



Mathematics Standards

2019

Mathematics Standards 2019

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Algebra Think Tank

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Grade Level Standards Writing Teams

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	Gina Kolibab	Saint Aloysius
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Standards Creation Process

Beginning with the end in mind, the 2018 revision of the Archdiocese of Louisville Standards commenced with the gathering of an Eighth Grade Algebra Think Tank. After careful review of historical data from the Algebra program, this committee, comprised of community, post-secondary, high school and middle school stakeholders, recommended that the Eighth Grade Algebra program continue under the course name Foundational Algebra. The program is designed to provide foundational Algebra skills that will prepare students for one of three secondary school paths according to the unique mathematics program at each high school:

1. Placement beyond Algebra 1
2. Placement in accelerated high school Algebra
3. Placement in Algebra 1 with requisite foundational skills for success

The concept mastery list for Foundational Algebra was revised to more closely align with the expectations of a secondary school Algebra I course; this list was then used as a guiding document for the middle school math standards included in this document.

In addition to guidance from the Algebra Think Tank, the Office of Catholic Schools sought the expertise of community and post-secondary leaders in math education to set the visions and goals of this document. The thirty-three writers of these standards were either administrators with math education backgrounds or experienced classroom teachers recommended by their administrators; the team represented schools of various sizes and schools within and outside Jefferson County.

The team of writers met initially to set goals and visions for the document. Next they met in grade level specific and leveled teams to write and align the standards. The writers acknowledge using the following foundational documents to complete their work:

1. The Common Core State Standards for Mathematics (2010)
2. The Kentucky Academic Standards for Mathematics (2018)
3. The Archdiocese of Chicago Benchmark Report for Mathematics (2015)

Information from the following publications were also used to guide the writing of these standards:

1. National Council of Teachers of Mathematics (NCTM). 2008. *Principles and Standards for School Mathematics*. Reston, VA: NCTM.
2. National Council of Teachers of Mathematics (NCTM). (2014). *Principles to Actions: Ensuring Mathematical Success for All*. Reston, VA: NCTM.
3. Ontario Education. (2007). *A Guide to Effective Instruction in Mathematics Kindergarten to Grade 3: Data Management and Probability*. Ontario: Queen's Printer.
4. Ontario Education. (2008). *A Guide to Effective Instruction in Mathematics: Data Management and Probability Grades Four to Six*. Ontario: Queen's Printer.

Writers' Vision

Guided by the ideas that math education in the Archdiocese of Louisville required a fresh vision and that a growth mindset is critical to mathematics success for all, the writers of these standards consistently placed students at the forefront of the mathematics standards revision and development work. The driving question was simple, "What is best for Archdiocese of Louisville students?" In each decision, the writers focused on the critical knowledge, skills and capacities students will need for success in an ever changing global economy. The development of conceptual understanding was considered in equal measure to the development of procedural fluency. The writers envisioned standards that call for exposure to a range of strategies and approaches and encouragement of students through productive struggle with mathematic problem solving. Every effort was made to provide students with opportunities to explore math concepts in real world contexts. In accordance with the call from the National Council of Teachers of Mathematics in *Principles to Actions: Ensuring Mathematics Success for All*, the local writers embraced the vision that "Effective teaching engages students in meaningful learning through individual and collaborative experiences that promote their ability to make sense of mathematical ideas and reason mathematically." (NCTM, 2014, p.7)

Additionally, the writers were committed to enhancing the standards' clarity and function so Archdiocese of Louisville teachers would be better equipped to provide high quality, cognitively demanding mathematics education for each and every student. The writers call upon math teachers in the Archdiocese of Louisville to embrace the core set of high leverage practices that ensure deep learning in mathematics laid out by the National Council for Teachers of Mathematics in *Principles to Actions: Ensuring Mathematics Success for All* (NCTM, 2014, p. 10):

1. Establish mathematics goals to focus learning.
2. Implement tasks that promote reasoning and problem solving.
3. Use and connect mathematical representations.
4. Facilitate meaningful mathematical discourse.
5. Pose purposeful questions.
6. Build procedural fluency from conceptual understanding.
7. Support productive struggle in learning mathematics.
8. Elicit and use evidence of student learning.

Catholic Schools and the Common Core State Standards

Catholic schools have a long-standing commitment to academic excellence that is rooted in the faith-based mission of Catholic education. The Common Core State Standards in no way compromise the Catholic Identity or educational program of a Catholic school.

The Common Core State Standards are a set of high-quality academic expectations that all students should master by the end of each grade level, but they are not a curriculum. A curriculum includes what is taught, how it is taught, and what materials to use. None of these are included in the Common Core State Standards or in this document. In the Archdiocese of Louisville, all of these elements will continue to be determined by curriculum specialists, principals and teachers working to meet the needs of their students.

The Archdiocese of Louisville has adopted the Common Core State Standards as a baseline set of standards, making adaptations to ensure a rigorous academic curriculum that integrates faith and knowledge. As trained professionals, Catholic administrators and teachers will continue to seek the best instructional methods for educating each student.

Standards, Not Curriculum

The Archdiocese of Louisville Mathematics Standards do not dictate curriculum or teaching methods. Learning opportunities and pathways will continue to vary across schools; educators should make every effort to meet the needs of individual students based on their pedagogical and professional impressions and information. The order in which the standards are presented is not the order in which the standards need to be taught. Standards from various domains are connected and educators will need to determine the best overall design and approach, as well as the instructional materials and strategies needed to support their learners to attain grade-level expectations and the knowledge articulated in these standards.

Organization of the Standards

The Archdiocese of Louisville Mathematics Standards are organized under the same mathematics domains used in the Common Core State Standards.

Domain	Code	Kinder- garten	Grade One	Grade Two	Grade Three	Grade Four	Grade Five	Grade Six	Grade Seven	Grade Eight (Foundational Algebra)
Counting and Cardinality	CC									
Operations and Algebraic Thinking	OA									
Numbers and Operations in Base Ten	NBT									
Measurement and Data	MD									
Geometry	G									
Numbers and Operations-Fractions	NF									
Ratios and Proportional Relationships	RP									
The Number System	NS									
Expressions and Equations	EE									
Statistics and Probability	SP									
Seeing Structure in Equations Arithmetic with Polynomials and Rational Expressions Creating Equations Reasoning with Equations and Inequalities	SSE APR CED REI									
Functions	F									

Within these domains, standards are organized under clusters that group related standards. Writers linked each cluster to Suggested Mathematical Practices to encourage the relationship between the *Standards for Mathematical Practice* and *Content Standards*. The use of these mathematical practices demonstrates various applications of the standards and encourages a deeper understanding of the content.

How to Read the Standards

Domains are large groups of related standards. The same domains run through multiple grade levels. Standards from different domains are often closely related.

Clusters summarize groups of related standards. Note that standards from different clusters are often closely related because mathematics is a connected subject.

Standards for Mathematical Content define what students should understand and be able to do.

Standards for Mathematical Practice define how students engage in mathematical thinking.

Essential Standards

Writers identified *Essential Standards* among the Archdiocese of Louisville Mathematics Standards. Standards identified as essential were evaluated according to three criteria:

1. They have endurance. The knowledge and skills in this standard are valuable beyond a single mathematics unit of study.
2. They have leverage. The knowledge and skills in this standard are valuable in multiple disciplines.
3. They demand readiness. The knowledge and skills in this standard are essential for success at the next grade level.

If a standard is noted as essential, the goal is that every student at that particular grade level will achieve some level of mastery with the standard by the end of the academic year.

Standards not marked as essential must still be taught at every grade level. Knowledge and skills in these standards are critical for success with *Essential Standards* at subsequent grade levels.

Conceptual and Procedural Classification

Local writers of these Standards for Mathematical Content tried to balance procedural and conceptual learning. Students who lack understanding of a topic may rely on procedures too heavily. Without a flexible base from which to work, they may be less likely to consider analogous problems, represent problems coherently, justify conclusions, apply the mathematics to practical situations, use technology mindfully to work with the mathematics, explain the mathematics accurately to other students, step back for an overview or deviate from a known procedure to find a shortcut.

Therefore writers categorized each standard as either conceptual **C** or procedural **P** to help teachers discern between these two important facets of mathematics learning. Conceptual learning involves understanding and interpreting concepts and the relationships between concepts. Procedural learning, on the other hand, involves facts, skills, procedures, algorithms, and methods that can be used to accelerate computation. Every effort was made to adhere to the research based progression of math learning, firmly grounding procedural exposure in deep conceptual understanding. In some cases, standards require both conceptual and procedural effort. A healthy balance of conceptual and procedural standards are evident at all grade levels in the Archdiocese of Louisville Math Standards document.

Connecting the Standards for Mathematical Practices to the Standards for Mathematical Content

The Standards for Mathematical Practice included in the Common Core State Standards and adopted by the Archdiocese of Louisville help teachers connect how students are learning—mathematical practice—with what they are learning—mathematical content. Because students should increasingly engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary and middle school years, the same mathematical practices can and should be addressed at all grade levels. Instructional material selections, assessments and professional development at each school should attend to the need to connect the mathematical practices to mathematical content in mathematics instruction.

To assist teachers in connecting Mathematical Practices to Mathematical Content, the writers have suggested practices for each cluster of content standards. These suggested practices serve as an entry point for teachers to ensure students are developing sound mathematical practices as they grapple with grade level content. Of course, teachers will find that all the mathematical practices relate to all content; the writers' suggestions are merely a place to start.

Standards for Mathematical Practice

“The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important “processes and proficiencies” with longstanding importance in mathematics education. The first of these are the National Council of Teachers of Mathematics (NCTM) process standards of problem solving, reasoning and proof, communication, representation and connections. The second are the strands of mathematical proficiency specified in the National Research Council’s 2001 report Adding It Up: adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately) and productive disposition (habitual inclination to see mathematics as sensible, useful and worthwhile, coupled with a belief in diligence and one’s own efficacy).” (CCSS, 2010)

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

1. Make sense of problems and persevere in solving them.

“Mathematically proficient students start by explaining the meaning of a problem and looking for entry points to its solution.” (CCSS 2010)

Students use this practice when they consider the givens, the constraints the relationships and the goals of problems. They try several times to solve problems, evaluating progress and changing course if necessary. They check the reasonableness of a solution by repeatedly asking, “Does this make sense?,” and appreciate multiple solutions to the same problem.

In student friendly language, this mathematical practice could be expressed, “I can try many times to understand and solve a math problem.”

2. Reason abstractly and quantitatively.

“Mathematically proficient students make sense of quantities and their relationships in problem situations.” (CCSS 2010)

Students use this practice when they explain what each number represents. They attend to the meaning of quantities and their relationship to each other before computing with them. They create logical (symbolic or manipulative) representations of the problem, and identify what property and/or operation will help solve the problem.

In student friendly language, this mathematical practice could be expressed, “I can think about the math problem in my head first.”

3. Construct viable arguments and critique the reasoning of others.

“Mathematically proficient students understand and use stated assumptions, definitions and previously established results in constructing arguments.” (CCSS 2010)

Students use this practice when they justify conclusions with mathematical ideas. They listen to the arguments of others and ask sensible questions about its efficacy. They make useful suggestions to improve or revise a strategy. Given two arguments for a solution, students can determine the correct and/or flawed logic.

In student friendly language, this mathematical practice could be expressed, “I can explain and justify my thinking, listen critically to other ideas and ask questions to decide if they make sense.”

4. Model with mathematics.

“Mathematically proficient students can apply the mathematics they know to solve problems that arise in everyday life.” (CCSS 2010)

Students use this practice when they recognize math in everyday life, and find ways to simplify complex problems. They use pictures, words, object and symbols to solve problems, and make use of number line and array representations in computation and solutions. They reflect on whether results make sense to make improvements to their models.

In student friendly language, this mathematical practice could be expressed, “I can explain math situations using objects, drawings, symbols, and equations.”

