Mathematical Processes Standard

Students use mathematical processes and knowledge to solve problems. They apply the mathematical processes as they learn content from the other mathematical standards.

Grade 1 Indicators	Grade 2 Indicators	Grade 3 Indicators
Problem Solving 1. Apply and adapt a variety of appropriate strategies to solve problems: draw a picture • create a mathematical model • draw a picture • act it out • look for a pattern • guess and check **Reasoning and Proof** 1. Use models and logic to make conclusions. 2. Adjust models as needed. 3. Reason inductively by identifying patterns. **Communication** 1. Use developmentally appropriate mathematical vocabulary. 2. Respond to instructions orally, and visually as appropriate; e.g., tell, share, describe, demonstrate, compare. 3. Respond clearly with sufficient detail so that Thinking can be understood. **Connections** 1. Use learning from one area of mathematics to understand another. 2. Relate new and prior knowledge to make sense of new concepts being learned. 3. Make connections between mathematics and everyday life. **Representation** 1. Select an appropriate representation of a mathematical idea or situation: • physical model/manipulative • picture/drawing • numerical • geometric	**Problem Solving** 1. Apply and adapt a variety of appropriate strategies to solve problems: • create a mathematical model • draw a picture • act it out • look for a pattern • guess and check • make an organized list **Reasoning and Proof** 1. Use models and logic to make conclusions. 2. Adjust models as needed. 3. Reason inductively by identifying patterns. 4. Evaluate and analyze the mathematical thinking and strategies of others orally. **Communication** 1. Use developmentally appropriate mathematical vocabulary. 2. Respond to instructions orally, visually and in writing as appropriate; e.g., tell, share, describe, demonstrate, compare, discuss, write. 3. Respond clearly with sufficient detail so that thinking can be understood. 4. Present thinking in a logical and organized in manner and explain to others how a problem was solved. **Connections** 1. Use learning from one area of mathematics to understand another. 2. Relate new and prior knowledge to make sense of new concepts being learned. 3. Make connections between mathematics and everyday life. 4. Apply a strategy or reference system that draws on previous learning in another context.	**Problem Solving** 1. Apply and adapt a variety of appropriate strategies to solve problems: • create a mathematical model • draw a picture • act it out • look for a pattern • guess and check • make an organized list • make a simpler but similar problem **Reasoning and Proof** 1. Use models and logic to make conclusions. 2. Adjust models as needed. 3. Reason inductively by identifying patterns. 4. Evaluate and analyze the mathematical thinking and strategies of others, orally and in writing. 5. Include enough detail and clarity that the reader/listener can follow the explanation. **Communication** 1. Use developmentally appropriate mathematical language and vocabulary. 2. Respond to instructions orally, visually and in writing as appropriate; e.g., tell, share, describe, demonstrate, compare, discuss, write. 3. Respond clearly with sufficient detail so that thinking can be understood. 4. Present thinking in a logical and organized in manner and explain to others how a problem was solved. 5. Read and reread all of the given information and instructions to ensure understanding; e.g., identify key information needed to solve the problem. **Connections** 1. Use learning from one area of mathematics to understand another.

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Mathematical Processes – Standard A
GRADE 2

Diocese of Toledo
Mathematics Course of Study
Adopted: 2010 (4.26.10)

Grade 1 Indicators	Grade 2 Indicators	Grade 3 Indicators

• graphical
2. Understand that more than one representation can be used to appropriately represent the same mathematical idea or situation.
 	
Reflection
1. Reflect on mathematical concepts that have been learned using drawings, pictures and/or words: e.g., as a class group discussion and activity, create a simple classroom chart to show what has been learned.
2. In a math journal reflect on mathematical concepts that have been learned using drawings, pictures and/or words given writing prompts such as:
   • What did you do in math today?
   • What did you learn in math today?
   • What are some of the math words you used today?
	Representation
	1. Select an appropriate representation of a mathematical idea or situation:
	   • physical model/manipulative
	   • picture/drawing/diagram
	   • numerical
	   • geometric
	   • graphical
	   • table/chart
	2. Understand that more than one representation can be used to appropriately represent the same mathematical idea or situation.
	3. Use multiple representations, as required; e.g., table/chart, graph.
	
