



The Diocese of Birmingham in Alabama
Catholic Schools Office



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Introduction to the Diocese of Birmingham Mathematics Course of Study

Pope Benedict XVI, in his address to Catholic Educators in Washington, DC on April 17, 2008, stated that “Catholic schools are an outstanding apostolate of hope... addressing the material, intellectual and spiritual needs of three million children.” He also said “Education is integral to the mission of the Church to proclaim the good news.” The United States Conference of Catholic Bishops, in their document, *Renewing our Commitment to Catholic Elementary and Secondary Schools in the Third Millennium* (2005), said “Our vision is clear: our Catholic schools are a vital part of the teaching mission of the Church...We must respond to challenging times with faith, vision and the will to succeed because the Catholic school’s mission is vital to the future of our young people, our nation, and most especially to the Church.”

The National Standards and Benchmarks for Effective Catholic Elementary and Secondary Schools (2012) was created to define the characteristics of Catholic schools and develop performance benchmarks to assist and support all those involved in Catholic education to assess, refine and continue with the Catholic Church’s mission. The Nine Defining Characteristics of a Catholic school are:

1. Centered in the Person of Jesus Christ.
2. Contributing to the Evangelizing Mission of the Church.
3. Distinguished by Excellence.
4. Committed to Educate the Whole Child.
5. Steeped in a Catholic Worldview.
6. Sustained by Gospel Witness.
7. Shaped by Communion and Community.
8. Accessible to All Students.
9. Established by the Expressed Authority of the Bishop.

What do we mean by “Distinguished by Excellence?” “The academic program should be rigorous and doctrinally sound with curricular experiences that are rigorous, relevant, research-based, and infused with Catholic faith and traditions.”(National Standards and Benchmarks for Effective Catholic Elementary and Secondary Schools, 2012.) Specifically, our instructional program must prepare students to live in the 21st century with all the skills and knowledge necessary to be successful. Benchmark 7.1 states “The curriculum adheres to appropriate, delineated standards, and is vertically aligned to ensure that every student successfully completes a rigorous and coherent sequence of academic courses based on the standards and rooted in Catholic values. ”

The Diocesan Standards and Benchmarks for Mathematics were developed by teachers across the Diocese who contributed their expertise to this initiative. I would like to personally thank all those whose knowledge and commitment contributed to this document.

Fran Lawlor
Superintendent of Schools



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Overview of Diocesan Mathematics Course of Study

The Diocesan Mathematics Course of Study contains the minimal content standards for each grade level or class and is intended to define essential content for each level. Each grade level Course of Study builds upon the previous and therefore it is imperative to understand the content contained in each separate grade/class and recognize it as required content for that grade. Each Course of Study can be enriched and strengthened by attending to the level of knowledge required to apply the content standard or skill in various situations. By strengthening the level of the depth of knowledge we challenge students to apply and transfer knowledge. This process will add rigor to the Course of Study as determined by the needs of the children we serve.



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Diocesan Standards of Practice

These standards are based on the *National Standards and Benchmarks for Effective Catholic Elementary and Secondary Schools*. The Diocesan Standards of Practice are gleaned from *Section Two: Academic Excellence Standards 7-9*. Four practice standards have been developed for the students and two for the classroom. These standards are applicable in all subject areas taught in our schools as well as any work that is an extension of our schools as they exemplify the positive Catholic identity for which we strive.

For students:

- Students will make connections to Gospel Values across content areas.
- Students will develop and demonstrate critical thinking, perseverance, and strong work habits.
- Students will be reflective, considerate problem solvers.
- Students will develop and demonstrate the ability to be moral evaluators and socially responsible global citizens.

For the classroom:

- Gospel values will be modeled through effective instruction, cultural sensitivity and an environment of continuous improvement.
- Students will be assessed frequently, fairly and with consideration for the whole child.



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INSTRUCTIONS

A Perspective for the Mathematics Domains/Sub-Categories

“Too often, mathematics instruction gives students the erroneous notion that learning math is all about learning procedures, rather than making sense of ideas...We should be mindful of what our students understand, not merely what they can do.” *Uncovering the Math Curriculum* by Marilyn Burns (Educational Leadership, October 2014).

Mathematics instruction today is moving away from memorization of facts and formulas to helping students understand the underlying concepts behind the formulas and procedures. The proficiencies students will need to acquire have been discussed in depth from several perspectives:

- The National Council of Teachers of Mathematics process standards include: problem solving, reasoning and proof, communication, representation, and connections. *Principles and Standards for School Mathematics*. Reston, Virginia: National Council of Teachers of Mathematics, 2000.
- The National Research Council’s report identifies the following proficiencies: adaptive reasoning, conceptual understanding, procedural fluency, and productive disposition. Kilpatrick, Jeremy, Jane Swafford and Bradford Findell, Eds. *Adding It Up: Helping Children Learn Mathematics*. Washington, D.C.: Mathematics Learning Study Committee, National Research Council (NCR), 2001.
- Standard 7 of the National Catholic Standards and Benchmarks talks about the 21st century skills our students will need: the ability to be creative, reflective, literate, critical, and moral evaluators, problem solvers, decision makers, and socially responsible global citizens. *National Standards and Benchmarks for Effective Catholic Elementary and Secondary Schools*. Center for Catholic School Effectiveness, School of Education, Loyola University Chicago, in partnership with the Barbara and Patrick Roche Center for Catholic Education, Lynch School of Education, Boston College. (2012)

In her article, *“Knowing What We Teach and Teaching What We Know,”* (1999, November) NCTM News Bulletin (online newsletter) Glenda Lappan, a past president of the National Council of Teachers of Mathematics, said: *“Our own content knowledge affects how we interpret the content goals we are expected to reach with our students. It affects the way we hear and respond to our students and their questions. It affects our ability to explain clearly and to ask good questions. It affects our ability to approach a mathematical idea flexibly with our students and to make connections. It affects our ability to push each student at that special moment when he or she is ready or curious. And it affects our ability to make those moments happen more often for our students.”*

It is our hope that the Diocesan Standards and Benchmarks in Mathematics Guide will be a step in our goal of helping our students acquire the proficiencies and content knowledge necessary to be successful in college and the work place.



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INSTRUCTIONS (Continue)

Organization of Mathematics Domains/Sub-Categories

Counting and Cardinality (Kindergarten only)

- Number names and count sequence.
- Counting to tell the number of objects.
- Comparing Numbers

Operations and Algebraic Thinking K-5

Number and Operations in Base Ten K-5

Number and Operations- Fractions 3-5

Measurement and Data K-5

Geometry K-8

Ratios and Proportional Relationships 6-7

The Number System 6-8

Expressions and Equations 6-8

Statistics and Probability 6-8

Functions 8

Conceptual Categories for High School Mathematics

Number and Quantity

Algebra

Functions

Modeling

Geometry

Statistics and Probability