operations and develops a habit of examining numbers and their relationships before computing. Continued on next page Estimation skills include identifying when estimation is appropriate, determining the level of accuracy needed, selecting the appropriate method of estimation, and verifying solutions or determining the reasonableness of situations using various estimation strategies. Estimation strategies for calculations with fractions extend from students' work with whole number operations. Estimation strategies include, but are not limited to: • front-end estimation with adjusting (using the highest

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Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
	Connections: M04-S1C2-01, M04-S1C2-02, M04-S1C2-04, M04-S1C3-01, M04-S2C1-02, M04-S2C3-01, M04-S2C4-03, M04-S3C1-02, M04-S3C3-02, M04-S3C4-01, M04-S4C4-01, M04-S4C4-02, M04-S4C4-03, M04-S4C4-04, M04-S4C4-05, M04-S5C1-01	place value and estimating from the front end making adjustments to the estimate by taking into account the remaining amounts), • clustering around an average (when the values are close together an average value is selected and multiplied by the number of values to determine an estimate), • rounding and adjusting (students round down or round up and then adjust their estimate depending on how much the rounding affected the original values), • using friendly or compatible numbers such as factors (students seek to fit numbers together - i.e., rounding to factors and grouping numbers together that have round sums like 100 or 1000), and • using benchmark numbers that are easy to compute (students select close whole numbers for fractions or decimals to determine an estimate). Specific strategies also exist for estimating measures. Students should develop fluency in estimating using standard referents (meters, yard, etc) or created referents (the window would fit about 12 times across the wall).

Strand 2: Data Analysis, Probability, and Discrete Mathematics
This strand requires students to use data collection, data analysis, statistics, probability, systematic listing and counting, and the study of graphs. This prepares students for the study of discrete functions as well as to make valid inferences, decisions, and arguments. Discrete mathematics is a branch of mathematics that is widely used in business and industry. Combinatorics is the mathematics of systematic counting. Vertex-edge graphs are used to model and solve problems involving paths, networks, and relationships among a finite number of objects.

Concept 1: Data Analysis (Statistics)

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Understand and apply data collection, organization, and representation to analyze and sort data.

In Grade 4, students continue to build their data collection tools from previous grade levels. They collect data and create bar, line, and circle graphs to display data. Students analyze data displays by formulating and answering questions.

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 1. Collect, record, organize, and display data using double bar graphs, single line graphs, or circle graphs. Lesson 2 (making a pictograph) Lesson 3 (making a frequency table & bar graph) Lesson 10 (representing data on a graph) Lesson 20 (creating a line plot) Lesson 35 (designing and constructing a survey) Lesson 40 (drawing a circle graph) Lesson 43 (making a table to solve a problem) Lesson 48 (making a Venn diagram) Lesson 50 (drawing a pictograph) Lesson 104 (making a line graph) Lesson 112 (making a stem-and-leaf plot)	M04-S5C2-08. Make and test conjectures based on data (or information) collected from explorations and experiments. Connections: M04-S2C1-02, M04-S4C3-02, SC04-S1-C2-05, SC04-S1C4-02, SS04-S4C1-04	Students begin to grapple with choosing the most appropriate data display for specific data. • Double bar graphs can be used to display two sets of related data. • Single line graphs are used to show change in data over time. • Circle graphs can be used to show relationships to the whole. A circle graph also can show data in percent form. Students need opportunities to determine how to display data including choosing appropriate units of measure and a scale for the graphs. Working with data that includes fractions and decimals will reinforce student's understanding of these concepts.

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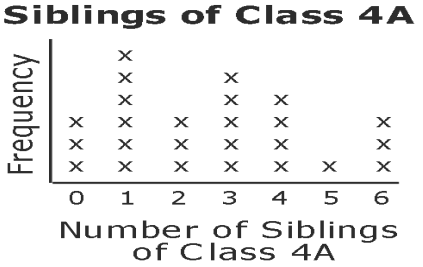
Correlation of Saxon *Math-4* (2e)
to the 2008 Arizona Grade 4 Mathematics Standard

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 2. Formulate and answer questions by interpreting and analyzing displays of data, including double bar graphs, single line graphs, or circle graphs. Lesson 3 (collecting information from a survey and make a frequency table and bar graph to show data) Lesson 10 (representing data on a graph) Lesson 12 (reading a chart) Lesson 20 (reading a line plot) Lesson 35 (designing and constructing a survey) Lesson 40 (reading a circle graph) Lesson 43 (making a table to solve a problem) Lesson 48 (reading a Venn diagram) Lesson 50 (reading a pictograph)	M04-S5C2-02. Identify relevant, missing, and extraneous information related to the solution to a problem. M04-S5C2-06. Summarize mathematical information, explain reasoning, and draw conclusions. Connections: M04-S1C3-02, M04-S2C1-01, M04-S2C1-03, M04-S2C1-04, M04-S3C4-01, SC04-S1C1-02, SC04-S1C1-03, SC04-S1C3-01, SC04-S1C3-02, SC04-S1C3-04, SC04-S1C3-05, SS04-S1C1-01, SS04-S2C1-01, SS04-S4C6-03	
PO 3. Use median, mode, and range to describe the distribution of a given data set. Lesson 20 (identifying range and mode of a set of data) Lesson 90 (finding the mean of a set of data) Lesson 112 (finding the median of a set of data)	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. M04-S5C2-06. Summarize mathematical information, explain reasoning, and draw conclusions. Connections: M04-S2C1-02, M04-S2C1-04	Since this is a first exposure to these measures of center, it is important that students have many experiences collecting data and interpreting the data based on these measures. Example: • Collect data on the birth month of each student. After each student writes one number from 1-12 to represent their birth date, they can line up from 1-12. Pairing off the students from the ends will give the median. If the last pair has two 5s, then this median of 5 means there were more students born in the first half of the year than in the second half. Students can count to verify this. If the median is 6 ½ then the same number of students were born in each time frame To find the mode, the students can physically make a bar graph so that all 1s are in a column, all 2s in a column, etc. If the 7s column

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
		has the most, then the mode is 7 which means that more students were born in the 7th month or in July. The range in this context would indicate that from the 1st month to the last month there is a difference of 11 months. Continued on next page Median: To find the median, list the data in order from least to greatest. If the set has an odd number of data points, find the number in the middle. • (3, 4, 6, 8, 9) Median: 6 If the data set has an even number of data points, the median will be halfway between the two data points in the center of the set. • (15, 22, 34, 35, 44, 45) Median: 34.5 or $34\frac{1}{2}$ Mode: To find the mode, find the number that occurs most often in the set. A set may have more than one mode. • (129, 134, 134, 156, 167, 171, 171) Modes: 134, 171 Range: To find the range, subtract the smallest number in the Set from the greatest number in the set. • (25, 26, 28, 35, 37, 39) Range: 39-25 = 14 Students should be able to describe the distribution of data in sets of data and in data displays. • Use the frequency graph to find the median, mode, and range of the number of siblings for Class 4A.