	Reflection
	1. Reflect on mathematical concepts that have been learned using drawings, pictures and/or words: e.g., as a class group discussion and activity, create a simple classroom chart to show what has been learned.
	2. In a math journal reflect on mathematical concepts that have been learned using drawings, pictures and/or words given writing prompts such as:
	   • What did you do in math today?
	   • What did you learn in math today?
	   • Was what you learned easy or difficult?
	   • What did you like or dislike about today's lesson?
	   • What are some of the math words you used today?
		2. Relate new and prior knowledge to make sense of new concepts being learned.
		3. Make connections between mathematics and everyday life.
		4. Apply a strategy or reference system that draws on previous learning in another context.
		5. Make connections between different representations; e.g., numeric, graphical, and/or algebraic.
		
		Representation
		1. Select an appropriate representation of a mathematical idea or situation:
		   • physical model/manipulative
		   • picture/drawing/diagram
		   • numerical
		   • geometric
		   • graphical
		   • table/chart
		   • graphical organizers/Venn diagram
		2. Understand that more than one representation can be used to appropriately represent the same mathematical idea or situation.
		3. Use multiple representations, as required; e.g., table/chart, graph.
		
		Reflection
		1. Reflect on mathematical concepts that have been learned using drawings, pictures and/or words: e.g., as a class group discussion and activity, create a simple classroom chart to show what has been learned.
		2. In a math journal reflect on mathematical concepts that have been learned using drawings, pictures, math symbols, vocabulary, and language appropriate to the topic. Use writing prompts such as:
		   • What did you do in math today?
		   • What did you learn in math today?
		   • Was what you learned easy or difficult?
		   • What did you like or dislike about today's lesson?
		   • What are some of the math words you used today?

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Mathematical Processes – Standard A
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Grade 1 Indicators	Grade 2 Indicators	Grade 3 Indicators
		• Describe uses for what you learned in math today.

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Mathematical Processes – Standard A
GRADE 2

Diocese of Toledo
Mathematics Course of Study
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Numbers, Number Sense and Operations Standard

Students demonstrate number sense, including an understanding of number systems and operations and how they relate to one another. Students compute fluently and make reasonable estimates using paper and pencil, technology-supported and mental methods.