5. Use appropriate tools strategically.

“Mathematically proficient students consider the available tools when solving a mathematical problem.” (CCSS 2010)

Students use this practice when they recognize the strength and limitations of available math tools, including pencil and paper, concrete models, rulers, protractors, calculators, spreadsheets, etc. They use technological tools to deepen and explore their understanding. They begin with an estimation and use it to decide if the chosen tool was effective.

In student friendly language, this mathematical practice could be expressed, “I can decide which tool will best help me solve the problem.”

6. Attend to precision.

“Mathematically proficient students try to communicate precisely to others.” (CCSS 2010)

Students use this practice when they choose between estimation and precision to solve a problem. They use appropriate vocabulary to discuss their reasoning with others, and use units to give meaning to numbers. They calculate efficiently and accurately and express answers with an appropriate precision for their grade level.

In student friendly language, this mathematical practice could be expressed, “I can work carefully and check my work.”

7. Look for and make use of structure.

“Mathematically proficient students look closely to discern a pattern or structure.” (CCSS 2010)

Students use this practice when they make connections between mathematical ideas and apply general mathematical rules to specific situations. They see and understand how numbers and shapes are put together as parts and wholes. They think about other problems they have solved that might help with a new problem.

In student friendly language, this mathematical practice could be expressed, “I can find patterns and use prior knowledge to solve new problems.”

8. Look for and express regularity in repeated reasoning.

“Mathematically proficient students notice if calculations are repeated and look both for general methods and shortcuts.” (CCSS 2010)

Students use this practice when they see the overall process of a problem while still paying attention to details. They understand the broader application of patterns and seek structure in similar situations, developing shortcuts as it is discovered. They constantly assess the reasonableness of intermediate results.

In student friendly language, this mathematical practice could be expressed, “I can notice when calculations are repeated and then find more general methods and shortcuts.”

Archdiocese of Louisville Mathematics Standards

Kindergarten

Archloun Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.K	K.CC.		Counting and Cardinality (CC)		
OCS.Math.K.1	K.CC.A		Know number names and the count sequence.		2, 7, 8
OCS.Math.K.1a	K.CC.A.1	*	Count to 100 by ones	P	
OCS.Math.K.1b	K.CC.A.1		Count to 100 by tens	P	
OCS.Math.K.1c	K.CC.A.2	*	Count forward beginning from any given number up to 100	P	
OCS.Math.K.1d			Count backwards from 30 by ones	P	
OCS.Math.K.1e			Identify numbers up to 100	P	
OCS.Math.K.1f	K.CC.A.3		Write numbers from 0 to 30	P	
OCS.Math.K.1g	K.CC.A.3	*	Represent a number of objects with a written number 0-20	C	
OCS.Math.K.1h			Identify sequence of ordinal numbers from first to tenth	C	
OCS.Math.K.2	K.CC.B		Count to tell the number of objects.		2, 3, 5, 7, 8
OCS.Math.K.2a	K.CC.B.4	*	Relate counting to a quantity	C	
OCS.Math.K.2b	K.CC.B.4.B	*	Identify that the last number stated tells the number of objects	C	
OCS.Math.K.2c	K.CC.B.4.C		Articulate that each successive number name refers to a quantity that is one larger	C	
OCS.Math.K.2d	K.CC.B.5	*	Count up to 20 objects with one to one correspondence in different configurations (line, circle, scattered)	C	
OCS.Math.K.3	K.CC.3		Compare numbers.		1, 2, 3, 5, 7
OCS.Math.K.3a	K.CC.C.6	*	Identify whether the number of objects (0-20) in one group is greater than, less than, or equal to the number of objects in another group	C	
OCS.Math.K.3b	K.CC.C.7		Compare two numbers between 1 and 10 presented as written numerals	C	

Archdiocese of Louisville Mathematics Standards

Kindergarten

Archloun Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.K	K.OA		Operations and Algebraic Thinking (OA)		
OCS.Math.K.4	K.OA.A		<i>Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from.</i>		1, 2, 4, 5, 6, 7, 8
OCS.Math.K.4a		*	Define addition as putting objects together and adding to	C	
OCS.Math.K.4b	K.OA.A.1	*	Represent addition with objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, expressions or equations	C	
OCS.Math.K.4c	K.OA.A.2	*	Solve addition word problems with numbers up to 10 using objects or drawings	C	
OCS.Math.K.4d	K.OA.A.5	*	Add numbers to the sum of 5 fluently	P	
OCS.Math..4e	K.OA.A.4		Determine the number that makes ten when added to a given number	P	
OCS.Math..4f	K.OA.A.3		Decompose numbers less than or equal to 10 into pairs in more than one way	C	
OCS.Math..4g		*	Define subtraction as taking apart and taking from	C	
OCS.Math.K.4h	K.OA.A.1	*	Represent subtraction with objects, fingers, mental images, drawings, sounds, acting out situations, verbal explanations, expressions or equations	C	
OCS.Math.K.4i	K.OA.A.2	*	Solve subtraction word problems with numbers up to 10 using objects or drawings	C	
OCS.Math.K.4j	K.OA.A.5	*	Fluently subtract using numbers 0-5	P	
OCS.Math.K.4k	K.OA.A.1	*	Write number sentences using symbols (+, - and =) and words (3 and 1 is 4)	P	
OCS.Math.K	K.NBT		Number and Operations in Base Ten (NBT)		
OCS.Math.5	K.NBT.A		<i>Work with numbers 11–19 to gain foundations for place value.</i>		3, 4, 5, 7
OCS.Math.5a	K.NBT.A.1	*	Compose numbers from 11 to 19 into a group of ten and additional ones	C	
OCS.Math.5b	K.NBT.A.1	*	Decompose numbers from 11 to 19 into a group of ten and additional ones	C	

Archdiocese of Louisville Mathematics Standards

Kindergarten

Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.K	K.MD		Measurement and Data (MD)		
OCS.Math.K.6	K.MD.A		Describe and compare measurable attributes.		2, 3, 5, 6
OCS.Math.K.6a	K.MD.A.1	*	Describe measurable attributes of objects (length , height, weight, and volume) of an object or a set of objects	C	
OCS.Math.K.6b	K.MD.A.2	*	Compare two objects with a measurable attribute in common, to see which object has "more of"/"less of" the attribute, and describe the difference	C	
OCS.Math.K.6c			Measure length, height, weight, and volume using nonstandard units	C	
OCS.Math.K.6d			Recognize measurement in real life	C	
OCS.Math.K.6e			Identify standard measuring tools	P	
OCS.Math.K.7	K.MD.B		Classify objects and count the number of objects in each category.		3, 6, 7
OCS.Math.K.7a	K.MD.B.3	*	Classify and sort objects by attributes	C	
OCS.Math.K.8			Tell and write time.		4, 5, 6, 8
OCS.Math.K.8a			Identify the features of an analog clock	P	
OCS.Math.K.9			Work with money.		4, 5, 6
OCS.Math.K.9a		*	Identify the name of coins (penny, nickel, dime, quarter)	P	
OCS.Math.K.10			Work with a calendar.		1, 4, 5, 6, 7, 8
OCS.Math.K.10a			Name the days of the week	P	
OCS.Math.K.10b			Name the months of the year	P	
OCS.Math.K.11			Understand and apply the statistics process.		2, 3, 4
OCS.Math.K.11a		*	Collect and organize data to create tally charts and pictographs	C	
OCS.Math.K.11b			Use tally charts and pictographs to answer questions	C	
OCS.Math.K.11c			Describe the likelihood of everyday events using simple language (never, sometimes, always, etc.)	C	
OCS.Math.K.11d			Describe events as possible or impossible	C	
OCS.Math.K.11e			Investigate probability in simple games and probability experiments	C	

Archdiocese of Louisville Mathematics Standards

Kindergarten

Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.K	K.G		Geometry (G)		
OCS.Math.K.12	K.G.A		Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).		3, 6, 7
OCS.Math.K.12a	K.G.A.2	*	Identify two-dimensional shapes (squares, circles, triangles, rectangles, hexagons) regardless of orientation or size	P	
OCS.Math.K.12b	K.G.A.3		Name the attributes of two-dimensional shapes (squares, circles, triangles, rectangles, hexagons)	C	
OCS.Math.K.12c	K.G.A.2	*	Identify three-dimensional shapes (cubes, cones, cylinders, spheres) regardless of orientation or size	P	
OCS.Math.K.12d	K.G.A.3		Name the attributes of three-dimensional shapes (cubes, cones, cylinders, spheres)	C	
OCS.Math.K.12e	K.G.A.1	*	Describe the relative positions of objects using terms above, below, in front of, behind and next to	C	
OCS.Math.K.13	K.G.B		Analyze, compare, create, and compose shapes.		1, 3, 4, 5, 7
OCS.Math.K.13a	K.G.B.4	*	Describe the similarities, differences and attributes of two and three-dimensional shapes using sizes and orientations	C	
OCS.Math.K.13b	K.G.B.5		Model shapes in the world by building shapes from components and drawing shapes	C	
OCS.Math.K.13c	K.G.B.6		Compose simple shapes to form larger shapes	C	

Archdiocese of Louisville Mathematics Standards

Grade One

Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.1	1.OA		Operations and Algebraic Thinking (OA)		
OCS.Math.1.1	1.OA.A		Represent and solve problems involving addition and subtraction.		1, 2, 4, 5
OCS.Math.1.1a	1.OA.A.1	*	Add numbers up to 20 to solve word problems using objects, drawings and equations with a symbol for the unknown number	C	
OCS.Math.1.1b	1.OA.A.1	*	Subtract numbers from up to 20 to solve word problems using objects, drawings and equations with a symbol for the unknown number	C	
OCS.Math.1.1c	1.OA.A.2		Solve word problems that call for addition of three whole numbers whose sum is less than or equal to 20 using objects, drawings, and equations with a symbol for the unknown number	C	
OCS.Math.1.2	1.OA.B		Understand and apply properties of operations and the relationship between addition and subtraction.		2, 3, 7
OCS.Math.1.2a	1.OA.B.3		Apply properties of operations (commutative and associative) as strategies to add and subtract	P	
OCS.Math.1.2b	1.OA.B.4		Use subtraction to solve unknown-addend problem with numbers up to 20	P	
OCS.Math.1.3	1.OA.C		Add and subtract within 20.		2, 5, 7, 8
OCS.Math.1.3a	1.OA.C.5	*	Relate counting to addition and subtraction	C	
OCS.Math.1.3b	1.OA.C.6		Add numbers up to 20 using mental strategies	P	
OCS.Math.1.3c	1.OA.C.6		Subtract numbers from 20 using mental strategies	P	
OCS.Math.1.3d		*	Add numbers up to 10 fluently	P	
OCS.Math.1.3e		*	Subtract numbers from 10 fluently	P	
OCS.Math.1.4	1.OA.D		Work with addition and subtraction equations.		1, 2, 3
OCS.Math.1.4a	1.OA.D.7	*	Explain the meaning of the equal sign in an addition and subtraction equation	C	
OCS.Math.1.4b	1.OA.D.7		Determine whether equations involving addition and subtraction are true or false	C	
OCS.Math.1.4c	1.OA.D.8		Determine the unknown whole number in an addition or subtraction equation involving three whole numbers	P	