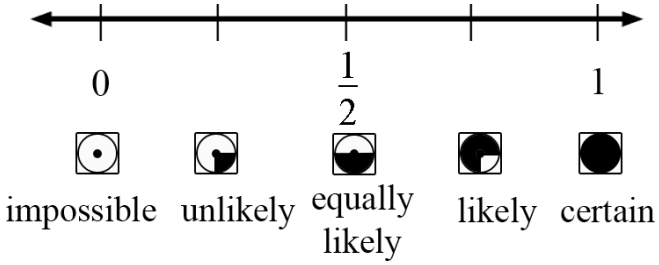
Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
		 Solution**:** Median = 3 Range = 6 Mode = 1
PO 4. Compare two sets of related data. Lesson 104 (making a line graph) Lesson 112 (making a stem-and-leaf plot)	M04-S5C2-02. Identify relevant, missing, and extraneous information related to the solution to a problem. M04-S5C2-06. Summarize mathematical information, explain reasoning, and draw conclusions. Connections: M04-S1C2-02, M04-S1C2-03, M04-S2C1-03, SC04-S1C4-03	Besides comparing double line graphs, students should be given experiences to compare circle graphs to circle graphs and line graphs to line graphs that display similar kinds of data. Included in these comparisons should be examination of the median, mode and range of these data where appropriate. (M04-S2C1-03)

Strand 2: Data Analysis, Probability, and Discrete Mathematics
Concept 2: Probability

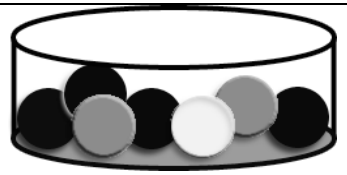
Understand and apply the basic concepts of probability.

In Grade 4, students focus on the fundamental elements of theoretical probability.
The bulleted items within a performance objective indicate the specific content to be taught.

Correlation of Saxon *Math-4* (2e) to the 2008 Arizona Grade 4 Mathematics Standard

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 1. Describe elements of theoretical probability by listing or drawing all possible outcomes of a given event and predicting the outcome using word and number benchmarks. Lesson 100 (identifying the probability of an event) Lesson 115 (finding the probability of an event)	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. M04-S5C2-06. Summarize mathematical information, explain reasoning, and draw conclusions. Connections: M04-S1C1-01, M04-S1C1-05, M04-S1C3-01	Students should predict outcomes of everyday events such as • On a school day, the morning bell will ring at 8:00 am. • You will have two birthdays this year. In addition, students should list all the possible outcomes for several types of events, including spinning a spinner, pulling colored cubes from a bag of colored cubes, etc. Continued on next page Probability can be expressed in terms such as impossible, unlikely, likely, or certain or as a number between 0 and 1. The number line below illustrates these ideas.  Example: • The container below contains gray, white, and black marbles. Without looking, if you choose a marble from the container, will the probability be closer to 0 or to 1 that you will select a white marble? A gray marble?

The bulleted items within a performance objective indicate the specific content to be taught.

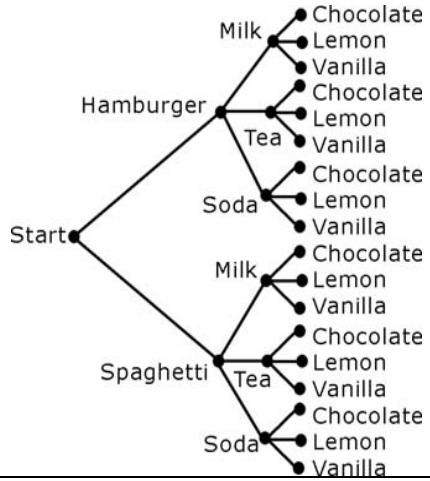
Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
		

Correlation of Saxon *Math-4* (2e)
to the 2008 Arizona Grade 4 Mathematics Standard

Strand 2: Data Analysis, Probability, and Discrete Mathematics
Concept 3: Systematic Listing and Counting

Understand and demonstrate the systematic listing and counting of possible outcomes.

In Grade 4, students focus on constructing tree diagrams to solve systematic listing and counting problems.

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 1. Construct tree diagrams to solve problems in context by • representing all possibilities for a variety of counting problems, • explaining how its properties relate to the problem, • representing the same counting problem in multiple ways, and • drawing conclusions. Lesson 4 (make an organized list to solve a problem)	M04-S5C2-02. Identify relevant, missing, and extraneous information related to the solution to a problem. M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. Connections: M04-S1C3-02, M04-S2C3-02	Students use tree diagrams to solve problems such as finding the number of outfits that can be made from four shirts, three pairs of shorts, and two pairs of shoes. Example: • At Manuel's party, each guest can choose a meal, a drink, and a cupcake. There are two choices for a meal – hamburger or spaghetti; three choices for a drink – milk, tea, or soda; and three choices for a cupcake -- chocolate, lemon, or vanilla. Draw a tree diagram to show all possible selections for the guests. 

The bulleted items within a performance objective indicate the specific content to be taught.

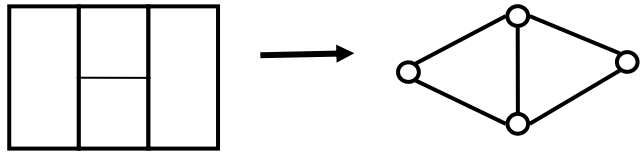
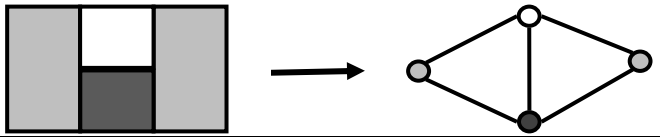
Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
		Continued on next page Sample conclusions: o There are 18 different dinner choices that include a meal, a drink, and a cupcake. o Nine dinner choices are possible for the guest that wants spaghetti for her meal. o A guest cannot choose a meal, no drink, and two cupcakes.
PO 2. Justify that all possibilities have been enumerated without duplication. Lesson 4 (make an organized list to solve a problem) Lesson 60 (making, drawing, labeling, and writing number sentences for arrays) Lesson 107 (identifying the factors of a number)	M04-S5C2-07. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question. Connections: M04-S2C3-01	Students use an organized strategy to name possibilities when checking for duplication. Example: • Students may represent all possible ways using a list or chart or array as in M03-S2C3-01 or a tree diagram as in M04-S2C3-01. Students will develop organizational strategies to replace an initial random way of thinking about all possible arrangements. They justify, "all possible arrangements" by listing all possible ways, by making the connection to the multiplication principle if the count is a large number, by explaining the organization behind their systematic list, and by enumerating all possibilities without duplication.