Grade 1 Indicators	Grade 2 Indicators	Grade 3 Indicators
1. Represent whole numbers 0-100 and describe their place value using physical models, numerals, words, and expanded notation.	1. Represent whole numbers 100-1,000 and describe their place value using physical models, numerals, words, and expanded notation.	1. Represent whole numbers to hundred thousands place using physical models, numerals, words, and expanded notation.
2. Count forward and backward from 0 - 100, and count forward or backward starting at any number between 1 and 100. (Write numbers that come before, after or in between two given numbers)	2. Compare and order numerals to 100 to 1,000, using mathematical language and symbols: greater than, less than, equal to, >, <, =.	2. Compare and order numbers 1,000 to 1,000,000, using mathematical language and symbols: greater than, less than, equal to, >, <, =.
3. Read and write numerals 0 – 100.	3. Recognize and classify numbers as even or odd: (0-100).	3. Round 2, 3, and 4-digit numbers to the nearest 10, 100, or 1,000.
4. Compare and order numerals 0 -100, using mathematical language: greater than, less than, equal to.	4. Identify patterns on a 100's chart and orally skip count by 10's, 5's and 2's starting from any single digit number: e.g. 1, 11, 21, 31…, 5, 15, 25, 35… 1, 6, 11, 16 …, 2, 7, 12, 17…	4. Add and subtract 3-digit whole numbers with and without regrouping.
5. Identify patterns on a 100's chart and orally skip count by 10's, 5's and 2's, starting from 0 up to 100.	5. Round 2-digit and 3-digit numbers to the nearest 10 and 100.	5. Estimate the results of whole number addition and subtraction problems using rounding, and front end estimation, and judge the reasonableness.
6. Use ordinal numbers to identify and order objects up to 30 items.	6. Model, represent and explain addition and subtraction using manipulatives, a number line, drawing pictures and a calculator.	6. Model, represent and explain the meaning of multiplication; e.g., repeated addition, skip counting, rectangular arrays.
7. Recognize and classify numbers as even or odd by determining if a set of objects can be shared equally between two people (0 - 20).	7. Use strategies for learning the basic addition and subtraction facts for sums to 18; e.g., counting on or counting backwards, one more or one less, two more or two less, doubles, doubles plus or minus 1, making 10, adding zero, missing addends.	7. Model, represent and explain the meaning of division; e.g., repeated subtraction, separating a large group of items into smaller equal groups.
8. Model, represent and explain addition as counting on and combining sets using manipulatives, a number line, drawing pictures and a calculator.	8. Demonstrate fluency with addition and subtraction facts, sums to 18.	8. Develop multiplication and division facts to the 12's.
9. Use strategies for learning the basic addition facts for sums to 12; e.g., counting on, adding one more, adding two more, doubles, doubles plus or minus 1, making 10, adding zero, and missing addends.	9. Add and subtract 2-digit numbers with and without regrouping.	9. Explain and use relationships between operations such as addition and subtraction are inverse operations, and multiplication and division are inverse operations; e.g., fact families.
10. Model and use the commutative property for addition using manipulatives.	10. Model and use the commutative property of addition using number sentences.	10. Mentally compute with multiples of 10; e.g., 30 x 5, 40 x 60, 200 x 9
11. Model, represent and explain subtraction as comparison and take-away using manipulatives, a number line, drawing pictures and a calculator.		11. Multiply 2-digit numbers by a single digit number.
		12. Divide numbers with remainders; e.g. 12 ÷ 5 =, 25 ÷ 6 (digit single quotients).