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Grade One

Archloun Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.1	1.NBT		Number and Operations in Base Ten (NBT)		
OCS.Math.1.4	1.NBT.A		Extend the counting sequence.		2, 5, 8
OCS.Math.1.4a	1.NBT.A.1	*	Count forward from any given number up to 120	P	
OCS.Math.1.4b			Count backward from any given number less than 120	P	
OCS.Math.1.4c			Count to 120 by fives and tens; count to 30 by twos	P	
OCS.Math.1.4d	1.NBT.A.1	*	Identify numerals from 0-120	P	
OCS.Math.1.4e	1.NBT.A.1	*	Write numerals from 0-120	P	
OCS.Math.1.4f	1.NBT.A.1	*	Represent a number of up to 120 objects with a written numeral	P	
OCS.Math.1.5	1.NBT.B		Understand place value.		2, 5, 7
OCS.Math.1.5a	1.NBT.B.2	*	Explain the two digits of a two-digit number in amounts of tens and ones	C	
OCS.Math.1.5b			Model addition and subtraction within 20 (using counters, base-ten blocks, and drawings)	C	
OCS.Math.1.5c	1.NBT.B.3		Compare two two-digit numbers based on a breakdown into tens and ones	C	
OCS.Math.1.5d	1.NBT.B.3	*	Record the results of comparisons between two two-digit numbers using the symbols >, =, and <	P	
OCS.Math.1.6	1.NBT.C		Use place value understanding and properties of operations to add and subtract.		2, 3, 5, 7, 8
OCS.Math.1.6a	1.NBT.C.4	*	Add a two-digit and a one-digit number in amounts of tens and ones	C	
OCS.Math.1.6b	1.NBT.C.4		Add a two-digit number and multiple of 10 using numbers up to 100	C	
OCS.Math.1.6c	1.NBT.C.5		Add 10 to a two-digit number mentally and explain the reasoning used	C	
OCS.Math.1.6d	1.NBT.C.5		Subtract 10 from a two-digit number mentally and explain the reasoning used	C	
OCS.Math.1.6e	1.NBT.C.6		Subtract multiples of 10 in the range 10-90 from multiples of 10 in the range 10-90 leading to positive or zero differences and explain the reasoning used	C	

Archdiocese of Louisville Mathematics Standards

Grade One

Archloun Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.1	1.MD		Measurement and Data (MD)		
OCS.Math.1.7			Understand measurable attributes of objects and the units, systems, and processes of measurement		5, 6, 7
OCS.Math.1.7a			Select an appropriate unit and tool for the attribute being measured	P	
OCS.Math.1.7b			Identify everyday real world uses of measurement	C	
OCS.Math.1.8	1.MD.A		Measure lengths indirectly and by iterating length units.		2, 5, 6
OCS.Math.1.8a	1.MD.A.1	*	Order three objects by length	P	
OCS.Math.1.8b	1.MD.A.1		Compare the lengths of two objects indirectly by using a third object	C	
OCS.Math.1.8c	1.MD.A.2	*	Record the length of an object as a whole number of length units (inches)	P	
OCS.Math.1.8d			Determine whether inches or centimeters is a more accurate unit of measure for an object	C	
OCS.Math.1.8e	1.MD.A.2		Relate the length measurement of an object to the number of same-size length units that span it with no gap or overlaps	P	
OCS.Math.1.9	1.MD.B		Tell and write time.		5, 6
OCS.Math.1.9a	1.MD.B.3	*	Write time in hours and half-hours using analog and digital clocks	P	
OCS.Math.1.9b	1.MD.B.3	*	Tell time in hours and half-hours using analog and digital clocks	P	
OCS.Math.1.10			Work with money.		2, 5, 6
OCS.Math.1.10a		*	Identify the value of each coin (penny, nickel, dime, quarter)	P	
OCS.Math.1.10b		*	Identify coin combinations whose value equals that of a single coin	P	
OCS.Math.1.11			Work with a calendar.		5, 6, 8
OCS.Math.1.11a		*	Locate and identify days and dates on a calendar	P	
OCS.Math.1.12	1.MD.C		Understand and apply the statistics process.		1, 3, 4, 6
OCS.Math.1.12a	1.MD.C.4		Pose a question that can be answered by gathering data	C	
OCS.Math.1.12b			Determine strategy for gathering data from peers	C	
OCS.Math.1.12c	1.MD.C.4	*	Organize and represent data in a table, chart, bar graph or pictograph with up to three categories	C	
OCS.Math.1.12d	1.MD.C.4	*	Interpret data to answer questions about the table, chart, bar graph or pictograph that connects to the question posed	C	
OCS.Math.1.12e			Describe the likelihood of an event using mathematical language (impossible, unlikely, less likely, more likely, certain, etc.)	C	
OCS.Math.1.12f			Compare the likelihood of events	C	
OCS.Math.1.12g			Make predictions based on past experience	C	
OCS.Math.1.12h			Explore probability in simple games and probability experiments	C	

Archdiocese of Louisville Mathematics Standards

Grade One

Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.1	1.G		Geometry (G)		
OCS.Math.1.13	1.G.A		<i>Reason with shapes and their attributes.</i>		1, 3, 4, 6, 7
OCS.Math.1.13a	1.G.A.1	*	Distinguish between defining attributes versus non-defining attributes of shapes	C	
OCS.Math.1.13b	1.G.A.1	*	Build and draw shapes that demonstrate defining attributes	P	
OCS.Math.1.13c			Investigate and predict the results of putting together and taking apart two- and three-dimensional shapes	C	
OCS.Math.1.13d	1.G.A.3	*	Partition circles and rectangles into two and four equal shares	P	
OCS.Math.1.13e	1.G.A.3	*	Describe two and four shares of partitioned circles and rectangles using words and phrases (halves, fourths, quarters, half of, fourth of, and quarter of)	P	
OCS.Math.1.13f	1.G.A.3		Describe a whole in terms of shares	P	

Archdiocese of Louisville Mathematics Standards

Grade Two

Archloun Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.2	2.OA		Operations and Algebraic Thinking (OA)		
OCS.Math.2.1	2.OA.A		<i>Represent and solve problems involving addition and subtraction.</i>		1, 2, 4, 5, 6
OCS.Math.2.1a	2.OA.A.1	*	Add and subtract numbers up to 100 to solve one and two step word problems	P	
OCS.Math.2.1b	2.OA.A.1	*	Use drawings and equations with a symbol for the unknown number to solve one and two step word problems.	C	
OCS.Math.2.2	2.OA.B		<i>Add and subtract within 20.</i>		5, 6, 7, 8
OCS.Math.2.2a	2.OA.B.2	*	Fluently add numbers up to the sum of 20 using mental strategies	P	
OCS.Math.2.2c	2.OA.B.2	*	Fluently subtract using numbers 0-20 with mental strategies	P	
OCS.Math.2.3	2.OA.C		<i>Work with equal groups of objects to gain foundations for multiplication.</i>		2, 4, 5, 7
OCS.Math.2.3a	2.OA.C.3		Determine whether a group of 20 or fewer objects has an odd or even number of members	C	
OCS.Math.2.3b	2.OA.C.3		Write an equation to express an even number as a sum of two equal addends	C	
OCS.Math.2.3c	2.OA.C.4		Add objects arranged in a rectangular array with up to 5 rows and 5 columns	P	
OCS.Math.2.3d	2.OA.C.4		Represent repeated addition by writing an addition equation to express the total of a rectangular array with up to 5 rows and 5 columns as a sum of equal addends	C	

Archdiocese of Louisville Mathematics Standards

Grade Two

Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.2	2.NBT		Number and Operations in Base Ten (NBT)		
OCS.Math.2.4	2.NBT.A		Understand place value.		2, 5, 6, 7, 8
OCS.Math.2.4a	2.NBT.A.1	*	Explain that the three digits of a three-digit number represent amounts of hundreds, tens and ones and model with base ten blocks and/or other representations	C	
OCS.Math.2.4b	2.NBT.A.2	*	Count forwards and backwards within 1000; skip-count by twos, fives, tens and hundreds from a given number	P	
OCS.Math.2.4c	2.NBT.A.3		Read and write numbers up to 1000 using base-ten numerals, number names, and expanded form	P	
OCS.Math.2.4d			Round numbers up to 1000 to the nearest ten and hundred	P	
OCS.Math.2.4e		*	Order numbers within the range of 0-1000	P	
OCS.Math.2.4f	2.NBT.A.4	*	Compare two three-digit numbers based on meanings of the hundreds, tens and ones digits, using >, =, and < symbols to record the results of comparisons	C	
OCS.Math.2.5	2.NBT.B		Use place value understanding and properties of operations to add and subtract.		1, 2, 3, 5, 6, 7
OCS.Math.2.5a	2.NBT.B.5	*	Add 2 two-digit numbers using strategies based on place value	C	
OCS.Math.2.5b	2.NBT.B.5	*	Subtract 2 two-digit numbers using strategies based on place value	C	
OCS.Math.2.5c	2.NBT.B.6		Add up to four two-digit numbers	P	
OCS.Math.2.5d	2.NBT.B.7		Add 2 three-digit numbers using strategies based on place value	C	
OCS.Math.2.5e	2.NBT.B.7		Subtract 2 three-digit numbers using strategies based on place value	C	
OCS.Math.2.5f	2.NBT.B.8	*	Add 10 or 100 to a given number between 100-900 using mental strategies	P	
OCS.Math.2.5g	2.NBT.B.8	*	Subtract 10 or 100 from a given number between 100-900 using mental strategies	P	
OCS.Math.2.5h	2.NBT.B.9	*	Explain the process of adding and subtracting numbers up to 1000	C	

Archdiocese of Louisville Mathematics Standards

Grade Two

Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.2	2.MD		Measurement and Data (MD)		
OCS.Math.2.6			Apply appropriate techniques, tools, and formulas to determine measurement.		5, 6, 8
OCS.Math.2.6a			Use repetition of the same standard unit to measure something larger than the unit	C	
OCS.Math.2.6b			Recognize that different measuring systems will yield different numerical measurements of the same object	C	
OCS.Math.2.6c			Identify real world situations where estimated measurements of attributes are appropriate	C	
OCS.Math.2.7	2.MD.A		Measure and estimate lengths in standard units.		3, 5, 6, 8
OCS.Math.2.7a	2.MD.A.1		Measure the length of of an object by selecting and using appropriate tools	P	
OCS.Math.2.7b	2.MD.A.2	*	Measure the length of an object twice, using two different standards of measurement	P	
OCS.Math.2.7c	2.MD.A.2		Explain how two measurements relate to the size of the unit	C	
OCS.Math.2.7d	2.MD.A.3	*	Estimate lengths using units of inches, feet, yards, centimeters and meters	C	
OCS.Math.2.7e	2.MD.A.4		Measure to determine how much longer one object is than another	P	
OCS.Math.2.8	2.MD.B		Relate addition and subtraction to length.		1, 2, 5, 6
OCS.Math.2.8a	2.MD.B.5	*	Add and subtract within 100 to solve word problems involving lengths of the same units	P	
OCS.Math.2.8b	2.MD.B.6		Represent whole numbers up to 100 as lengths on a number line	C	
OCS.Math.2.9	2.MD.C		Tell and write time.		5, 6
OCS.Math.2.9a	2.MD.C.7	*	Tell and write time from analog and digital clocks to the nearest five minutes	P	
OCS.Math.2.9b	2.MD.C.7	*	Determine whether a given time is a.m. or p.m.	C	
OCS.Math.2.9c			Calculate time intervals to the nearest 30 minutes on an analog and digital clock	P	
OCS.Math.2.10	2.MD.C		Work with money.		1, 4, 5, 6
OCS.Math.2.10a	2.MD.C.8	*	Create and count coin combinations for values up to one dollar	C	
OCS.Math.2.10b		*	Identify different coin combinations for the same value	C	
OCS.Math.2.10c		*	Solve word problems with adding and subtracting within 100 cents	P	
OCS.Math.2.10d	2.MD.C.8	*	Use \$ and ¢ symbols appropriately	P	
OCS.Math.2.11	2.MD.D		Understand and apply the statistics process.		5, 6, 8
OCS.Math.2.11a		*	Identify questions that can be investigated by collecting data	C	
OCS.Math.2.11b	2.MD.D.10	*	Collect and record statistics (up to four categories) with bar graphs, pictographs, and tally charts	P	
OCS.Math.2.11c	2.MD.D.10	*	Interpret statistics (up to four categories) by solving simple word problems using bar graphs, pictographs, and tally charts	C	
OCS.Math.2.11d			Interpret statistics to predict probability	C	
OCS.Math.2.11e			Describe the likelihood of an event using mathematical language (impossible, unlikely, less likely, equally likely, more likely, certain, etc.)	C	
OCS.Math.2.11f			Compare the likelihood of events using mathematical language	C	