Correlation of Saxon *Math-4* (2e) to the 2008 Arizona Grade 4 Mathematics Standard

Strand 2: Data Analysis, Probability, and Discrete Mathematics
Concept 4: Vertex-Edge Graphs

Understand and apply vertex-edge graphs.

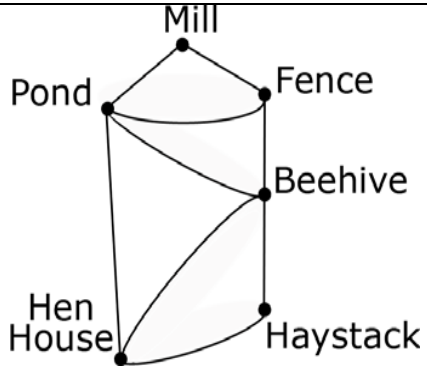
In Grade 4, students build on their understanding of vertex-edge graphs from second and third grade by demonstrating the connection between coloring maps and coloring vertices. They apply their new understanding to real world problems involving conflict.

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 1. Demonstrate the connection between map coloring and vertex coloring. *Not addressed in Saxon Math-4.* *For additional information, we recommend you go to the origin of Arizona's discrete math standard at http://dimacs.rutgers.edu/lp/institutes/dm.html*	Connections: M04-S2C4-03	In Grade 4, students learn that they can color vertex-edge graphs as they colored pictures and maps in second and third grade. The coloring of a map involves assigning different colors to regions that border each other.The coloring of a graph involves assigning colors to the vertices so that adjacent (neighboring) vertices are assigned different colors. In both cases the goal is the same, to minimize the number of colors used. Students learned in second grade how to create an associated graph from a picture or map.  In grade 4, they build on that understanding and discover if a map is colored in three colors, then its associated graph is also colored using three colors. 

The bulleted items within a performance objective indicate the specific content to be taught.

Correlation of Saxon *Math-4* (2e)
to the 2008 Arizona Grade 4 Mathematics Standard

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 2. Construct vertex-edge graphs to represent concrete situations and identify paths and circuits. *Not addressed in Saxon Math-4.* *For additional information, we recommend you go to the origin of Arizona's discrete math standard at http://dimacs.rutgers.edu/lp/institutes/dm.html*	Connections: M04-S2C4-03, SS04-S4C1-03	Students build and/or draw vertex-edge graphs based on real-world situations. Children's literature offers opportunities to connect with meaningful contexts. Example: • The graph below shows all the locations in the barnyard. The farmer is worried about his hen, Rosie, because he noticed fox tracks in the field. The farmer needs to find her quickly. Rosie is a creature of habit and always follows the same route around the barnyard. It is very important that the farmer travels each edge exactly once in his search. Find the path the farmer should take. Where does the farmer begin and end his search? Are there other paths the farmer can travel and still visit each edge only one time? If so, name those paths. NOTE: A path in a graph is a connected sequence of edges that starts at a vertex and ends at a vertex. If the path starts and ends at the same vertex, then a circuit is created. In this case, the farmer only wants to travel each edge once.

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
		
PO 3. Solve conflict problems by constructing and coloring vertex-edge graphs. *Not addressed in Saxon Math-4.* *For additional information, we recommend you go to the origin of Arizona's discrete math standard at http://dimacs.rutgers.edu/lp/institutes/dm.html*	Connections: M04-S1C3-02, M04-S2C4-01, M04-S2C4-02	Vertex-edge graphs can be used to represent problems dealing with conflict. These problems are similar to the map coloring problems introduced in second and third grade in that different colors are assigned to things that are "in conflict" or need to be separated. For instance, scheduling times for students to work on projects may be a challenge when students want to work on multiple projects. The goal is to schedule the fewest number of days for students to work on these projects. Projects are in conflict when they share the same students. The things that are in conflict (in this case, the projects) become the vertices and they are connected by an edge because they share common students. An edge represents

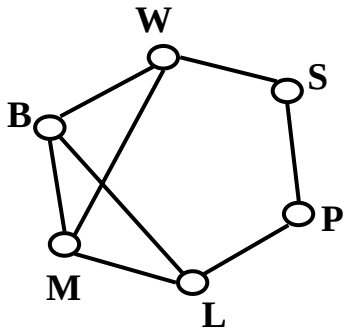
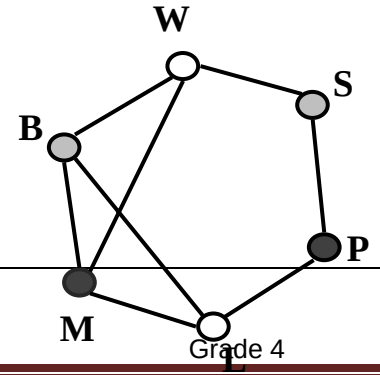
The bulleted items within a performance objective indicate the specific content to be taught.

<table>
<tr><th>Performance Objectives</th><th>Process Integration & Connections</th><th>Explanations and Examples</th></tr>
<tr><td>Students are expected to:</td><td></td><td></td></tr>
<tr><td></td><td></td><td>the students the projects share. The idea of connecting things that are in conflict may be counterintuitive. The key understanding is that the conflict is really resolved by connecting the two things in conflict, because the connected vertices are assigned different colors or different days in the case of the scheduling problem.

Example:
• Eight students in the class are researching six different Arizona bats, but they are having a hard time arranging for times to meet together. Each meeting will require a full class period at the end of the day. The teacher wants to use as few class periods as necessary. What might the schedule look like? How many days will be required for these meetings?

Continued on next page
<table><tr><th>Bat Project</th><th>Students</th><th>Day Assigned</th></tr><tr><td>Western Red Bat</td><td>Sam, Barbie, Randy</td><td></td></tr><tr><td>Spotted bat</td><td>Sam, Rob</td><td></td></tr><tr><td>Pallid bat</td><td>Rob, Mary</td><td></td></tr><tr><td>Little Brown Bat</td><td>Mary, Bob, Christie</td><td></td></tr><tr><td>Mexican Free-tailed Bat</td><td>Barbie, Bob, Jenn</td><td></td></tr><tr><td>Big Brown Bat</td><td>Randy, Christie, Jenn</td><td></td></tr></table>
Solution:

Each of the six bat projects is a vertex labeled with the first</td></tr>
</table>

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
		letter of the bat name. When a student is working on more than one project then the two projects are "in conflict" and are connected by an edge. For instance, Sam is studying the Western Red Bat and the Spotted Bat so vertices W and S are connected by an edge. Below is a vertex-edge graph that represents the scheduling problem. Depending on how the vertices are initially placed, graphs may not look identical to the one below.  Continued on next page In order to determine the minimum number of days required to schedule the six bat projects, the vertices of the graph are colored so that vertices that are adjacent (connected) to each other are assigned different colors. The minimum number of colors required is three, so three days are needed to schedule the projects. 