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Numbers, Number Sense and Operations – Standard B
GRADE 2

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Grade 1 Indicators	Grade 2 Indicators	Grade 3 Indicators
12. Use strategies for learning the basic subtraction facts for sums to 12; e.g., counting back, counting up from the number being subtracted, one less, two less. 13. Explain the relationship between operations such as subtraction is the inverse of addition; e.g., fact families to 12. 14. Add and subtract 2-digit numbers – no regrouping; e.g., using base 10 blocks, dimes and pennies, paper and pencil. 15. Estimate and solve problems involving addition and subtraction through the use manipulatives, pictures, drawings, and conventional symbols. 16. Model, and represent multiplication as combining equal groups. 17. Model and represent division as sharing equally. 18. Use a variety of methods and tools to compute, including objects, mental computation, estimation, paper and pencil, and calculators. 19. Represent commonly used fractions using physical models, pictures and words: halves (1/2, 2/2), thirds (1/3, 2/3, 3/3), fourths (1/4, 2/4, 3/4, 4/4). 20. Compare halves, thirds, and fourths, using physical models. 21. Identify and state the value of a penny, nickel, dime, quarter, half dollar, and dollar. 22. Count coin sets with values up to $1.00 using 1 or 2 different types of coins, consisting of pennies, nickels, dimes or quarters. 23. Show different coin exchanges for the same amount; e.g., show $.35 as a quarter and a dime, 3 dimes and 1 nickel, or 7 nickels.	11. Explain the relationship between operations such as subtraction is the inverse of addition; e.g., fact families to 18. 12. Model, and represent multiplication as combining equal groups and as repeated addition. 13. Model and represent division as sharing equally, and as repeated subtraction. 14. Estimate the results of whole number addition and subtraction problems, using rounding and front end estimation, and judge the reasonableness. 15. Use a variety of methods and tools to compute, including objects, mental computation, estimation, paper and pencil, and calculators. 16. Represent commonly used fractions using physical models, pictures, numerals and words: halves, thirds, fourths, sixths, eighths. 17. Identify and illustrate fractions as parts of a whole, and parts of a set of objects. 18. Compare and describe commonly used fractions using models: halves, thirds, fourths, eighths. 19. Count coin sets using any combination of coins consisting of pennies, nickels, dimes, quarters and half dollars, and write the values using a cent sign and in decimal form using a dollar sign. 20. Count money sets consisting of coins and bills up to $5.00. 21. Make change using coins and a dollar bill.	13. Divide 2 digit numbers by a single digit number, without remainders. 14. Model and use the commutative and associative properties for addition and multiplication using number sentences. 15. Represent fractions and mixed numbers using physical models, numerals, and words: 16. Compare and order commonly used fractions using physical or visual models; e.g. fraction circles or bars, number lines. 17. Explore equivalent forms of fractions found by using physical models and visual models. 18. Represent decimal numbers for tenths and hundredths using physical or visual models, numerals and words, and be able to write the fraction equivalents; e.g., 0.2, 2/10, two tenths. 19. Count money using coins and bills to ten dollars. 20. Make change using coins and bills for amounts up to $5.00. 21. Add and subtract decimals and amounts of money. 22. Explore numbers less than 0 by extending the number line and through familiar applications; e.g., temperature.