Archdiocese of Louisville Mathematics Standards

Grade Two

Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.2.11g			Describe probability in simple games and probability experiments	C	
OCS.Math.2	2.G	Geometry (G)			
OCS.Math.2.12	2.G.A	<i>Reason with shapes and their attributes.</i>			2, 5, 6, 7
OCS.Math.2.12a	2.G.A.1		Recognize and draw shapes having specified attributes, such as a given number of angles or sides	C	
OCS.Math.2.12b	2.G.A.1	*	Identify the number of sides and angles in two-dimensional shapes (quadrilaterals, triangles, pentagons, and hexagons)	P	
OCS.Math.2.12c		*	Identify the number of vertices, faces and edges of three-dimensional shapes (cubes, rectangular prisms, cones, cylinders, pyramids and spheres)	P	
OCS.Math.2.12d	2.G.A.2		Partition a rectangle into rows and columns of same-size squares and count to find the total number of them	P	
OCS.Math.2.12e	2.G.A.3	*	Partition circles and rectangles into halves, thirds, fourths, and eighths	P	
OCS.Math.2.12f	2.G.A.3		Recognize that equal shares of identical wholes need not have the same shape	C	
OCS.Math.2.12g		*	Identify symmetry and congruence of two-dimensional shapes	C	

Archdiocese of Louisville Mathematics Standards

Grade Three

Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.3	3.OA		Operations and Algebraic Thinking (OA)		
OCS.Math.3.1	3.OA.A		Represent and solve problems involving multiplication and division.		1, 2, 4, 6, 7
OCS.Math.3.1a	3.OA.A.1	*	Interpret and demonstrate products of whole numbers (for example, describe a context in which a total number of objects can be expressed as 5X7)	C	
OCS.Math.3.1a	3.OA.A.2		Interpret whole number quotients of whole numbers (for example, describe a context in which a number of shared or number of groups can be expressed as 56/8)	C	
OCS.Math.3.1b	3.OA.A.3	*	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities	P	
OCS.Math.3.1c	3.OA.A.4	*	Determine the unknown whole number in a multiplication or division equation relating three whole numbers	P	
OCS.Math.3.2	3.OA.B		Understand properties of multiplication and the relationship between multiplication and division.		2, 3, 4, 7
OCS.Math.3.2a	3.OA.B.5		Apply the commutative property of multiplication and division	C	
OCS.Math.3.2b	3.OA.B.5		Apply the associative property of multiplication and division	C	
OCS.Math.3.2c	3.OA.B.5		Apply the distributive property of multiplication and division	C	
OCS.Math.3.2d	3.OA.B.6	*	Recognize that the inverse of multiplication is division	P	
OCS.Math.3.3	3.OA.C		Multiply and divide within 100.		1, 2, 8
OCS.Math.3.3a	3.OA.C.7	*	Fluently find products of two numbers with factors up to ten	P	
OCS.Math.3.3b	3.OA.C.7	*	Fluently divide within 100	P	
OCS.Math.3.3c		*	Recognize that the whole number quotient is comprised of equal groups of the divisor	C	
OCS.Math.3.4	3.OA.D		Solve problems involving the four operations, and identify and explain patterns in arithmetic. (whole numbers/whole number answers)		1, 3, 4, 6, 8
OCS.Math.3.4a	3.OA.D.8	*	Solve problems using models, pictures, words and numbers	C	
OCS.Math.3.4b	3.OA.D.8		Use various strategies to solve complex, multi-step word problems	C	
OCS.Math.3.4c	3.OA.D.8	*	Apply estimation and rounding skills to determine reasonableness of answers	C	
OCS.Math.3.4d	3.OA.D.9		Identify arithmetic patterns and explain them using properties of operations	C	

Archdiocese of Louisville Mathematics Standards

Grade Three

Archloun Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.3	3.NBT		Number and Operations in Base Ten (NBT)		
OCS.Math.3.5	3.NBT.A		Use place value understanding and properties of operations to perform multi-digit arithmetic.		2, 3, 7, 8
OCS.Math.3.5a			Interpret multi-digit whole numbers using base-ten numerals, word form, and expanded form	P	
OCS.Math.3.5b	3.NBT.A.1	*	Round whole numbers up to the hundred thousands to the nearest 10, 100, or 1,000	P	
OCS.Math.3.5c		*	Order and compare whole numbers up to the hundred thousands using <, >, or =	P	
OCS.Math.3.5d	3.NBT.A.2	*	Fluently add and subtract whole numbers with three digits (with and without regrouping) using strategies and algorithms	P	
OCS.Math.3.5e	3.NBT.A.2		Apply commutative, associative, and distributive properties as strategies to add and subtract	C	
OCS.Math.3.5f	3.NBT.A.3	*	Multiply one-digit numbers by a multiple of ten	P	
OCS.Math.3.5g			Read and write decimals to the tenths and hundredths place using base ten numerals and number names	C	
OCS.Math.3.5h			Fluently add and subtract decimals with money	P	
OCS.Math.3	3.NF		Number and Operations - Fractions (NF)		
OCS.Math.3.6	3.NF.A		Develop understanding of fractions as numbers. (Grade three expectations in this domain are limited to fractions with denominators 2, 3, 4, 6, and 8.)		2, 3, 4, 7
OCS.Math.3.6a	3.NF.A.1	*	Understand a fraction as a quantity formed when a whole is divided into equal parts	C	
OCS.Math.3.6b	3.NF.A.2		Represent fractions on a number line diagram	P	
OCS.Math.3.6c	3.NF.A.2.A		Recognize a unit fraction as 1/b on a number line where the interval between 0 and 1 has been divided into b equal parts	C	
OCS.Math.3.6d	3.NF.A.3.A	*	Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line	C	
OCS.Math.3.6e	3.NF.A.3.B		Generate simple equivalent fractions through illustrations	C	
OCS.Math.3.6f	3.NF.A.3.C	*	Express whole numbers as fractions and recognize fractions that are equivalent to whole numbers	C	
OCS.Math.3.6g	3.NF.A.3.D		Compare two fractions with the same numerator or the same denominator by reasoning about their size with the symbols >, <, or =	P	
OCS.Math.3.6h		*	Use models to add and subtract fractions with common denominators	C	

Archdiocese of Louisville Mathematics Standards

Grade Three

Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.3	3.MD		Measurement and Data (MD)		
OCS.Math.3.7	3.MD.A		<i>Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects.</i>		1, 4, 5, 6
OCS.Math.3.7a	3.MD.A.1	*	Tell and write time to the nearest minute using analog and digital clocks	P	
OCS.Math.3.7b	3.MD.A.1		Measure elapsed time across the hour and minutes	P	
OCS.Math.3.7c			Measure length using customary and metric linear units to the nearest inch, half-inch, and quarter-inch or whole centimeter	P	
OCS.Math.3.7d	3.MD.A.2	*	Measure and estimate masses and liquid volumes of objects using standard units of grams (g), kilograms (kg) and liters (L)	C	
OCS.Math.3.7e		*	Measure and estimate masses and liquid volumes of objects using standard units of cups, pints, quarts, and gallons	C	
OCS.Math.3.7f	3.MD.A.2		Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units	P	
OCS.Math.3.8	3.MD.B		<i>Understand and apply the statistics process.</i>		1, 3, 5, 6
OCS.Math.3.8a		*	Identify a statistical question focused on categorical data and gather data	C	
OCS.Math.3.8b	3.MD.B.3	*	Create a scaled pictograph and a scaled bar graph to represent a data set (using technology or by hand)	P	
OCS.Math.3.8c	3.MD.B.3	*	Make observations from the graph about the question posed, including "how many more" and "how many less" questions	C	
OCS.Math.3.8d		*	Investigate a statistical question focused on numerical data	C	
OCS.Math.3.8e	3.MD.B.4		Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch	P	
OCS.Math.3.8f	3.MD.B.4		Show measurement data by making a line plot where the horizontal scale is marked off in appropriate units- whole numbers, halves, or quarters	P	
OCS.Math.3.8g			Make observations from the graph about the question posed, including questions about the shape of data and compare responses	C	
OCS.Math.3.8h			Describe the likelihood of an event using mathematical language (impossible, unlikely, less likely, equally likely, more likely, certain, etc.)	C	
OCS.Math.3.8i			Compare the likelihood of events using mathematical language	C	
OCS.Math.3.8j			Predict the frequency of an outcome in simple games or probability experiments	C	

Archdiocese of Louisville Mathematics Standards

Grade Three

Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.3	3.MD		Measurement and Data (MD)		
OCS.Math.3.9	3.MD.C		<i>Geometric measurement: understand concepts of area and relate area to multiplication and to addition.</i>		1, 5, 6, 8
OCS.Math.3.9a	3.MD.C.5	*	Recognize area as an attribute of plane figures	C	
OCS.Math.3.9b	3.MD.C.6	*	Measure area by counting unit squares	P	
OCS.Math.3.9c	3.MD.C.7	*	Relate area to the operations of multiplication and addition	C	
OCS.Math.3.9d	3.MD.C.7.A	*	Find the area of a rectangle with whole-number side lengths by tiling it and show the area is the same as would be found by multiplying the side lengths	P	
OCS.Math.3.9e	3.MD.C.7.B		Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems	P	
OCS.Math.3.9f	3.MD.C.7.D		Recognize area as an additive. Find areas of figures that can be decomposed into non-overlapping rectangles by adding the areas of the non-overlapping parts, applying this technique to solve real world problems	C	
OCS.Math.3.10	3.MD.D		<i>Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.</i>		1, 4, 7
OCS.Math.3.10a	3.MD.D.8		Find the perimeter given the side lengths of a polygon	P	
OCS.Math.3.10b	3.MD.D.8	*	Find an unknown side length, given the perimeter and some lengths	C	
OCS.Math.3.10c	3.MD.D.8		Solve real world and mathematical problems involving perimeters of polygons	C	
OCS.Math.3.10d	3.MD.D.8		Draw rectangles with the same perimeter and different areas or with the same area and different perimeters	C	
OCS.Math.3	3.G		Geometry (G)		
OCS.Math.3.11	3.G.A		<i>Reason with shapes and their attributes.</i>		2, 5, 6, 7
OCS.Math.3.11a		*	Recognize and classify polygons based on the number of sides, vertices and angles (triangles, quadrilaterals, pentagons, and hexagons	P	
OCS.Math.3.11b	3.G.A.1		Recognize and classify quadrilaterals (rectangles, squares, parallelograms, rhombuses, trapezoids) by side lengths and understanding shapes in different categories may share attributes and the shared attributes can define a larger category	C	
OCS.Math.3.11c	3.G.A.2		Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole.	C	
OCS.Math.3.11d			Identify and draw lines of symmetry	P	

Archdiocese of Louisville Mathematics Standards

Grade Four

Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.4	4.OA		Operations and Algebraic Thinking (OA)		
OCS.Math.4.1	4.OA.A		Use the four operations with whole numbers to solve problems.		1, 2, 4
OCS.Math.4.1a	4.OA.A.1	*	Interpret and express a multiplication equation as a comparison	C	
OCS.Math.4.1b	4.OA.A.2		Multiply or divide to solve multiplicative comparison word problems using drawings and equations with symbols for the unknown	P	
OCS.Math.4.1c	4.OA.A.2		Distinguish between multiplicative comparison and additive comparison	C	
OCS.Math.4.1d	4.OA.A.3	*	Solve equations with a letter standing for the unknown quantity to represent multi step word problems	P	
OCS.Math.4.1e	4.OA.A.3	*	Solve multistep word problems	P	
OCS.Math.4.1f	4.OA.A.3	*	Assess the reasonableness of an answer to multistep word problems using estimation, rounding skills and mental computation	C	
OCS.Math.4.2	4.OA.B		Gain familiarity with factors and multiples.		5, 7
OCS.Math.4.2a	4.OA.B.4	*	Find factor pairs for whole numbers	P	
OCS.Math.4.2b	4.OA.B.4		Recognize that a whole number is a multiple of each of its factors	C	
OCS.Math.4.2c	4.OA.B.4		Determine whether a number is a multiple of a given one digit number	P	
OCS.Math.4.2d	4.OA.B.4	*	Determine whether a number is prime or composite	P	
OCS.Math.4.3	4.OA.C		Generate and analyze patterns.		2, 3
OCS.Math.4.3a	4.OA.C.5	*	Generate patterns that follow a given rule	C	
OCS.Math.4.3b		*	Determine the rule of a given pattern	C	

