



Integrated Faith Standards for Academic Curriculum

Mathematics Curriculum

Kindergarten – Grade 12

*Revised 2022

“Education is an important mission, which draws young people to what is good, beautiful, and true.”

Pope Francis

Diocese of Manchester Catholic School Standards for Mathematics

Mathematics is the study of quantity, structure, space, and change. Attention should be paid to the needs of today's society in teaching mathematics by fostering real world application, enabling students to undertake responsibilities in society both locally and globally while witnessing to the faith.

Individual subjects must be taught according to their own particular methods. It would be wrong to consider subjects as mere adjuncts to faith or as a useful means of teaching apologetics. They enable the pupil to assimilate skills, knowledge, intellectual methods and moral and social attitudes, all of which help to develop his personality and lead him to take his place as an active member of the community of man. Their aim is not merely the attainment of knowledge but the acquisition of values and the discovery of truth. *The Catholic School*, 39

After extensive research and review, the Diocesan Academic Committee determined that the *Mathematics Content Standards for California Public Schools* adopted by the California State Board of Education in 1997 and revised in 2000 (pre-Common Core and No Child Left Behind Act), contained the necessary competencies vital to a high-quality mathematics program. "Mathematics is critical for all students, not only those who will have careers that demand advanced mathematical preparation but all citizens who will be living in the twenty-first century. These standards are based on the premise that all students are capable of learning rigorous mathematics and learning it well, and all are capable of learning far more than is currently expected." (Eastin, 2000).

In studying mathematics, we desire that our students in Catholic Schools will be able to:

- Demonstrate the mental practices of precise, determined, meticulous and accurate questioning, inquiry and reasoning
- Respond to the beauty, harmony, proportion, and wholeness existing in mathematics
- Appreciate how mathematical arguments and procedures can be inferred and practiced in other areas of study, including theology and philosophy
- Propose how mathematical objects or proofs (including the Fibonacci numbers, the musical scale, and geometric proofs) support Divine origin.

We believe that the proposed Diocesan Curriculum Standards for Mathematics adapted and reprinted *Mathematic Content Standards for California Public Schools – Kindergarten Through Grade Twelve* (2000) with permission from the California Department of Education, will help us begin building an educational paradigm that will enable our students to grow in logic and reason with the ability to discern and grow in academic acumen. "Yet the human mind invented mathematics in order to understand creation; but if nature is really structured with a mathematical language and mathematics invented by man can manage to understand it, this demonstrates something extraordinary" Pope Benedict XVI (2006).

Basic Principles Underlying All Standards to be Used for the Planning of Curriculum for the Diocese of Manchester

- A passion for mission should inform every curriculum decision.
- All knowledge reflects God's Truth, Beauty, and Goodness.
- Curriculum and instruction enable deeper incorporation of the children into the Church, the formation of community within the school, and respect for the uniqueness and dignity of each person as created in the image and likeness of God.
- Education fosters growth in Christian virtue and contributes to development and formation of the whole person for the good of the society of which he/she is a member, and in recognition of their destiny, an eternal life in Christ.

- Each subject is to be examined in the context of the Catholic faith through Scripture and Tradition and is to be illuminated by Gospel values.
- Learning and formation are interconnected, as are the natural and spiritual development of each student.
- Curriculum and instruction seek to promote a synthesis of faith, life, and culture, forming students as disciples of Jesus.
- All curricula must support a commitment to strong and consistent Catholic identity.
- Curriculum will assist the student’s ability to think critically, problem solve, innovate, and lead towards a supernatural vision.

In a Catholic School, Curricular Formation...

1. Involves the integral formation of the whole person, body, mind, and spirit, in light of his or her ultimate end and the good of society.ⁱ
2. Promotes human virtues and the dignity of the human person as created in the image and likeness of God and modeled on the person of Jesus Christ.ⁱⁱ
3. Seeks to know and understand objective reality, which includes transcendent Truth, is knowable by reason and faith, and finds its origin, unity, and end in God.
4. Develops a Catholic worldview and enables a deeper incorporation of the student into the heart of the Catholic Church.ⁱⁱⁱ
5. Encourages a synthesis of faith, life, and culture.^{iv}

Kindergarten - Grade 8 Mathematics Catholic Integrated Faith Standards

Kindergarten through Grade 5 Mathematics Integration of Faith

- K-5.MA.IF.1** Recognize the power of the human mind as both a gift from God and a reflection of Him in whose image and likeness we are made.
- K-5.MA.IF.2** Display a sense of wonder about mathematical relationships as well as confidence in mathematical certitude.
- K-5.MA.IF.3** Respond to the beauty, harmony, proportion, radiance, and wholeness present in mathematics.
- K-5.MA.IF.4** Show interest in the pursuit of understanding for its own sake.
- K-5.MA.IF.5** Exhibit joy at solving difficult mathematical problems and operations.
- K-5.MA.IF.6** Show interest in how the mental processes evident within the discipline of mathematics (such as order, perseverance, and logical reasoning) help us to develop natural virtues (such as self-discipline and fortitude).
- K-5.MA.IF.7** Understand why things are true and why they are false.