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Numbers, Number Sense and Operations – Standard B
GRADE 2

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Measurement Standard

Students estimate and measure to a required degree of accuracy and precision by selecting and using appropriate units, tools and technologies.

Grade 1	Grade 2	Grade 3
1. Estimate and measure <u>length</u> using non-standard <u>units</u>; e.g., student foot, paper clips. 2. Estimate and measure length using standard units; e.g., <u>inches</u>, <u>feet</u>, <u>centimeters</u>. 3. Recognize and explain the need for standard units and tools for measuring length and weight; e.g., <u>rulers</u> and <u>balance scales</u>. 4. Recognize the attributes of <u>length</u>, <u>capacity</u>, <u>weight</u>, and <u>time</u>. 5. Estimate and measure weight using non-standard units; e.g., blocks of uniform size, a book. 6. Estimate and measure capacity using non-standard units; e.g., small paper cups, 7. Select an appropriate unit and tool for the attribute being measured. 8. Relate the number of units required to the size of units; e.g., a smaller unit requires more, a larger unit requires less. 9. Recognize the reasonableness of a measurement. 10. Order a <u>sequence</u> of events with respect to time; e.g., seasons of the year; morning, afternoon and night. 11. Tell time to the <u>hour</u> and <u>half-hour</u> using digital and analog clocks.	1. Identify and select appropriate <u>customary</u> and <u>metric</u> units for measuring <u>length</u>; <u>inches</u>, <u>feet</u>, <u>yards</u>, <u>centimeters</u>, <u>meters</u> and recognize the abbreviations. 2. Use inches and centimeters to measure length; e.g., use a ruler to measure common objects, and to draw line segments using inches, half inches, and centimeters. 3. Identify and select appropriate units of measure for customary and metric <u>capacity</u>; <u>cups</u>, <u>pints</u>, <u>quarts</u>, <u>liters</u> and recognize the abbreviations. 4. Use cups and liters to measure capacity; e.g., use a measuring cup to place 2 cups of rice in a bowl. 5. Identify and select appropriate customary and metric units for measuring weight; <u>ounces</u>, <u>pounds</u>, <u>grams</u> and recognize the abbreviations. 6. Use pounds and grams to measure weight; e.g., use a scale to weigh 50 grams of candy or 1 lb. of candy. 7. Establish personal or common referents for units of measure to make estimates and comparisons; e.g., the width of a pinky finger is about a cm, a large bottle of pop is 2 liters, a small paper clip is weighs about one gram. 8. Estimate the length, capacity and weight of common objects using customary units and metric units. 9. Tell time to <u>5 minute intervals</u> and to the <u>quarter hr</u>. using digital and analog clocks. 10. Read and record <u>temperatures</u> in both <u>Fahrenheit</u> and <u>Celsius</u> degrees.	1. Identify and select appropriate <u>customary</u> and <u>metric</u> units for measuring <u>length</u>; <u>inches</u>, <u>feet</u>, <u>yards</u>, <u>miles</u>, <u>centimeters</u>, <u>decimeters</u>, <u>meters</u> and use abbreviations. 2. Use a ruler to measure length to the nearest inch, ½ in., ¼ in., centimeter, decimeter, meter; e.g., measure common objects; draw a rectangle with a length of 2 ½ in. and a width of 3 in. 3. Identify and select appropriate <u>customary</u> and <u>metric</u> units for measuring <u>capacity</u>; <u>cups</u>, <u>pints</u>, <u>quarts</u>, <u>gallons</u>, <u>centiliters</u>, <u>deciliters</u>, <u>liters</u> and use abbreviations. 4. Use cups, pints, quarts, gallons, centiliters, liters, to measure capacity; e.g., fill a measuring cup to the ¾ cup mark. 5. Identify and select appropriate <u>customary</u> and <u>metric</u> units for measuring <u>weight</u>; <u>ounces</u>, <u>pounds</u>, <u>tons</u>, <u>grams</u>, <u>kilograms</u> and use abbreviations. 6. Use ounces, pounds, grams, and kilograms to measure weight; e.g., use a scale to weigh and compare common objects. 7. Read thermometers in both <u>Fahrenheit</u> and <u>Celsius</u> scales. 8. Establish personal or common referents for units of measure to make estimates and comparisons; a paper clip is approximately one gram, the width of a pinky finger is approximately one cm, four times around a football field is approximately one mile, the width of a doorway is approximately one yard. 9. Tell time to the nearest minute using digital and analog clocks.