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Grade Four

Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.4	4.NBT		Number and Operations in Base Ten (NBT)		
OCS.Math.4.4	4.NBT.A		<i>Generalize place value understanding for multi-digit whole numbers.</i>		2, 6, 7
OCS.Math.4.4a	4.NBT.A.1	*	Recognize the relationship of same digits located in different places in a whole number	C	
OCS.Math.4.4b	4.NBT.A.2	*	Identify and write multi-digit whole numbers using base-ten numerals, word form and expanded form	P	
OCS.Math.4.4c	4.NBT.A.3	*	Round multi-digit whole numbers to any place value	P	
OCS.Math.4.5	4.NBT.B		<i>Use place value understanding and properties of operations to perform multi-digit arithmetic.</i>		3, 7, 8
OCS.Math.4.5a	4.NBT.B.4	*	Fluently add and subtract multi-digit whole numbers	P	
OCS.Math.4.5b	4.NBT.B.5	*	Apply properties of operations to multiplication and division	P	
OCS.Math.4.5c	4.NBT.B.5	*	Use and explain a variety of strategies to multiply up to four digits by one digit	P	
OCS.Math.4.5d	4.NBT.B.5		Use and explain a variety of strategies to multiply two digits by two digits	C	
OCS.Math.4.5e	4.NBT.B.6	*	Use and explain a variety of strategies to find whole number quotients and remainders with up to four digit dividends with one digit divisors	C	
OCS.Math.4.5f	4.NBT.B.6		Interpret a remainder as a fraction that represents part of the next whole	C	

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Grade Four

Archloun Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.4	4.NF		Number and Operations - Fractions (NF)		
OCS.Math.4.6	4.NF.A		Extend understanding of fraction equivalence and ordering.		2, 4, 8
OCS.Math.4.6a	4.NF.A.1	*	Use visual models to describe the relationship between two equivalent fractions	C	
OCS.Math.4.6b	4.NF.A.1	*	Generate an equivalent fraction by multiplying the numerator and denominator by the same number	P	
OCS.Math.4.6c	4.NF.A.2	*	Compare two fractions with different numerators and denominators using <, > and =	P	
OCS.Math.4.6d	4.NF.A.2	*	Recognize that the magnitude of a fraction or decimal is determined by the size of the whole to which it refers	C	
OCS.Math.4.7	4.NF.B		Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.		1, 5, 7
OCS.Math.4.7a	4.NF.B.3.A	*	Understand addition and subtraction of fractions as joining and separating parts referring to the same whole	C	
OCS.Math.4.7b	4.NF.B.3.C	*	Add fractions with common denominators	P	
OCS.Math.4.7c	4.NF.B.3.C	*	Subtract fractions with common denominators	P	
OCS.Math.4.7d	4.NF.B.3.B		Decompose a fraction into a sum of fractions with the same denominator	C	
OCS.Math.4.7e	4.NF.B.4.A		Demonstrate that a fraction a/b is a multiple of 1/b	C	
OCS.Math.4.7f	4.NF.B.3.C		Add and subtract mixed numbers with like denominators	P	
OCS.Math.4.7g	4.NF.B.3.D		Solve word problems involving addition and subtraction of fractions with common denominators	C	
OCS.Math.4.7h	4.NF.B.4	*	Multiply a fraction by a whole number	C	
OCS.Math.4.7i	4.NF.B.4.C		Solve word problems involving multiplication of a fraction by a whole number	C	
OCS.Math.4.8	4.NF.C		Understand decimal notation for fractions, and compare decimal fractions.		3, 5, 7
OCS.Math.4.8a	4.NF.C.6	*	Explain the relationship between fractions decimals and percents	C	
OCS.Math.4.8b	4.NF.C.5	*	Translate fractions with denominators 10 or 100 into decimals	P	
OCS.Math.4.8c	4.NF.C.7		Compare two decimals to the hundredth place by reasoning about their size	C	
OCS.Math.4.8d	4.NF.3.d		Compare two decimals to the hundredth place using <, > and =	P	
OCS.Math.4.8e		*	Add decimals	P	
OCS.Math.4.8f		*	Subtract decimals	P	

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Archloun Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.4	4.MD		Measurement and Data (MD)		
OCS.Math.4.9	4.MD.A		<i>Solve problems involving measurement and conversion of measurements.</i>		1, 4, 6
OCS.Math.4.9a	4.MD.A.1	*	Know relative size of standard measurement units in customary and metric systems (mass, weight, liquid, volume, length, time)	C	
OCS.Math.4.9b		*	Describe relationship of measurement units within US customary system and metric system	C	
OCS.Math.4.9c	4.MD.A.1		Record measurement equivalents in table	P	
OCS.Math.4.9d	4.MD.A.2		Use the four operations to solve measurement word problems involving simple fractions	P	
OCS.Math.4.9e	4.MD.A.2		Use the four operations to solve measurement word problems involving decimals	P	
OCS.Math.4.9f	4.MD.A.2		Use the four operations to solve measurement word problems involving conversions from larger units to smaller units	C	
OCS.Math.4.9g	4.MD.A.2		Use a diagram to represent measurement quantities to solve word problems	C	
OCS.Math.4.9h	4.MD.A.3	*	Apply the area formula for rectangles in real world and mathematical problems	C	
OCS.Math.4.9i	4.MD.A.3	*	Apply the perimeter formula for rectangles in the real world and mathematical problems	C	
OCS.Math.4.10			<i>Understand and apply the statistics process.</i>		1, 6
OCS.Math.4.10a			Generate and design an investigation for a statistical question based on numerical data	C	
OCS.Math.4.10b	4.MD.B.4		Make a line plot to display a data set of measurement in fractions of a unit	P	
OCS.Math.4.10c	4.MD.B.4		Use data from line plot to solve problems involving addition and subtraction of fractions	C	
OCS.Math.4.10d			Predict the frequency of an outcome in a simple probability experiment	C	
OCS.Math.4.10e			Determine how the number of repetitions of a probability experiment can affect conclusions drawn	C	
OCS.Math.4.11	4.MD.C		<i>Geometric measurement: understand concepts of angle and measure angles.</i>		1, 5, 6, 7
OCS.Math.4.11a	4.MD.C.5.A	*	Show that an angle is measured with reference to a circle with the intersection of the rays at the center of the circle	C	
OCS.Math.4.11b	4.MD.C.6	*	Measure and sketch angles in whole number degrees using protractors	P	
OCS.Math.4.11c	4.MD.C.5.A		Recognize that a 1 degree angle is 1/360 of a circle	C	
OCS.Math.4.11d	4.MD.C.7		Show that angle measure is additive	C	
OCS.Math.4.11e	4.MD.C.7	*	Solve addition and subtraction problems to find the value of unknown angles on a diagram in real world and mathematical problems	C	

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Grade Four

Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.4	4.G		Geometry (G)		
OCS.Math.4.12	4.G.A		<i>Draw and identify lines and angles, and classify shapes by properties of their lines and angles.</i>		5, 6, 7
OCS.Math.4.12a	4.G.A.1	*	Define and draw point, lines, line segments, rays, angles, perpendicular lines and parallel lines	P	
OCS.Math.4.12b	4.G.A.1	*	Identify right, acute, obtuse angle, parallel and perpendicular lines in two dimensional figures	C	
OCS.Math.4.12c	4.G.A.2		Classify two dimensional figures based on the presence or absence of parallel or perpendicular lines	C	
OCS.Math.4.12d	4.G.A.2		Classify two dimensional figures based on the presence or absence of angles of a specified size	C	
OCS.Math.4.12e		*	Identify the attributes of a right triangle	C	

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Grade Five

Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.5	5.OA		Operations and Algebraic Thinking (OA)		
OCS.Math.5.1	5.OA.A		<i>Write and interpret numerical expressions and equations.</i>		1, 2, 3, 7
OCS.Math.5.1a		*	Differentiate between numeric and algebraic expressions and equations	C	
OCS.Math.5.1b	5.OA.A.1		Evaluate numerical expressions that use parentheses, brackets, or braces	P	
OCS.Math.5.1c	5.OA.A.1		Evaluate expressions that include variables for the unknown quantity	P	
OCS.Math.5.1d	5.OA.A.2		Write, interpret and evaluate numerical and algebraic expressions and equations	P	
OCS.Math.5.1e			Write and interpret numerical/algebraic expressions and equations from word problems	P	
OCS.Math.5.2	5.OA.B		<i>Analyze patterns and relationships.</i>		2, 4
OCS.Math.5.2a	5.OA.B.3	*	Generate a rule for growing patterns, identifying the relationship between corresponding terms (x,y)	C	
OCS.Math.5.2b	5.OA.B.3	*	Generate numerical patterns using one or two given rules (x,y)	C	
OCS.Math.5.2c	5.OA.B.3	*	Use tables, ordered pairs and graphs to represent the relationship between corresponding terms	P	
OCS.Math.5.2d	5.OA.B.3	*	Define the application of ordered pairs to a coordinate plane	P	

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Grade Five

Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.5.3	5.NBT		Number and Operations in Base Ten (NBT)		
OCS.Math.5.3a	5.NBT.A		Understand the place value system.		2, 3, 5, 7, 8
OCS.Math.5.3b	5.NBT.A.1		Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left	C	
OCS.Math.5.3c	5.NBT.A.2	*	Explain patterns in the number of zeros of the product when multiplying a number by powers of 10	C	
OCS.Math.5.3d	5.NBT.A.2		Explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10	C	
OCS.Math.5.3e	5.NBT.A.2		Use whole-number exponents to denote powers of 10	P	
OCS.Math.5.3f	5.NBT.A.3.A	*	Read and write decimals to the <i>ten</i> -thousandths place using base-ten numerals, number names, and expanded form	P	
OCS.Math.5.3g	5.NBT.A.3.B	*	Compare and order decimals to the <i>ten</i> -thousandths place using >, <, or = symbols	P	
OCS.Math.5.3h	5.NBT.A.4	*	Round decimals to the indicated place value position	P	
OCS.Math.5.4	5.NBT.B		Perform operations with multi-digit whole numbers and decimals to hundredths.		3, 4, 6, 7
OCS.Math.5.4a	5.NBT.B.5	*	Fluently multiply multi-digit whole numbers using the standard algorithm	P	
OCS.Math.5.4b	5.NBT.B.6	*	Fluently divide up to four-digit dividends by two-digit divisors using strategies based on place value, the properties of operations and/or the relationship between multiplication and division	P	
OCS.Math.5.4c		*	Recognize the percent and decimal value of benchmark fractions	C	
OCS.Math.5.4d	5.NBT.B.6	*	Illustrate and explain division by using equations, rectangular arrays, and/or area models	P	
OCS.Math.5.4e		*	Report and explain remainders as fractions and decimals	P	
OCS.Math.5.4f			Interpret remainders in problem solving	C	
OCS.Math.5.4g			Estimate quotients using compatible numbers	C	
OCS.Math.5.4h			Apply divisibility rules for 2, 3, 4, 5, 6, 9, 10	P	
OCS.Math.5.4i		*	Recognize and interpret the greatest common factor (GCF) and least common multiple (LCM)	P	
OCS.Math.5.4j	5.NBT.B.7	*	Add and subtract decimals to the hundredths using concrete models or drawing, strategies based on place value, properties of operations, the relationship between addition and subtraction	P	
OCS.Math.5.4k	5.NBT.B.7	*	Multiply decimals to the hundredths using concrete models or drawing, strategies based on place value, properties of operations, the relationship between addition and subtraction	P	
OCS.Math.5.4l	5.NBT.B.7	*	Explain the reasoning for using concrete models, drawing, strategies based on place value, properties of operations, and/or the relationship between addition and subtraction for decimal computation	C	