Grade 6 through Grade 8 Mathematics Integration of Faith

- 6-8.MA.IF.1** Recognize the power of the human mind as both a gift from God and a reflection of Him in whose image and likeness we are made.
- 6-8.MA.IF.2** Display a sense of wonder about mathematical relationships as well as confidence in mathematical certitude.
- 6-8.MA.IF.3** Respond to the beauty, harmony, proportion, radiance, and wholeness present in mathematics.
- 6-8.MA.IF.4** Show interest in the pursuit of understanding for its own sake.
- 6-8.MA.IF.5** Exhibit joy at solving difficult mathematical problems and operations.
- 6-8.MA.IF.6** Show interest in how the mental processes evident within the discipline of mathematics (e.g., order, perseverance, and logical reasoning) help us with the development of natural virtues (such as self-discipline and fortitude).
- 6-8.MA.IF.7** Further connecting the discipline within mathematics to the development of natural virtues.
- 6-8.MA.IF.8** Survey the truths about mathematical objects that are interesting in their own right and independent of human opinions.
- 6-8.MA.IF.9** Demonstrate the mental habits of precise, determined, careful, and accurate questioning, inquiry, and reasoning.
- 6-8.MA.IF.10** Continue to develop lines of inquiry (as developmentally appropriate) to understand why things are true and why they are false.

By the end of kindergarten, students understand small numbers, quantities, and simple shapes in their everyday environment. They count, compare, describe, and sort objects and develop a sense of properties and patterns. In the Kindergarten curriculum, mathematics should be primarily play based.

Number Sense

- K.MT.NS-1.0** Students understand the relationship between numbers and quantities (i.e., that a set of objects has the same number of objects in different situations regardless of its position or arrangement):
- K.MT.NS-1.1** Compare two or more sets of objects (up to 10 objects in each group) and identify which set is equal to, more than, or less than the other.
- K.MT.NS-1.2** Count, recognize, represent, name, and order a number of objects (up to 30).
- K.MT.NS-1.3** Know that the larger numbers describe sets with more objects in them than sets of smaller numbers.
- K.MT.NS-2.0** Students understand and describe simple additions and subtractions:
- K.MT.NS-2.1** Use concrete objects (manipulatives) to determine the answers to addition and subtraction problems (for two numbers that are each less than 10).
- K.MT.NS-3.0** Students use estimation strategies in computation and problem solving that involve numbers that use the ones and tens places:
- K.MT.NS-3.1** Recognize when an estimate is reasonable.

Algebra and Functions

- K.MT.AF-1.0** Students sort and classify objects:
- K.MT.AF-1.1** Identify, sort, and classify objects by attribute and identify objects that do not belong to a particular group (e.g., all these balls are green, those are red).

Measurement and Geometry

- K.MT.MG-1.0** Students understand the concept of time and units to measure it; they understand that objects have properties, such as length, weight, and capacity, and that comparisons may be made by referring to those properties:
- K.MT.MG-1.1** Compare the length, weight, and capacity of objects by making direct comparisons with reference objects (e.g., note which object is shorter, longer, taller, lighter, heavier, or holds more).
- K.MT.MG-1.2** Demonstrate an understanding of concepts of time (e.g., morning, afternoon, evening, today, yesterday, tomorrow, week, year) and tools that measure time (e.g., clock, calendar).
- K.MT.MG-1.3** Name the days of the week.
- K.MT.MG-1.4** Identify the time (to the nearest hour) of everyday events (e.g., lunchtime is 12 o'clock; bedtime is 8 o'clock at night).
- K.MT.MG-2.0** Students identify common objects in their environment and describe the geometric features:
- K.MT.MG-2.1** Identify and describe common geometric objects (e.g., circle, triangle, square, rectangle, cube, sphere, cone).

K.MT.MG-2.2 Compare familiar plane and solid objects by common attributes (e.g., position, shape, size, roundness, number of corners).

Statistics, Data Analysis, and Probability

K.MT.SD-1.0 Students collect information about objects and events in their environment:
K.MT.SD-1.1 Pose information questions; collect data; and record the results using objects, pictures, and picture graphs.
K.MT.SD-1.2 Identify, describe, and extend simple patterns (such as circles or triangles) by referring to their shapes, sizes, or colors.

Mathematical Reasoning

K.MT.MR-1.0 Students make decisions about how to set up a problem:
K.MT.MR-1.1 Determine the approach, materials, and strategies to be used.
K.MT.MR-1.2 Use tools and strategies, such as manipulatives or sketches, to model problems.
K.MT.MR-2.0 Students solve problems in reasonable ways and justify their reasoning:
K.MT.MR-2.1 Explain the reasoning used with concrete objects and/or pictorial representations.
K.MT.MR-2.2 Make precise calculations and check the validity of the results in the context of the problem.