The bulleted items within a performance objective indicate the specific content to be taught.

Correlation of Saxon *Math-4* (2e)
to the 2008 Arizona Grade 4 Mathematics Standard

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		

The bulleted items within a performance objective indicate the specific content to be taught.

Correlation of Saxon *Math-4* (2e)
to the 2008 Arizona Grade 4 Mathematics Standard

Strand 3: Patterns, Algebra, and Functions
Patterns occur everywhere in nature. Algebraic methods are used to explore, model and describe patterns, relationships, and functions involving numbers, shapes, iteration, recursion, and graphs within a variety of real-world problem solving situations. Iteration and recursion are used to model sequential, step-by-step change. Algebra emphasizes relationships among quantities, including functions, ways of representing mathematical relationships, and the analysis of change.

Concept 1: Patterns

Identify patterns and apply pattern recognition to reason mathematically while integrating content from each of the other strands.

In Grade 4, students identify, describe, and extend numeric patterns involving all operations. They develop an understanding of the use of a rule to describe a sequence of numbers.

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 1. Recognize, describe, create, extend, and find missing terms in a numerical sequence involving whole numbers using all four basic operations. Lesson 9 (identifying missing numbers in a sequence) Lesson 29 (identifying and writing multiples) Lesson 105 (writing a function rule)	M04-S5C2-06. Summarize mathematical information, explain reasoning, and draw conclusions. Connections: M04-S3C1-02	When describing and extending a sequence or determining missing terms, students investigate the terms in order to identify a pattern of change. Students may need to build the sequence with manipulatives or draw it. Examples: • 3, 9, 27, 81, … • 64, 32, ____, 8, 4, … • 2, 5, 11, 23, … • 2, 2, 4, 6, ____, 16, …
PO 2. Explain the rule for a given numerical sequence, verify that the rule works, and use the rule to make predictions. Lesson 9 (identifying missing numbers in a sequence) Lesson 105 (writing a function rule) Lesson 132 (writing and using a function rule)	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection. M04-S5C2-06. Summarize mathematical information, explain reasoning, and draw conclusions.	Students focus on the changes in the sequence from term to term. This work lays the foundation for finding and expressing relationships which will develop into students' understanding of functions in later grades. Examples: • 2, 5, 11, 23, … Double the previous number and add 1 • 2, 2, 4, 6, ____, 16, … Add

The bulleted items within a performance objective indicate the specific content to be taught.

	Connections: M04-S1C3-02, M04-S3C1-01, M04-S3C3-01, M04-S3C4-01	the previous two numbers

Strand 3: Patterns, Algebra, and Functions
Concept 2: Functions and Relationships

Describe and model functions and their relationships.

In Grade 4, there are no performance objectives in this concept.

Strand 3: Patterns, Algebra, and Functions
Concept 3: Algebraic Representations

Represent and analyze mathematical situations and structures using algebraic representations.

In Grade 4, students use symbols to represent unknown quantities in expressions and equations as well as solve one-step equations with whole numbers.

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 1. Use a symbol to represent an unknown quantity in a simple algebraic expression involving all operations. Lesson 23 (draw pictures & write number sentences for equal group stories) Lesson 55 (identify missing addends to 100, make change from $1.00) Lesson 63 (identify missing addends to 1000, make change from $10.00) Lesson 105 (writing a function rule)	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. Connections: M04-S3C1-02, M04-S3C3-02	Connecting writing expressions with story problems and/or drawing pictures will give students a context for this work. It is important for students to read algebraic expressions in a manner that reinforces that the variable represents a number. Examples: • r + 21 as "some number plus 21" as well as "r plus 21" • n x 6 as "some number times 6" as well as "n times 6" • $\frac{s}{6}$ and s ÷ 6 as "as some number divided by 6" as well as

The bulleted items within a performance objective indicate the specific content to be taught.

Correlation of Saxon *Math-4* (2e)
to the 2008 Arizona Grade 4 Mathematics Standard

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
		"s divided by 6" • Bill earned $5.00 mowing the lawn on Saturday. He earned more money on Sunday. Write an expression that shows the amount of money Bill has earned. Solution: $5.00 + *n*
PO 2. Create and solve one-step equations that can be solved using addition, subtraction, multiplication, and division of whole numbers. Lesson 9 (identifying a missing addend) Lesson 23 (drawing pictures & writing number sentences for equal group stories) Lesson 45 (identifying and writing number sentences for Some, Some more and Some, Some went away stories and writing story problems for add., sub., & mult. number sent.) Lesson 55 (identifying missing addends to 100) Lesson 60 (making, drawing, labeling, and writing number sentences for arrays) Lesson 61 (finding the missing dimension of an array) Lesson 63 (identifying missing addends to 1000) Lesson 134 (writing and using perimeter formulas)	M04-S5C2-01. Analyze a problem situation to determine the question(s) to be answered. M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. Connections: M04-S1C2-02, M04-S1C2-04, M04-S1C3-02, M04-S3C3-01	Students create and solve equations that are based on real world situations. It may be beneficial for students to draw pictures that illustrate the equation in problem situations. Beginning experiences in solving equations should require students to understand the meaning of the equation as well as the question being asked. Solving equations using reasoning and prior knowledge should be required of students to allow them to develop effective strategies. Example: • Joey had 26 papers in his desk. His teacher gave him some more and now he has 100. How many papers did his teacher give him? 26 + n = 100 Some number was added to 26 and the result was 100. What number was added to 26 to get 100? o Reasoning: 26 + 70 is 96. 96 + 4 is 100, so the number added to 26 to get 100 is 74. o Use knowledge of fact families to write related equations: n + 26 = 100, 100-n = 26, 100 – 26 = n. Select the equation that helps you find n easily. o Use knowledge of inverse operations: Since subtraction "undoes" addition then subtract 26 from 100 to get the numerical value of n.

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Correlation of Saxon *Math-4* (2e) to the 2008 Arizona Grade 4 Mathematics Standard

Strand 3: Patterns, Algebra, and Functions
Concept 4: Analysis of Change

Analyze how changing the values of one quantity corresponds to change in the values of another quantity.

In Grade 4, students make predictions based on changes in data over time.