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Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.5	5.NF		Number and Operations - Fractions (NF)		
OCS.Math.5.5	5.NF.A		Use equivalent fractions as a strategy to add and subtract fractions.		1, 2, 3, 4
OCS.Math.5.5a	5.NF.A.1	*	Add and subtract fractions with unlike denominators including mixed numbers by replacing given fractions with equivalent fractions	P	
OCS.Math.5.5b	5.NF.A.2		Solve word problems involving addition and subtraction of fractions including cases of unlike denominators using visual models or equations to represent the problem	C	
OCS.Math.5.5c	5.NF.A.2	*	Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers	C	
OCS.Math.5.5d			Apply greatest common factor (GCF) to express sums and differences in simplest forms	P	
OCS.Math.5.6	5.NF.B		Apply and extend previous understandings of multiplication and division		1, 4, 6, 8
OCS.Math.5.6a	5.NF.B.4.A	*	Interpret a fraction as division of the numerator by the denominator	C	
OCS.Math.5.6b	5.NF.B.3	*	Solve word problems involving division of whole number leading to answers in the form of fractions or mixed numbers	P	
OCS.Math.5.6c	5.NF.B.4.A		Apply and extend previous understanding of multiplication to multiply a fraction or whole number by a fraction	C	
OCS.Math.5.6d			Fluently multiply a fraction by a whole number	P	
OCS.Math.5.6e		*	Express fractions greater than one as mixed numbers	P	
OCS.Math.5.6f	5.NF.B.5		Interpret multiplication as scaling (resizing)	C	
OCS.Math.5.6g	5.NF.B.5.A		Compare the size of a product to the size of one factor on the basis of the size of the other factor		
OCS.Math.5.6h	5.NF.B.5.B		Use scaling or resizing to explain why multiplying a given number by an improper fraction results in a product greater than the given number	C	
OCS.Math.5.6i	5.NF.B.5.B		Use scaling or resizing to explain why multiplying a given number by a proper fraction results in a product smaller than the given number	C	
OCS.Math.5.6j	5.NF.B.6	*	Solve real world problems involving fractions and mixed numbers using visual models and equations	C	
OCS.Math.5.6k	5.NF.B.7	*	Compute quotients by dividing unit fractions by whole numbers	P	
OCS.Math.5.6l	5.NF.B.7	*	Compute quotients by dividing whole numbers by unit fractions	P	
OCS.Math.5.6m	5.NF.B.7.A		Interpret division of a unit fraction by a whole number, and compute such quotients	C	
OCS.Math.5.6n	5.NF.B.7.B		Interpret division of a whole number by a unit fraction, and compute such quotients	C	
OCS.Math.5.6o	5.NF.B.7.C		Solve real world problems involving division of unit fractions by whole numbers	C	
OCS.Math.5.6p	5.NF.B.7.C		Solve real world problems involving division of whole numbers by unit fractions	C	

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Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.5	5.MD		Measurement and Data (MD)		
OCS.Math.5.7	5.MD.A		Convert like measurement units within a given measurement system.		3, 5, 8
OCS.Math.5.7a	5.MD.A.1	*	Convert among different size measurement units (mass, weight, liquid volume, length, time) within one system of units (metric system, customary, and time).	C	
OCS.Math.5.7b	5.MD.A.1		Solve multi-step real world problems by converting different size standard measurement units within a given measurement system.	C	
OCS.Math.5.8			Understand and apply the statistics process.		4, 5, 6
OCS.Math.5.8a		*	Identify, gather and display fractional data in an appropriate graph for statistical questions focused on both categorical and numerical data.	P	
OCS.Math.5.8b	5.MD.B.2		Interpret data displayed on a variety of graphs (bar graph, pictograph, line plot, stem and leaf plots)	C	
OCS.Math.5.8c			Make observations from a graph related to a question posed	C	
OCS.Math.5.8d			Calculate and apply range, median, mode, and mean with whole numbers	P	
OCS.Math.5.8e			Determine and represent all the possible outcomes in a simple probability experiment	C	
OCS.Math.5.8f			Represent, using a common fraction, the probability that an event will occur in simple games and experiments	P	
OCS.Math.5.8g			Pose and solve simple probability problems	C	
OCS.Math.5.9	5.MD.C		Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.		4, 5, 6, 8
OCS.Math.5.9a	5.MD.C.3	*	Recognize volume as an attribute of solid figures and understand concepts of volume measurement	C	
OCS.Math.5.9b	5.MD.C.3.A	*	Define a cubic unit as a cube with all side lengths of 1 unit and a volume of 1 unit cubed (cubic cm, cubic in, cubic feet)	C	
OCS.Math.5.9c	5.MD.C.3.B		Measure and express the volume of a solid figure by packing it without gaps with unit cubes (cubic cm, cubic in, cubic ft, and improvised units)		
OCS.Math.5.9d	5.MD.C.5		Relate volume to the operations of multiplication and repeated addition and solve real world and mathematical problems involving volume.	C	
OCS.Math.5.9e	5.MD.C.5.A		Find the volume of a right rectangular prism with whole number side lengths by packing it with unit cubes, and relate the volume to that which would be calculated by multiplying the edge lengths	P	
OCS.Math.5.9f	5.MD.C.5.B	*	Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.	P	
OCS.Math.5.9g	5.MD.C.5.C		Solve real world problems to find the volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-over-lapping parts	C	

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Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.5	5.G		Geometry (G)		
OCS.Math.5.10	5.G.A		<i>Graph points on the coordinate plane to solve real-world and mathematical problems.</i>		1, 4, 6, 7
OCS.Math.5.10a	5.G.A.1	*	Identify the parts of a coordinate plane including origin, x axis and y axis	P	
OCS.Math.5.10b	5.G.A.1	*	Locate and describe how to find a point in quadrant one of the coordinate plane using an ordered pair of numbers	P	
OCS.Math.5.10c	5.G.A.2		Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane and interpret coordinate values of points in the context of the situation	C	
OCS.Math.5.11	5.G.B		<i>Classify two and three dimensional figures into categories based on their properties.</i>		1, 3, 6, 7
OCS.Math.5.11a			Identify the following attributes: sides, vertices, faces, edges, and angles (obtuse, acute, right, or straight)	C	
OCS.Math.5.11b	5.G.B.3		Compare and understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category	C	
OCS.Math.5.11c	5.G.B.4	*	Classify two-dimensional figures into hierarchy based on their properties	C	
OCS.Math.5.11d		*	Classify three-dimensional figures including cubes, prisms, pyramids, cones, and spheres	C	

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Grade Six

Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.6	6.RP		Ratios and Proportional Relationships (RP)		
OCS.Math.6.1	6.RP.A		Understand ratio concepts and use ratio reasoning to solve problems.		1, 4, 7, 8
OCS.Math.6.1a	6.RP.A.1	*	Describe a ratio relationship between two quantities using ratio language (for every, per time, as many)	C	
OCS.Math.6.1b	6.RP.A.2		Understand the concept of a unit rate a/b associated with a ratio a:b with b ≠ 0	C	
OCS.Math.6.1c	6.RP.A.2	*	Use rate language in the context of a ratio relationship	C	
OCS.Math.6.1d	6.RP.A.3 6.RP.A.3.B		Use ratio and rate reasoning to solve real world problems including those involving unit pricing and constant	P	
OCS.Math.6.1e	6.RP.A.3.A	*	Compare equivalent ratios	C	
OCS.Math.6.1f	6.RP.A.3.A	*	Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables	P	
OCS.Math.6.1g	6.RP.A.3.A	*	Use tables to compare ratios	C	
OCS.Math.6.1h	6.RP.A.3.C		Find a percent of a quantity as a rate per 100	P	
OCS.Math.6.1i	6.RP.A.3.C		Solve problems by finding the whole, given a part and a percent	C	
OCS.Math.6.1j	6.RP.A.3.D	*	Convert measurement units using ratio reasoning	C	
OCS.Math.6.1k			Distiguish porportional relationships from additive relationships	C	
OCS.Math.6	6.NS		The Number System (NS)		
OCS.Math.6.2	6.NS.A		Apply and extend previous understandings of multiplication and division to divide fractions by fractions.		1, 4, 6, 7
OCS.Math.6.2a		*	Interpret and compute products of fractions and mixed numbers	C/P	
OCS.Math.6.2b	6.NS.A.1	*	Interpret and compute quotients of fractions and mixed numbers	C/P	
OCS.Math.6.2c	6.NS.A.1	*	Solve word problems involving multiplication and division of fractions including improper fractions using visual models	C	
OCS.Math.6.3	6.NS.B		Multiply and divide multi-digit numbers and find common factors and multiples.		1, 6, 8
OCS.Math.6.3a	6.NS.B.2	*	Fluently divide multi-digit numbers using an algorithm	P	
OCS.Math.6.3b		*	Convert a rational number to a decimal using long division	P	
OCS.Math.6.3c			Explain that the decimal form of a rational number terminates in zeros or eventually repeats	C	
OCS.Math.6.3d	6.NS.B.3	*	Fluently add, subtract, multiply, and divide multi-digit decimals using an algorithm for each operation	P	
OCS.Math.6.3e	6.NS.B.4		Use the distributive property to find equivalent expressions	P	
OCS.Math.6.3f	6.NS.B.4	*	Using prime factorization, find the greatest common factor and least common multiple of two or more whole numbers	P	

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Grade Six

Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.6	6.NS		The Number System (NS)		
OCS.Math.6.4	6.NS.C		<i>Apply and extend previous understandings of numbers to the system of rational numbers.</i>		1, 2, 4
OCS.Math.6.4a	6.NS.C.5	*	Show that positive and negative numbers are used together to describe quantities having opposite directions or values	C	
OCS.Math.6.4b	6.NS.C.5	*	Use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation	C	
OCS.Math.6.4c	6.NS.C.6	*	Extend number line diagrams and coordinate axes to include negative numbers and coordinates	C	
OCS.Math.6.4d	6.NS.C.6.A	*	Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line	C	
OCS.Math.6.4e	6.NS.C.6.A		Recognize 0 is its own opposite, the opposite of a negative number is a positive and the opposite of a positive number is a negative	C	
OCS.Math.6.4f	6.NS.C.6.B	*	Find and position integers and other rational numbers on a horizontal or vertical number line diagram	P	
OCS.Math.6.4g	6.NS.C.6.B		Find and position pairs of integers and other rational numbers on a coordinate plane	P	
OCS.Math.6.4h	6.NS.C.6.B		Use the signs of numbers in ordered pairs to locate points in all quadrants of the coordinate plane	P	
OCS.Math.6.4i	6.NS.C.7.C	*	Interpret the absolute value of a rational number as its distance from 0 on the number line	C	
OCS.Math.6.4j	6.NS.C.7	*	Compare and order values (integers, rational numbers, and absolute value) on an number line	C	
OCS.Math.6.4k	6.NS.C.7.B		Order, interpret and explain rational numbers in real-world contexts	C	
OCS.Math.6.4l	6.NS.C.7.C		Interpret absolute value in real-world situations	C	
OCS.Math.6.4m	6.NS.C.7.D		Distiguise comparisons of absolute value from statements about order	C	
OCS.Math.6.4n	6.NS.C.8		Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane	C	
OCS.Math.6.4o	6.NS.C.8		Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate	C	
OCS.Math.6.4p			Add, subtract, multiply and divide integers	P	