Grade 1	Grade 2	Grade 3
		10. Tell time using words; "before" and "after", "quarter to", "quarter after". 11. Calculate elapsed time using a clock (hrs. and half hours), and a calendar (days and weeks). 12. Demonstrate and describe perimeter as distance around a shape; area as covering a two-dimensional shape; volume as filling a three-dimensional shape. 13. Develop strategies for estimating the perimeters, areas, and volumes of regular and irregular shapes; e.g., links, tiles, cubes, grid paper.

Geometry and Spatial Sense Standard

Students identify, classify, compare and analyze characteristics, properties and relationships of one-, two- and three-dimensional geometric figures and objects. Students use spatial reasoning, properties of geometric objects, and transformations to analyze mathematical situations and solve problems.

Grade 1 Indicators	Grade 2 Indicators	Grade 3 Indicators
1. Recognize two-dimensional geometric shapes in the environment; circle, square, rectangle, triangles, or parallelogram. 2. Recognize three-dimensional structures in the environment; e.g., cylinders, cones, spheres, cubes, rectangular prisms. 3. Copy figures and draw simple two-dimensional shapes from memory. 4. Cover two-dimensional pictures or figures using paper shapes or tangrams. 5. Describe two-dimensional shapes using attributes such as number of sides and number of corners. 6. Build three-dimensional objects using blocks. 7. Compare and sort two and three-dimensional shapes according to their attributes, then explain reasoning for the groupings and comparisons. 8. Create new shapes by combining or cutting apart existing shapes. 9. Identify the shapes of the faces of three-dimensional objects. 10. Extend and use location words to include distance (near, far, close to) and directional words (left, right).	1. Identify and describe two-dimensional shapes; circle, square, rectangle, triangle, parallelogram, rhombus, and trapezoid. 2. Identify three-dimensional objects as cylinders, cones, spheres, cubes, rectangular prisms, pyramids. 3. Identify, compare, and sort three-dimensional objects according to the shape of the faces, the number of faces, number of edges, or number of vertices. 4. Investigate and predict the results of putting together and taking apart two and three-dimensional shapes. 5. Build a three-dimensional model based on an illustration or actual object using items such as legos, Lincoln logs, or wooden blocks. 6. Recognize and apply flips, slides and turns. 7. Recognize and create shapes that have symmetry. 8. Identify two-dimensional shapes as congruent (same shape and same size), or similar (same shape, different size).	1. Analyze and describe properties of two-dimensional and three-dimensional objects using terms such as vertex, edge, angle, side and face. 2. Build a three-dimensional model based on an illustration or actual object using items such as legos, Lincoln logs, or wooden blocks. 3. Identify two-dimensional shapes as congruent or similar. 4. Predict and describe the results of sliding, flipping, and turning two-dimensional shapes. 5. Draw lines of symmetry to verify symmetrical two-dimensional shapes. 6. Identify and describe right angles. 7. Use physical models, such as straws, to create different sized angles by opening and closing the sides. 8. Identify and draw angles with respect to right angles; greater than 90˚, less than 90˚, equal to 90˚. 9. Find and name locations on a labeled grid or coordinate plane.

Patterns, Functions and Algebra Standard

Students use patterns, relations and functions to model, represent and analyze problem situations that involve variable quantities, Students analyze, model and solve problems using various representations such as tables, graphs and equations.

Grade 1 Indicators	Grade 2 Indicators	Grade 3 Indicators
1. Analyze, describe, and extend sequences of sounds, shapes or simple number patterns; e.g., AABBabAABB…; □□◊◊◊□□◊… (Pattern blocks, attribute shapes); 1,3,1,3,… 2. Describe orally the basic unit or general plan of a repeating or growing pattern. 3. Sort, classify, and order objects by shape, size, number, and other properties and describe the attributes used; e.g., buttons, stickers, seashells. 4. Identify and write a short sentence to describe the attribute that was used to sort a group of items that have already been sorted. 5. Solve open sentences by representing an expression in more than one way using the commutative property; e.g., 4 + 5 = 5 + 4 or the number of blue blocks plus red blocks is the same as the number of red blocks plus the number of blue blocks (r + b = b + r). 6. Describe orally and model a problem situation using objects, pictures, or number sentences.	1. Extend simple number patterns, both repeating and growing patterns. 2. Use patterns to make generalizations and predictions; e.g., determine a missing element in a pattern. 3. Create new patterns with consistent rules or plans. 4. Describe the rule or general plan of existing patterns. 5. Model a problem situation using objects, pictures, numbers and other symbols. 6. Understand equivalence and extend the concept to situations involving symbols; e.g., 4 + 5 = 9 and 9 = 4 + 5, and 4 + 5 = 3 + 6 = Δ + □. 7. Use symbols to represent unknown quantities and identify values for symbols in an expression or equation using addition and subtraction; e.g., 7 + □ = 10; Δ - 2 = 5. 8. Describe qualitative change; e.g., a student growing taller. 9. Describe quantitative change; e.g., a student growing two inches in one year.	1. Analyze and extend increasing arithmetic (+) patterns, with or without a calculator, and describe the rules in words; e.g., 4,7,10,13,…; 6,11,16,21,… 2. Analyze and extend increasing geometric (x) patterns, with or without a calculator and describe the rule in words; e.g., 1,2,4,8,…; 1,3,9,27,… 3. Use patterns to make predictions, identify relationships, and solve problems. 4. Write, solve, and explain simple mathematical statements, such as 7 + □ > 8 or Δ + 8 = 12. 5. Create tables to discover patterns and rules; e.g., input/output tables. 6. Model problem situations using objects, pictures, tables, numbers, letters and other symbols. 7. Express mathematical relationships as equations and inequalities. 8. Identify and describe quantitative changes, especially those involving addition and subtraction; e.g., the heights of water in a glass becoming 1 centimeter lower each week due to evaporation. 9. Investigate ways a change in one variable relates to a change in a second variable by simulating an input/output machine; e.g., "x +12 machine" means if 8 goes in 20 comes out, or 1 sandwich costs $0.99, so 2 cost _____?