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 1. Identify the change in a quantity over time and make simple predictions. Lesson 104 (using a line graph) Lesson 105 (writing a function rule) Lesson 133 (graphing linear functions on a coordinate plane)	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. Connections: M04-S1C3-02, M04-S2C1-02, M04-S3-C1-02, SS04-S5C5-01	Students' understanding of how the change in one quantity co-varies with the change in a second quantity builds the foundation for functions in later grades. Example: • The chart below shows the height of a bean plant over a four week period. o Identify the change in the height of the plant. (As the number of weeks increased by one, the height of the plant increased by $2\frac{1}{2}$ inches.) o Predict what the height of the bean plant might be in week 5.

Week	1	2	3	4
Height of Plant (in inches)	1	$3\frac{1}{2}$	6	$8\frac{1}{2}$

The bulleted items within a performance objective indicate the specific content to be taught.

Strand 4: Geometry and Measurement

Geometry is a natural place for the development of students' reasoning, higher thinking, and justification skills culminating in work with proofs. Geometric modeling and spatial reasoning offer ways to interpret and describe physical environments and can be important tools in problem solving. Students use geometric methods, properties and relationships, transformations, and coordinate geometry as a means to recognize, draw, describe, connect, analyze, and measure shapes and representations in the physical world. Measurement is the assignment of a numerical value to an attribute of an object, such as the length of a pencil. At more sophisticated levels, measurement involves assigning a number to a characteristic of a situation, as is done by the consumer price index. A major emphasis in this strand is becoming familiar with the units and processes that are used in measuring attributes.

Concept 1: Geometric Properties

Analyze the attributes and properties of 2- and 3- dimensional figures and develop mathematical arguments about their relationships.

In Grade 4, students deepen their understanding of 2-dimensional figures by classifying triangles and other two-dimensional polygons using properties and attributes. Students also recognize nets for 3-dimensional figures.

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 1. Draw and describe the relationships between points, lines, line segments, rays, and angles including parallelism and perpendicularity. Lesson 14 (naming line segments) Lesson 15 (line segments, identify horizontal, vertical, oblique) Lesson 64 (naming shapes, angles, and diagonals) Lesson 65 (parallel and perpendicular lines and segments) Lesson 108 (identifying the rays and vertex of an angle, identify right and straight angles) Lesson 111 (identify acute and obtuse angles)	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. Connections: M04-S4C1-02, M04-S4C1-03, M04-S4C1-06	Examples of points, line segments, angles, parallelism, and perpendicularity can be seen daily. Students do not easily identify lines and rays because they are more abstract. Students can arrange two pencils in as many different ways as possible to determine that the 2 pencils might intersect in one point or may never intersect. Further investigations could lead to pencils that are parallel, perpendicular or intersecting in some other way. This can lead to a discussion on points, angles, lines and rays. Students should become familiar with parallelism and perpendicularity. Parallelism is described as lines in the same plane that never intersect and are always equidistant. Perpendicularity is described as two lines in the same plane that intersect to form right (90^{o}) angles. Continued on next page

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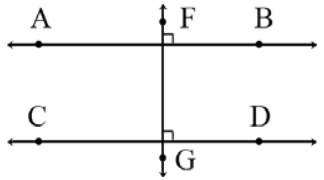
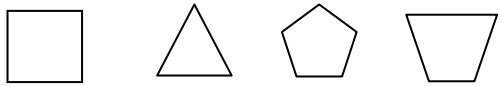
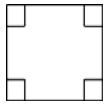
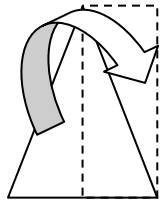
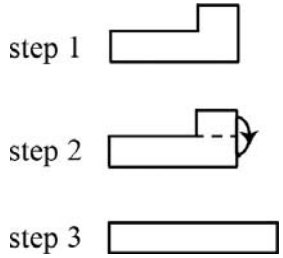
Correlation of Saxon *Math-4* (2e) to the 2008 Arizona Grade 4 Mathematics Standard

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
		Parallel and perpendicular lines are shown below: 
PO 2. Justify which objects in a collection match a given geometric description. Lesson 64 (naming shapes, angles, and diagonals) Lesson 65 (identifying parallel and perpendicular lines and line segments) Lesson 71 (identifying triangles, squares, and parallelograms) Lesson 81 (identifying, naming, and drawing quadrilaterals) Lesson 85 (identifying, naming, and drawing polygons) Lesson 86 (naming and drawing quadrilaterals)	M04-S5C2-06. Summarize mathematical information, explain reasoning, and draw conclusions. M04-S5C2-07. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question. Connections: M04-S4C1-01, M04-S4C1-03, M04-S4C1-05, M04-S4C1-06, M04-S4C1-07, M04-S4C3-03	Example: • Identify which of these shapes have perpendicular or parallel sides and justify your selection.  A possible justification that students might give is: The square has perpendicular lines because the sides meet at a corner, forming right angles. 
PO 3. Describe and classify triangles by angles and sides. Lesson 124 (identifying right, obtuse, acute triangles) Lesson 131 (equilateral, isosceles, and scalene triangles)	M04-S5C2-07. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question. Connections: M04-S4C1-01, M04-S4C1-02, M04-S4C1-06	A triangle can be described in more than one way. Examples: • A right triangle can be both scalene and isosceles. • A scalene triangle can be right, acute and obtuse.

The bulleted items within a performance objective indicate the specific content to be taught.

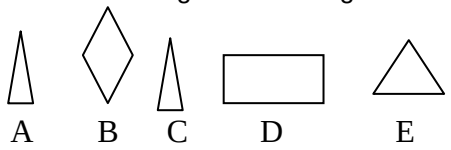
Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
		Continued on next page Triangles can be classified by: • Angles o Right: The triangle has one angle that measures 90º. o Acute: The triangle has exactly three angles that measure between 0º and 90º. o Obtuse: The triangle has exactly one angle that measures greater than 90º and less than 180º. • Sides o Equilateral: All sides of the triangle are the same length. o Isosceles: At least two sides of the triangle are the same length. o Scalene: No sides of the triangle are the same length.

Correlation of Saxon *Math-4* (2e) to the 2008 Arizona Grade 4 Mathematics Standard

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 4. Recognize which attributes (such as shape or area) change and which do not change when 2-dimensional figures are cut up or rearranged. Lesson 47 (drawing a reflection over a line of symmetry) Lesson 57 (area of an irregular shape using a grid) Lesson 82 (building polygons using tangram pieces) Lesson 89 (identifying and drawing translations, rotations, reflections)	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. M04-S5C2-07. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question. Connections: M04-S4C4-04	Examples: •Students should recognize that the area of the triangle and the area of the rectangle are equal.  •Students should recognize that when the shape is rearranged, the number of sides and vertices change, but the area remains the same. 

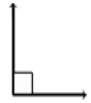
The bulleted items within a performance objective indicate the specific content to be taught.