Archdiocese of Louisville Mathematics Standards

Grade Six

Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.6	6.EE		Expressions and Equations (EE)		
OCS.Math.6.5	6.EE.1		<i>Apply and extend previous understandings of arithmetic to algebraic expressions.</i>		1, 2
OCS.Math.6.5a	6.EE.A.1	*	Write numerical expressions involving whole-number exponents	P	
OCS.Math.6.5b	6.EE.A.1	*	Evaluate numerical expressions involving whole-number exponents	P	
OCS.Math.6.5c	6.EE.A.2.A		Write expressions that record operations with numbers and with letters standing for numbers (variables)	C	
OCS.Math.6.5d	6.EE.A.2.C	*	Apply order of operations to evaluate an expression involving positive whole numbers	P	
OCS.Math.6.5e	6.EE.A.2.B		Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient)	P	
OCS.Math.6.5f	6.EE.A.3		Apply the properties of operations (associative, commutative, and distributive) to generate equivalent expressions	C	
OCS.Math.6.5g	6.EE.A.4		Determine the equivalency of two expressions	C	
OCS.Math.6.6	6.EE.B		<i>Reason about and solve one-variable equations and inequalities.</i>		2, 4, 5
OCS.Math.6.6a	6.EE.B.5		Determine the set of values that make an equation or inequality true	C	
OCS.Math.6.6b	6.EE.B.5		Use substitution to determine whether a given number in a specified set makes an equation or inequality true	P	
OCS.Math.6.6c	6.EE.B.7		Solve real-world or mathematical problems by writing expressions with variables representing numbers	C	
OCS.Math.6.6d			Solve real-world and mathematical problems by writing and solving addition and multiplication equations	C	
OCS.Math.6.6e	6.EE.B.8		Write an inequality of the form $x > c$, $x < c$, $x \geq c$, and $x \leq c$ to represent a constraint or condition in a real-world or mathematical problem	C	
OCS.Math.6.6f	6.EE.B.8		Show that inequalities of these forms $x > c$, $x < c$, $x \geq c$, and $x \leq c$ have infinitely many solutions	C	
OCS.Math.6.6g	6.EE.B.8		Represent solutions of inequalities $x > c$, $x < c$, $x \geq c$, and $x \leq c$ on number line diagrams	P	
OCS.Math.6.7	6.EE.C		<i>Represent and analyze quantitative relationships between dependent and independent variables.</i>		2, 3, 5, 7
OCS.Math.6.7a	6.EE.C.9		Solve real-world problems that use variables to represent two quantities that change in relationship to one another	C	
OCS.Math.6.7b	6.EE.C.9		Write an equation that expresses one quantity as the independent variable and the second quantity as the dependent variable	C	
OCS.Math.6.7c	6.EE.C.9		Analyze the relationship between the dependent and independent variables using graphs and tables	C	
OCS.Math.6.7d	6.EE.C.9		Relate graphs and tables to a written equation that expresses one quantity as the independent variable and the second quantity as the dependent variable	C	

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Grade Six

Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.6	6.G		Geometry (G)		
OCS.Math.6.8	6.G.A		<i>Solve real-world and mathematical problems involving area, surface area, and volume.</i>		2, 3
OCS.Math.6.8a	6.G.A.1	*	Find the area of right triangles and other triangles by composing into rectangles	C	
OCS.Math.6.8b	6.G.A.1		Find the area of special quadrilaterals and polygons by composing into rectangles or decomposing into triangles and quadrilaterals	C	
OCS.Math.6.8c	6.G.A.1	*	Solve real world problems by finding the area of right triangles and other triangles	C	
OCS.Math.6.8d	6.G.A.1		Solve real world problems by finding the area of special quadrilaterals and polygons by composing into rectangles or decomposing into triangles and quadrilaterals	C	
OCS.Math.6.8e	6.G.A.2	*	Find the volume of a right rectangular prism with rational number edge lengths	P	
OCS.Math.6.8f	6.G.A.2	*	Solve real world and mathematical problems by applying the formulas $V=lwh$ and $V=bh$ to find volumes of right rectangular prisms with rational number edge lengths	C	
OCS.Math.6.8g	6.G.A.3	*	Draw polygons in the coordinate plane given coordinates for the vertices	P	
OCS.Math.6.8h	6.G.A.3		Use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate	P	
OCS.Math.6.8i	6.G.A.4		Solve real-world problems by drawing polygons in the coordinate plane and finding the length of a side joining points with the same first or same second coordinate	C	

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Grade Six

Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.6	6.SP		Statistics and Probability (SP)		
OCS.Math.6.9	6.SP.A		Develop understanding of statistical reasoning and variability.		5, 6, 7
OCS.Math.6.9a	6.SP.A.1		Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers	C	
OCS.Math.6.9b	6.SP.A.2		Understand that a set of numerical data collected to answer a statistical question has a distribution which can be described by its center, spread, and overall shape	C	
OCS.Math.6.9c		*	Locate a measure of center for a numerical data set	P	
OCS.Math.6.9d		*	Locate a measure of variation for a numerical data set	P	
OCS.Math.6.9e	6.SP.A.3		Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number	C	
OCS.Math.6.10	6.SP.B		Summarize and describe distributions.		2, 3, 4, 7
OCS.Math.6.10a	6.SP.B.4	*	Display the distribution of numerical data in plots on a number line, including dot plots, histograms, and box plots	P	
OCS.Math.6.10b	6.SP.B.5.A		Summarize numerical data sets in relation to their context by reporting the number of observations	P	
OCS.Math.6.10c	6.SP.B.5.B		Summarize numerical data sets in relation to their context by describing how it was measured and its units of measurement	P	
OCS.Math.6.10d	6.SP.B.5.C		Summarize numerical data sets in relation to their context by using quantitative measures of central tendency	P	
OCS.Math.6.10e	6.SP.B.5.C		Summarize numerical data sets in relation to their context by using quantitative measures of variability	P	
OCS.Math.6.10f	6.SP.B.5.C		Summarize numerical data sets in relation to their context by describing overall patterns and deviations from the overall patterns with reference to the context in which the data were gathered	C	
OCS.Math.6.10g	6.SP.B.5.D		Summarize numerical data sets in relation to their context by relating measures of central tendency and variability to the shape of the data distribution in the context in which the data were gathered	C	
OCS.Math.6.11			Determine the theoretical probability of an outcome in a probability experiment		2, 3, 8
OCS.Math.6.11a			Express theoretical probability as a ratio of the number of favorable outcomes to the total number of possible outcomes	P	
OCS.Math.6.11b			Represent the probability of an event using a value from the range of 0 (never happens or impossible) to 1 (always happens or certain)	C	
OCS.Math.6.11c			Predict the frequency of an outcome of a simple probability experiment or game, by calculating and using the theoretical probability of that outcome	C	

Archdiocese of Louisville Mathematics Standards					
Grade Seven					
Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.7	7.RP		Ratios and Proportional Relationships (RP)		
OCS.Math.7.1	7.RP.A		Analyze proportional relationships and use them to solve real-world and mathematical problems.		1, 2, 3, 5, 6
OCS. Math.7.1a	7.RP.A.2	*	Recognize and represent proportional relationships between two quantities	C	
OCS. Math.7.1b	7.RP.A.1	*	Solve proportional relationships involving similar figures	C/P	
OCS. Math.7.1c	7.RP.A.2.A		Decide whether two quantities are in a proportional relationship by testing for equivalent ratios or graphing on a coordinate plane	C	
OCS. Math.7.1d	7.RP.A.1	*	Compute unit rates associated with ratios of fractions, including ratios of length, area and other quantities measured in like or different units	P	
OCS. Math.7.1e	7.RP.A.2.B	*	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams and verbal descriptions of proportional relationships	C	
OCS. Math.7.1f	7.RP.A.3		Use proportional relationships to solve multistep ratio and percent problems (es: simple interest, tax, gratuities, etc)	C	
OCS. Math.7	7.NS		The Number System (NS)		
OCS.Math.7.2	7.NS.A		Apply and extend previous understandings of operations with rational numbers.		1, 2, 4, 5, 7, 8
OCS.Math.7.2a	7.NS.A.1 7.NS.A.2	*	Add, subtract, multiply and divide fractions	P	
OCS.Math.7.2b	7.NS.A.1 7.NS.A.2	*	Add, subtract, multiply and divide decimals	P	
OCS.Math.7.2c	7.NS.A.1 7.NS.A.2	*	Add, subtract, multiply and divide integers	P	
OCS.Math.7.2d	7.NS.A.1.D	*	Apply order of operations to simplify expressions	P	
OCS.Math.7.2e	7.NS.A.1.A	*	Describe situations in which opposite quantities have a sum of zero	C	
OCS.Math.7.2f	7.NS.A.1.C	*	Recognize and apply the concept of subtraction of rational numbers as adding the additive inverse	C	
OCS.Math.7.2g	7.NS.A.2.D	*	Convert fractions to decimal and classify as terminating or repeating	P	
OCS.Math.7.2h		*	Convert between fraction, decimal, and percentage format	P	
OCS.Math.7.2i	7.NS.A.3		Solve real-world and mathematical problems involving the four operations of rational numbers	C	
OCS.Math.7.3	8.NS.A		Extend knowledge of rational numbers to irrational numbers		1, 2, 4, 5, 7, 8
OCS.Math.7.3a	8.NS.A.1	*	Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number; for irrational numbers show that the decimal expansion is non-repeating and non-terminating	C	
OCS.Math.7.3b	8.NS.A.2	*	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions	C	

Archdiocese of Louisville Mathematics Standards					
Grade Seven					
Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.7	7.EE		Expressions and Equations (EE)		
OCS.Math.7.4	7.EE.A		<i>Use properties of operations to generate equivalent expressions.</i>		1, 2, 3, 7, 8
OCS.Math.7.4a	7.EE.A.1		Apply mathematical properties to add, subtract and expand linear expressions with rational coefficients	P	
OCS.Math.7.4b	7.EE.A.2	*	Understand that translating expressions from written to algebraic form and from algebraic to written form can shed light on the problem and how the quantities are related	C	
OCS.Math.7.4c	8.EE.A.1		Apply properties of integer exponents to generate equivalent numerical expressions	P	
OCS.Math.7.5	7.EE.B		<i>Solve real-life and mathematical problems using numerical and algebraic expressions and equations.</i>		1, 2, 4, 6
OCS.Math.7.5a	7.EE.B.3	*	Solve and check one and two-step equations containing rational numbers in any form	P	
OCS.Math.7.5b	7.EE.B.3		Solve and check multi-step equations containing rational numbers in any form using tools strategically	C	
OCS.Math.7.5c	7.EE.B.4.A		Graph one-step, two-step and multi-step inequalities containing rational numbers and compare the algebraic solution to an arithmetic solution	C	
OCS.Math.7.5d	7.EE.B.4.B	*	Solve real-life mathematical problems posed with rational numbers by constructing simple equations and inequalities	C	
OCS.Math.7.5f	7.EE.B.3	*	Evaluate solutions for reasonableness, accuracy and completeness in context of problem	C	
OCS.Math.7	7.G		Geometry (G)		
OCS.Math.7.6	7.G.A		<i>Draw, construct, and describe geometrical figures and describe the relationships between them.</i>		1, 2, 5, 6, 7
OCS.Math.7.6a	7.G.A.1		Reproduce a scale drawing using a different scale	P	
OCS.Math.7.6b	7.G.A.2		Construct geometric shapes with given conditions	C/P	
OCS.Math.7.6c	7.G.A.3		Describe the two-dimensional figures that result from slicing three-dimensional figures	C	
OCS.Math.7.7	7.G.B		<i>Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.</i>		1, 2, 3, 6, 7, 8
OCS.Math.7.7a	7.G.2.a		Solve problems involving scale drawings of geometric figures	C	
OCS.Math.7.7b	7.G.B.4	*	Apply formulas for area and circumference of a circle	P	
OCS.Math.7.7c		*	Apply formulas for area and perimeter of plane figures	P	
OCS.Math.7.7d	8.G.C.9		Apply formulas for volume and surface area of three-dimensional figures	P	
OCS.Math.7.7e	7.G.B.5		Apply properties of supplementary, complementary, vertical and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure	P	
OCS.Math.7.7f			Apply the triangle sum theorem to write and solve simple equations for an unknown angle in a triangle	P	