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Patterns, Functions and Algebra – Standard E
GRADE 2

Diocese of Toledo
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Data Analysis and Probability Standard

Students pose questions and collect, organize, represent, interpret and analyze data to answer those questions. Students develop and evaluate inferences, predictions and arguments that are based on data.

Grade 1 Indicators	Grade 2 Indicators	Grade 3 Indicators
1. Collect data about everyday situations and familiar objects and organize into <u>tables</u> and <u>charts</u> using <u>tally marks</u>; e.g., data collected from <u>surveys</u> (favorite pets, favorite foods) and data collected over a period of time. 2. Identify <u>multiple categories</u> for sorting objects and data. 3. Display collected data in <u>bar graphs</u> and <u>picture graphs</u> with intervals of 1. 4. Read and interpret information on <u>charts</u> and <u>graphs</u>; e.g. answer questions about the number of objects represented in a <u>picture graph</u>, <u>bar graph</u> or <u>table</u>; how many more in a category compared to another, or how many altogether in two categories. 5. Construct a question that can be answered by using information from a graph. 6. Read and use <u>time lines</u> to display a <u>sequence</u> of events. 7. Discuss and describe the likelihood of simple events as <u>possible/impossible</u> and <u>more likely/less likely</u>; e.g., when using spinners or number cubes in classroom activities.	1. Pose questions and collect data through <u>observations</u>, <u>interviews</u> and <u>surveys</u>. 2. Organize data into <u>tables</u> and <u>charts</u> using <u>tally marks</u>. 3. Display collected data in picture graphs with units of 1 or 2 and <u>bar graphs</u> and <u>line plots</u> with intervals of 1 or 2. 4. Recognize that data may vary from one <u>population</u> to another; e.g., favorite foods or favorite TV shows of parents and students. 5. Read, interpret, compare, and make predictions from data represented in <u>charts</u>, <u>tables</u>, <u>bar graphs</u>, <u>picture graphs</u> and <u>line plots</u>. 6. Write sentences to describe and compare categories of data represented in a chart or graph, and make statements about the data as a whole. 7. Read, use and construct <u>time lines</u> to display a <u>sequence</u> of events. 8. Identify <u>untrue</u> or <u>inappropriate</u> statements about a given set of data. 9. List some of the possible <u>outcomes</u> of a simple experiment, and predict whether given outcomes are <u>more</u>, <u>less</u>, or <u>equally likely</u> to occur. 10. Use physical models and pictures to represent possible <u>arrangements</u> of 2 or 3 objects.	1. Collect and organize data from an experiment, such as recording and classifying observations or measurements in response to a question posed. 2. Interpret and construct <u>picture graphs</u> in which a symbol or picture represents more than one object. 3. Interpret and construct <u>bar graphs</u> with intervals greater than one; e.g., intervals of 2, 5, or 10. 4. Support a <u>conclusion</u> orally and in writing, using information in a table or a graph. 5. Match a set of data with a <u>graphical representation</u> of that data. 6. Fluently translate data among <u>charts</u>, <u>tables</u>, <u>line plots</u>, <u>picture graphs</u>, and <u>bar graphs</u>. 7. Analyze and interpret information represented on a <u>time line</u>. 8. Identify the <u>mode</u> of a data set and describe the information it gives about the data set. 9. Conduct a simple experiment, record the results in a chart, table or graph. Use results to draw conclusions about <u>possible outcomes</u>. 10. Use physical models, pictures, diagrams, and lists to solve problems involving possible <u>arrangements</u> or <u>combinations</u> of two to four objects.

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Data Analysis and Probability – Standard F
GRADE 2

Diocese of Toledo
Mathematics Course of Study
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