Correlation of Saxon *Math-4* (2e) to the 2008 Arizona Grade 4 Mathematics Standard

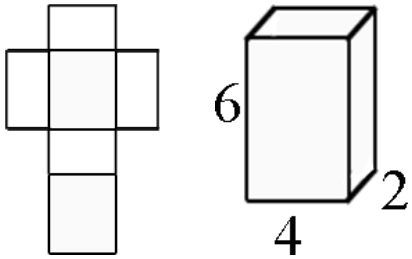
Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 5. Recognize and draw congruent figures, and match them in a given collection. Lesson 71 (identifying congruent shapes)	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. Connections: M04-S4C1-02, M04-S4C1-07	Figures are congruent if they have the same shape and are the same size. Example: • Which of these figures are congruent?  Solution: Figure A ≅ Figure C

The bulleted items within a performance objective indicate the specific content to be taught.

Correlation of Saxon *Math-4* (2e)
to the 2008 Arizona Grade 4 Mathematics Standard

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 6. Draw right, acute, obtuse, and straight angles and identify these angles in other geometric figures. Lesson 108 (identify rays & vertex of an angle; right & straight angles) Lesson 111 (identify acute & obtuse angles; use a protractor) Lesson 121 (drawing angles using a protractor) Lesson 124 (identifying right, obtuse, and acute triangles) Lesson 135 (identifying supplementary angles)	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. Connections: M04-S4C1-01, M04-S4C1-02, M04-S4C1-03	Students use the benchmark angles of 90°, 180°, and 360° to approximate the measurement of angles to draw or identify right, acute, obtuse, and straight angles. Example: Right angle  Acute angle  Obtuse angle  Straight angle 

The bulleted items within a performance objective indicate the specific content to be taught.

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 7. Recognize the relationship between a 3-dimensional figure and its corresponding net(s). Lesson 113 (identify and make models of geometric solids) Lesson 114 (identify faces, edges, vertices; sketch solids)	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. M04-S5C2-06. Summarize mathematical information, explain reasoning, and draw conclusions. Connections: M04-S4C1-02, M04-S4C1-05	Students will recognize the relationship between a figure and its net by: • making a net(s) for a basic 3-dimensional figure, • identifying the 3-dimensional figure that corresponds to a given net, and • identifying the net that corresponds to a given 3-dimensional figure. 

Strand 4: Geometry and Measurement
Concept 2: Transformation of Shapes

Apply spatial reasoning to create transformations and use symmetry to analyze mathematical situations.

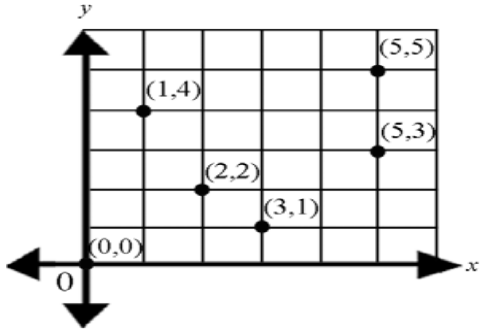
In Grade 4, there are no performance objectives in this concept.

Correlation of Saxon *Math-4* (2e) to the 2008 Arizona Grade 4 Mathematics Standard

Strand 4: Geometry and Measurement
Concept 3: Coordinate Geometry

Specify and describe spatial relationships using rectangular and other coordinate systems while integrating content from each of the other strands.

In Grade 4, students use coordinates to describe positions in the first quadrant on a grid. They plot line segments and connect the segments to construct geometric figures.

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 1. Name, locate, and graph points in the first quadrant of the coordinate plane using ordered pairs. Lesson 50 (using coordinates to find a location on a map) Lesson 110 (identify the coordinates of a point on a coordinate plane)	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. Connections: M04-S4C3-02, M04- S4C3-03	Example: • Students can use a classroom size coordinate grid to physically locate the coordinate point (5, 3) by starting at the origin point (0,0), walking 5 units along the x axis to find the first number in the pair (5), and then walking up 3 units for the second number in the pair (3). The ordered pair names a point on the grid. 
PO 2. Plot line segments in the first quadrant of the coordinate plane using a set of ordered pairs in a table. Lesson 133 (graphing linear functions on a coordinate plane)	M04-S5C2-02. Identify relevant, missing, and extraneous information related to the solution to a problem. M04-S5C2-05. Represent a problem situation using any	As students plot line segments in the first quadrant of the coordinate plane, they build on the skills learned in M04-S4C3-01.

The bulleted items within a performance objective indicate the specific content to be taught.

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
	combination of words, numbers, pictures, physical objects, or symbols. Connections: M04-S2C1-01, M04-S4C3-01, M04-S4C3-03	
PO 3. Construct geometric figures with vertices at points on the coordinate plane. Lesson 110 (graphing ordered pairs on a coordinate plane)	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. Connections: M04-S4C1-02, M04-S4C3-01, M04-S4C3-02	As students construct geometric figures on the coordinate plane, they practice the skills used in previous performance objectives (M04-S4C3-01, M04-S4C3-02). Students investigate the relationship of coordinates of squares, rectangles and isosceles triangles to further enhance their understanding of coordinates and properties of these shapes.

Strand 4: Geometry and Measurement
Concept 4: Measurement

Understand and apply appropriate units of measure, measurement techniques, and formulas to determine measurements.

In Grade 4, students expand their understanding of measuring in standard units of measure from U.S. Customary to metric. They build on concepts of time by computing elapsed time. They explore and develop an understanding of the relationship between area and perimeter of plane figures.

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 1. Compute elapsed time to the minute. Lesson 7 (read, write, estimate time; relationships between units of time) Lesson 34 (reading time as minutes before an hour)	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection.	Students may estimate and determine elapsed time using a calendar, a digital clock, or an analog clock. Students should have numerous experiences using the terminology for time (including, but not limited to, hour, half-hour, quarter of an hour, quarter past the hour, quarter until the hour, etc.).

The bulleted items within a performance objective indicate the specific content to be taught.