Archdiocese of Louisville Mathematics Standards					
Grade Seven					
Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS. Math.7	7.SP		Statistics and Probability (SP)		
OCS.Math.7.8	7.SP.A 7.SP.B		Draw inferences about populations.		1, 2, 5, 7
OCS.Math.7.8a	7.SP.A.2		Use random sampling to draw inferences about a population	C	
OCS.Math.7.8b	7.SP.B.4	*	Use measures of central tendency and variability for numerical data from random samples to draw informal comparative inferences about two populations	C	
OCS.Math.7.8c	7.SP.1.c		Draw inferences from two populations by comparing measures of central tendency and variability for numerical data from random samples	C	
OCS.Math.7.8d		*	Predict and infer data from a variety of data displays	C	
OCS. Math.7.9	8.SP.A.1		Investigate patterns of association in bivariate data.		
OCS.math.7.9a	8.SP.A.1		Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities	C	
OCS.math.7.9b	8.SP.A.1		Describe patterns of data such as clustering, outliers, positive or negative association, linear association and non-linear association	C	
OCS.math.7.9c	8.SP.A.2		For scatter plots that suggest a linear association, informally fit a straight line and informally assess the model fit by judging the closeness of the data points to the line	C	
OCS.Math.7.10	7.SP.C		Investigate chance processes and develop, use, and evaluate probability models.		1, 2, 4, 5, 6, 7, 8
OCS.Math.7.10a	7.SP.C.5		Demonstrate the probability of a chance event occurring is a number between zero and one	P	
OCS.Math.7.10b	7.SP.C.6		Approximate the probability of a chance event using various methods	C	
OCS.Math.7.10c	7.SP.C.7 7.SP.C.8		Develop and use probability models to determine the probability of simple and compound events	C	
OCS.Math.7.10d			Distinguish between theoretical and experimental probability	C	

Archdiocese of Louisville Mathematics Standards					
Grade Eight-Foundational Algebra					
Archloun Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.8	8.EE		Expressions and Equations		
OCS.Math.8.1	8.EE.A		Work with radicals and integer exponents.		2, 3, 5, 6, 7, 8
OCS.Math.8.1a	8.EE.A.1	*	Use properties of exponents to simplify variable expressions	P	
OCS.Math.8.1b	8.EE.A.1	*	Use properties of exponents to define negative and zero exponents	C	
OCS.Math.8.1c	8.EE.A.4		Express very large and very small quantities using scientific notation	C/P	
OCS.Math.8.1d	8.EE.A.4		Perform operations with numbers expressed in scientific notation	P	
OCS.Math.8.1e	8.EE.A.2	*	Simplify radical expressions	P	
OCS.Math.8.2	8.EE.B		Understand the connections between proportional relationships, lines, and linear equations.		1, 2, 3, 4, 7
OCS.Math.8.2a	8.EE.B.5	*	Graph and compare proportional relationships represented in different ways	C	
OCS.Math.8.2b	8.EE.B.5		Interpret a unit rate as the slope of a graph	C	
OCS.Math.8.2c	8.EE.B.5	*	Use linear equations to solve real world problems (distance, age, coin, chemical solutions)	C	
OCS.Math.8.2d	8.EE.B.6		Derive the equation $y = mx + b$	C	
OCS.Math.8.3	8.EE.C		Analyze and solve linear equations and pairs of simultaneous linear equations.		1, 2, 3, 4, 7
OCS.Math.8.3a	8.EE.C.7	*	Set-up and solve linear equations in one variable	P	
OCS.Math.8.3b	8.EE.C.7.A		Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions	C	
OCS.Math.8.3c	8.EE.C.8.	*	Analyze and solve pairs of simultaneous linear equations	P	
OCS.Math.8.3d	8.EE.C.8.A	*	Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs	C	

Archdiocese of Louisville Mathematics Standards					
Grade Eight-Foundational Algebra					
Archloun Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.8	HSA.SSE		Seeing Structure in Equations		
OCS.Math.8.4	HSA.SSE		Interpret the structure of expressions		1, 2, 4, 7
OCS.Math.8.4a	HSA.SSE.A.1	*	Interpret expressions that represent a quantity in terms of its context	C	
OCS.Math.8.4b	HSA.SSE.A.2		Use the structure of an expression to identify ways to rewrite it	P	
OCS.Math.8.5	HSA.SSE		Write expressions in equivalent forms to solve problems.		1, 2, 4, 6, 7
OCS.Math.8.5a	HSA.SSE.B.3	*	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression	C	
OCS.Math.8.5b	HSA.SSE.B.4		Derive the formula for the sum of a finite geometric series and use the formula to solve problems	C/P	
OCS.Math.8	HSA.APR		Arithmetic with Polynomials and Rational Expressions		
OCS.Math.8.6	HSA.APR.A		Perform arithmetic operations on polynomials		4, 6, 8
OCS.Math.8.6a	HSA.APR.A.1	*	Understand that polynomials form a system closed under the same operations as integers	P	
OCS.Math.8.7	HSA.APR.B		Understand the relationship between zeros and factors of polynomials.		4, 5, 6, 8
OCS.Math.8.7a	HSA.APR.B.2	*	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial	P	
OCS.Math.8.8	HSA.APR.C		Use polynomial identities to solve problems.		1, 2, 5
OCS.Math.8.8a	HSA.APR.C.4		Prove polynomial identities and use them to describe numerical relationships	C	
OCS.Math.8.9	HSA.APR.D		Rewrite rational expressions		2, 6, 7, 8
OCS.Math.8.9a	HSA.APR.D.6		Rewrite simple rational expressions in different forms using inspection, long division, or, for the more complicated examples, computer algebra systems	P	
OCS.Math.8.9b	HSA.APR.D.7	*	Understand that rational expressions form a system closed under the same operations as rational numbers	C	
OCS.Math.8.9c	HSA.APR.D.8	*	Add, subtract, multiply and divide rational expressions	P	
OCS.Math.8	HSA.CED		Creating Equations		
OCS.Math.8.10	HSA.CED.A		Create equations that describe numbers or relationships.		1, 2, 4, 8
OCS.Math.8.10a	HSA.CED.A.1	*	Create equations and inequalities in one variable and use them to solve problems	C	
OCS.Math.8.10b	HSA.CED.A.2	*	Create equations in two or more variables to represent relationships between quantities	C	
OCS.Math.8.10c	HSA.CED.A.2	*	Graph equations on coordinate axes with labels and scales	P	
OCS.Math.8.10d	HSA.CED.A.3		Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context	C	
OCS.Math.8.10e	HSA.CED.A.4	*	Rearrange formulas to highlight a quantity of interest, using the same reasoning as solving equations	P	

Archdiocese of Louisville Mathematics Standards					
Grade Eight-Foundational Algebra					
Archloun Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.8	HSA.REI		Reasoning with Equations and Inequalities		
OCS.Math.8.11	HSA.REI.A		Understand solving equations as a process of reasoning and explain the reasoning.		2, 3, 6
OCS.Math.8.11a	HSA.REI.A.1	*	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution	C	
OCS.Math.8.11b	HSA.REI.A.1	*	Construct a viable argument to justify a solution method	C	
OCS.Math.8.11c	HSA.REI.A.2		Solve simple rational and radical equations in one variable	P	
OCS.Math.8.12	HSA.REI.B		Solve equations and inequalities in one variable		1, 2, 4, 5, 7
OCS.Math.8.12a	HSA.REI.B.3	*	Solve equations and inequalities in one variable	P	
OCS.Math.8.12b	HSA.REI.B.4	*	Solve quadratic equations in one variable	P	
OCS.Math.8.12c	HSA.REI.B.4.A		Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions.	P	
OCS.Math.8.12d	HSA.REI.B.4.A		Derive the quadratic formula from the form $(x - p)^2 = q$	C	
OCS.Math.8.12e	HSA.REI.B.4.B	*	Solve quadratic equations by inspection taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the original form of the equation	C/P	
OCS.Math.8.13	HSA.REI.C		Solve systems of equations.		2, 4, 5, 6
OCS.Math.8.13a	HSA.REI.C.5	*	Solve a system of two equations in two variables by graphing, substitution, and elimination	P	
OCS.Math.8.13b	HSA.REI.C.6	*	Solve systems of linear equations exactly and approximately (with graphs) focusing on pairs of linear equations in two variables	C/P	
OCS.Math.8.13c			Solve a simple system of a linear equation and a quadratic equation in two variables graphically	P	
OCS.Math.8.14	HSA.REI.D		Represent and solve equations and inequalities graphically.		2, 3, 7
OCS.Math.8.14a	HSA.REI.D.10	*	Understand that the graph of an equation in two variables is the set of all its solutions plotted on the coordinate plane, often forming a curve or a line	C	
OCS.Math.8.14b	HSA.REI.D.11	*	Explain why the x coordinates of the intersections of two equations are the solutions $(f(x) = g(x))$	C	

Archdiocese of Louisville Mathematics Standards					
Grade Eight-Foundational Algebra					
Archloun Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.8	8.F		Functions (F)		
OCS.Math.8.15	8.F.1		Define, evaluate, and compare functions.		1, 2, 4, 7, 8
OCS.Math.8.15a	8.F.A.1	*	Use multiple representations to show a function is a rule that assigns exactly one output to one input	C	
OCS.Math.8.15b	8.F.A.1	*	Identify the graph of a function as a set of ordered pairs consisting of an input and a corresponding output	C	
OCS.Math.8.15c	8.F.A.2	*	Compare properties of two functions in multiple ways (algebraically, graphically, numerically in tables or verbal descriptions)	C	
OCS.Math.8.15d	8.F.A.3	*	Define linear equations as functions whose graph is a straight line	C	
OCS.Math.8.15e	8.F.A.3	*	Interpret the equation $y = mx + b$ as defining a linear function	C	
OCS.Math.8.15f	8.F.A.3	*	Give examples of functions that are not linear	C	
OCS.Math.8.16	8.F.B		Use functions to model relationships between quantities.		3, 4, 5, 7, 8
OCS.Math.8.16a	8.F.B.4		Calculate the rate of change from a set of data	P	
OCS.Math.8.16b	8.F.B.4		Write and graph a function to represent the rate of change in order to solve a problem	P	
OCS.Math.8.16c	8.F.B.5	*	Describe qualitatively the functional relationship between two quantities by analyzing a graph	C	
OCS.Math.8.16d	8.F.B.5	*	Sketch a graph that exhibits the qualitative features of a function that has been described verbally	C	
OCS.Math.8	8.G		Geometry (G)		
OCS.Math.8.17	8.G.A		Understand congruence and similarity using physical models, transparencies, or geometry software		2, 3, 4, 8
OCS.Math.8.17a	8.G.A.1		Verify experimentally the properties of rotations, reflections and translations (lines are taken to lines, line segments to line segments of the same length, angles are taken to angles of the same measure and parallel lines are taken to parallel lines)	C	
OCS.Math.8.17b	8.G.A.2	*	Understand that a two dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations	C	
OCS.Math.8.17c	8.G.A.2		Given two congruent figures, describe a sequence that exhibits the congruence between them	C	
OCS.Math.8.17d	8.G.A.3	*	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates	C	
OCS.Math.8.17e	8.G.A.4	*	Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations	C	
OCS.Math.8.17f	8.G.A.5		Given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them	C	
OCS.Math.8.17g	8.G.A.5		Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles	C	
OCS.Math.8.18	8.G.B		Apply the Pythagorean Theorem.		1, 2, 3, 4, 5, 6, 7
OCS.Math.8.18a	8.G.B.6	*	Explain the proof of the Pythagorean Theorem and its converse	C	
OCS.Math.8.18b	8.G.B.7	*	Apply the Pythagorean Theorem to calculate the unknown side length of a right triangle	P	

Archdiocese of Louisville Mathematics Standards					
Grade Eight-Foundational Algebra					
Archlou Code	Related CC standard code	Essential Standard?	Standards for Mathematical Content	C/P?	Suggested Standards for Mathematical Practices
OCS.Math.8.18c	8.G.B.8		Apply the Pythagorean Theorem to calculate the distance between two points on the coordinate plane	P	
OCS.Math.8.19	8.G.C		<i>Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.</i>		1, 7, 8
OCS.Math.8.19a	8.G.C.9	*	Apply geometric formulas to solve real-world and mathematical problems	C	
OCS.Math.8	8.SP		Statistics and Probability (SP)		
OCS.Math.8.20	8.SP.A		<i>Investigate patterns of association in bivariate data.</i>		2, 4, 8
OCS.Math.8.20a	8.SP.A.3	*	Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept	C	
OCS.Math.8.20b	8.SP.A.4		Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table	C	
OCS.Math.8.20c	8.SP.A.4		Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects	P	
OCS.Math.8.20d	8.SP.A.4		Use relative frequencies calculated for rows or columns to describe possible association between the two variables	C	