Correlation of Saxon *Math-4* (2e) to the 2008 Arizona Grade 4 Mathematics Standard

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
Lesson 44 (finding elapsed time) Math Meeting—daily	M04-S5C2-05. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. Connections: M04-S1C3-02	Example: • The game begins at 11:30 a.m. If the game lasts 2 hours and 15 minutes, what time will it end?
PO 2. Apply measurement skills to measure length, mass, and capacity using metric units. Lesson 14 (measuring line segments using centimeters and millimeters) Lesson 15 (drawing line segments using centimeters and millimeters) Lesson 39 (identifying equivalent linear units of measurement) Lesson 57 (finding the area of an irregular shape using a grid) Lesson 69 (measure & draw segments to fourths of an inch) Lesson 71 (identify units of mass) Lesson 72 (estimating and finding the mass of an object) Lesson 74 (reading a thermometer in Fahrenheit and Celsius) Lesson 75 (reading temperatures below zero) Lesson 88 (measuring to a tenth of a centimeter) Lesson 92 (identify the liquid capacity of common containers) Lesson 126 (measure & draw segments to eighths of an inch)	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection Connections: M04-S1C1-01, M04-S1C3-01, M04-S1C3-02, M04-S4C4-03, M04-S4C4-04, SC04-S1C2-04	Measurement skills include: • determining situations in which a highly accurate measurement is important, • selecting the appropriate unit of measure and degree of accuracy, • selecting the appropriate tool, and • estimating, measuring, and comparing estimates to actual measures.

The bulleted items within a performance objective indicate the specific content to be taught.

Correlation of Saxon *Math-4* (2e) to the 2008 Arizona Grade 4 Mathematics Standard

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 3. Solve problems involving conversions within the same measurement system. Lesson 22 (feet to inches, cm to mm) Lesson 39 (identifying equivalent linear units of measurement) Lesson 43 (measuring distance using a scale) Lesson 56 (identifying the number of square inches in one square foot) Lesson 72 (identifying units of mass) Lesson 74 (reading a thermometer using the Fahrenheit and Celsius scales/ estimate temperature) Lesson 75 (reading temperatures below zero on a thermometer/ locate negative numbers on a thermometer) Lesson 92 (identifying cups, pints, quarts, gallons)	M04-S5C2-01. Analyze a problem situation to determine the question(s) to be answered. M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection. M04-S5C2-07. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question. Connections: M04-S1C3-02, M04-S4C4-02	Students have been exposed to both the U.S customary and metric measurement systems. Examples: • Jill bought 3 meters of ribbon and cut it into pieces 25 centimeters long. How many 25 centimeter pieces of ribbon did she have? • How many quarts of lemonade are needed to make 40 one-cup servings?

The bulleted items within a performance objective indicate the specific content to be taught.

Correlation of Saxon *Math-4* (2e) to the 2008 Arizona Grade 4 Mathematics Standard

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 4. Solve problems involving perimeter of 2-dimensional figures and area of rectangles. Lesson 56 (find square inches or square feet in a shape) Lesson 57 (finding the area of an irregular shape using a grid) Lesson 60 & 61 (arrays as equal areas) Lesson 82 (finding the area of polygons using tangram pieces) Lesson 103 (finding perimeter) Lesson 132 (measuring circumference) Lesson 134 (writing and using perimeter formulas)	M04-S5C2-01. Analyze a problem situation to determine the question(s) to be answered. M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection. M04-S5C2-07. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question. Connections: M04-S1C3-02, M04-S4C1-04, M04-S4C4-02, M04-S4C4-05	Students contrast the concepts and relationships of area and perimeter including the units used to measure both. It is important for students to recognize that units used to measure area are 2-dimensional and cover a space. In order to distinguish between perimeter and area students may need to physically fill a rectangle with 1-inch color tiles or squares and use a string to measure around the rectangle to understand that area is a measure of the space within a specific region and perimeter is measuring the distance around a region. Squares can be cut from cardboard or construction paper. Square grid paper can also be used to measure area. Students don't usually connect to the formula *l* x *w* by filling a region with 1 unit squares. That realization occurs when students make the connection between multiplication and the rectangular array model. Example: • What is the area of the shape below? 2 in.  5 in. Using a grid will allow students to see the 5 square inches 2 times or the 2 square inches 5 times.
PO 5. Describe the change in perimeter or area when one attribute (length or width) of a rectangle changes. Lesson 56 (find square inches or square feet in a shape) Lesson 57 (finding the area of an irregular shape using a grid) Lesson 60 & 61 (arrays as area) Lesson 82 (finding the area of polygons using tangram pieces) Lesson 103 (finding perimeter) Lesson 134 (writing and using perimeter formulas)	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection. M04-S5C2-06. Summarize mathematical information, explain reasoning, and draw conclusions.	As students explore problems (M04-S4C4-04), they begin to notice similarities and differences in area and perimeter. They describe the relationship between the two ideas. Example: • Draw different rectangles, each with an area of 24 square units, and compare their perimeters. What patterns do you notice in the data? This data can be recorded in a table and graph.

The bulleted items within a performance objective indicate the specific content to be taught.

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
	Connections: M04-S1C3-02, M04-S4C4-04	

Strand 5: Structure and Logic

This strand emphasizes the core processes of problem solving. Students draw from the content of the other four strands to devise algorithms and analyze algorithmic thinking. Strand One and Strand Three provide the conceptual and computational basis for these algorithms. Logical reasoning and proof draws its substance from the study of geometry, patterns, and analysis to connect remaining strands. Students use algorithms, algorithmic thinking, and logical reasoning (both inductive and deductive) as they make conjectures and test the validity of arguments and proofs. Concept two develops the core processes as students evaluate situations, select problem solving strategies, draw logical conclusions, develop and describe solutions, and recognize their applications.

Concept 1: Algorithms and Algorithmic Thinking

Use reasoning to solve mathematical problems.

In Grade 4, students use symbols, pictures, or mathematical language to explain the reasoning behind their decisions and solutions.

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:		
PO 1. Analyze common algorithms for computing (adding, subtracting, multiplying, and dividing) with whole numbers using the associative, commutative, and distributive properties. Lesson 5 (identifying the commutative property of addition) Lesson 6 (adding multiples of 10, 100, 1,000, and 10,000 using mental computation / adding multiples of 10 to a 2-digit number using mental computation) Lesson 11 (adding 2-digit numbers using mental computation) Lesson 16 (adding 3, 2-digit numbers and 2 3-digit numbers using mental computation)	M04-S5C2-03. Select and use one or more strategies to efficiently solve the problem and justify the selection. Connections: M04-S1C2-01, M04-S1C2-02, M04-S1C2-04, M04-S1C2-05, M04-S1C2-06, M04-S1C3-02	Students apply the commutative, associative, and distributive properties, as well as concepts of place value when solving problems. These properties focus on equivalency at this grade level. Examples: • Commutative Property: 30 + 9 = 9 + 30 • Associative Property: (84 + 7) + 5 = 84 + (7 + 5) • Distributive Property: 8 x 23 = (8 x 20) + (8 x 3)

The bulleted items within a performance objective indicate the specific content to be taught.

Lesson 26 (identifying the commutative property of multiplication) Lesson 38 (multiply a 2-digit number by a one-digit number using mental computation, multiply three single-digit numbers) Lesson 49 (multiply a 2-digit number by a one-digit number using the multiplication algorithm) Lesson 58 (subtract a 2-digit numbers using mental computation) Lesson 73 (multiply a 2-digit number by a 2-digit number)		

Strand 5: Structure and Logic
Concept 2: Logic, Reasoning, Problem Solving, and Proof

Evaluate situations, select problem-solving strategies, draw logical conclusions, develop and describe solutions, and recognize their applications.

In Grade 4, students become more adept at conjecturing and collecting evidence to make generalizations.

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:	Some of the Strand 5 Concept 2 performance objectives are listed throughout the grade level document in the Process Integration Column (2nd column). Since these performance objectives are connected to the other content strands, the process integration column is not used in this section next to those performance objectives.	
PO 1. Analyze a problem situation to determine the question(s) to be answered. Lesson 23 (drawing pictures & writing number sentences for equal group stories) Lesson 31 (writing "equal group" story problems) Lesson 45 (identifying and writing number sentences for "some, some more" and "some, some went away" stories) Lesson 59 (identifying and solving "larger, smaller, difference" stories) Lesson 67 (recording transactions in a checkbook) Lesson 70 (story problems involving division) Lesson 83 (writing remainders for division story problems) Lesson 106 (finding a fractional part of a set) Lesson 120 (finding the percent of a number)		

The bulleted items within a performance objective indicate the specific content to be taught.

Correlation of Saxon *Math-4* (2e) to the 2008 Arizona Grade 4 Mathematics Standard

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:	Some of the Strand 5 Concept 2 performance objectives are listed throughout the grade level document in the Process Integration Column (2nd column). Since these performance objectives are connected to the other content strands, the process integration column is not used in this section next to those performance objectives.	
PO 2. Identify relevant, missing, and extraneous information related to the solution to a problem. Lesson 23 (drawing pictures & writing number sentences for equal group stories) Lesson 31 (writing "equal group" story problems) Lesson 45 (identifying and writing number sentences for "some, some more" and "some, some went away" stories) Lesson 59 (identifying and solving "larger, smaller, difference" stories) Lesson 67 (recording transactions in a checkbook) Lesson 70 (story problems involving division) Lesson 83 (writing remainders for division story problems) Lesson 106 (finding a fractional part of a set) Lesson 120 (finding the percent of a number)		Identifying what is important in a problem should become common practice as students analyze situations. These skills build on the ideas in M04-S5C2-01.
PO 3. Select and use one or more strategies to efficiently solve the problem and justify the selection. Lesson 23 (drawing pictures & writing number sentences for equal group stories) Lesson 31 (writing "equal group" story problems) Lesson 45 (identifying and writing number sentences for "some, some more" and "some, some went away" stories)		

The bulleted items within a performance objective indicate the specific content to be taught.

Correlation of Saxon *Math-4* (2e)
to the 2008 Arizona Grade 4 Mathematics Standard

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:	Some of the Strand 5 Concept 2 performance objectives are listed throughout the grade level document in the Process Integration Column (2nd column). Since these performance objectives are connected to the other content strands, the process integration column is not used in this section next to those performance objectives.	
Lesson 59 (identifying and solving "larger, smaller, difference" stories) Lesson 67 (recording transactions in a checkbook) Lesson 70 (story problems involving division) Lesson 83 (writing remainders for division story problems) Lesson 106 (finding a fractional part of a set) Lesson 120 (finding the percent of a number)		
PO 5. Represent a problem situation using any combination of words, numbers, pictures, physical objects, or symbols. Lesson 23 (drawing pictures and writing number sentences for equal group stories) Lesson 31 (writing equal group story problems) Lesson 45 (identifying and writing number sentences for Some, Some more and Some, Some went away stories / writing story problems for addition, subtraction, and multiplication number sentences) Lesson 59 (identify and solve Larger/Smaller difference story problems) Lesson 70 (acting out, drawing pictures, and writing number sentences to solve equal group story problems with division) Lesson 105 (writing a function rule)		

The bulleted items within a performance objective indicate the specific content to be taught.

Correlation of Saxon *Math-4* (2e)
to the 2008 Arizona Grade 4 Mathematics Standard

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:	Some of the Strand 5 Concept 2 performance objectives are listed throughout the grade level document in the Process Integration Column (2nd column). Since these performance objectives are connected to the other content strands, the process integration column is not used in this section next to those performance objectives.	
PO 6. Summarize mathematical information, explain reasoning, and draw conclusions. Lesson 23 (drawing pictures & writing number sentences for equal group stories) Lesson 31 (writing "equal group" story problems) Lesson 45 (identifying and writing number sentences for "some, some more" and "some, some went away" stories) Lesson 59 (identifying and solving "larger, smaller, difference" stories) Lesson 67 (recording transactions in a checkbook) Lesson 70 (story problems involving division) Lesson 83 (writing remainders for division story problems) Lesson 106 (finding a fractional part of a set) Lesson 120 (finding the percent of a number)		Summarizing mathematical ideas, explaining reasoning, and drawing conclusions are the foundations of making generalizations.

Correlation of Saxon *Math-4* (2e)
to the 2008 Arizona Grade 4 Mathematics Standard

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:	Some of the Strand 5 Concept 2 performance objectives are listed throughout the grade level document in the Process Integration Column (2nd column). Since these performance objectives are connected to the other content strands, the process integration column is not used in this section next to those performance objectives.	
PO 7. Analyze and evaluate whether a solution is reasonable, is mathematically correct, and answers the question. Lesson 23 (drawing pictures & writing number sentences for equal group stories) Lesson 31 (writing "equal group" story problems) Lesson 45 (identifying and writing number sentences for "some, some more" and "some, some went away" stories) Lesson 59 (identifying and solving "larger, smaller, difference" stories) Lesson 67 (recording transactions in a checkbook) Lesson 70 (story problems involving division) Lesson 83 (writing remainders for division story problems) Lesson 106 (finding a fractional part of a set) Lesson 120 (finding the percent of a number)		Checking whether an answer makes sense and answers the question should become common practices as students analyze situations.
PO 8. Make and test conjectures based on data (or information) collected from explorations and experiments. Lesson 3 (collect information from a survey) Lesson 100 (identifying the probability of an event, conducting an experiment with a spinner) Lesson 112 (making a stem-and-leaf plot)		Making and testing conjectures are essential steps leading to making generalizations.

The bulleted items within a performance objective indicate the specific content to be taught.

Performance Objectives	***Process Integration & Connections***	***Explanations and Examples***
Students are expected to:	Some of the Strand 5 Concept 2 performance objectives are listed throughout the grade level document in the Process Integration Column (2nd column). Since these performance objectives are connected to the other content strands, the process integration column is not used in this section next to those performance objectives.	
Lesson 115 (finding the probability of an event, conducting a probability experiment)		