Technology
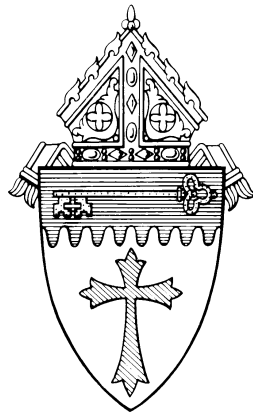# Curriculum Standards

Catholic Schools Office

Diocese of Erie

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Philosophy Statement

Current and emerging technologies play a prominent role in the education of the whole child. Access to technologies opens the door to the world beyond the classroom and increases the students' chances for success.

In our Catholic schools, students shall be instructed to utilize available technologies for education, communication, problem solving, analysis, and research in accordance with Catholic values, ethical principles, and moral decision making. Students shall have the opportunity to locate, process, and use information in order to improve their abilities to learn, communicate, reason, and work.

The curriculum of the school will be the foundation of incorporated technologies. The technologies will not be the driving force of the curriculum but rather the tools to achieve an integrated, cross-disciplinary learning environment that mirrors the real world.

Technology Curriculum Foundation

The technology curriculum of the Catholic Diocese of Erie includes concept formation and processes expressed by performance indicators. Each level of the curriculum has cross-curricular objectives that encompass hands-on approaches to student learning. The Catholic Diocese of Erie has adopted the ISTE National Education Technology Standards (NETS) and these are correlated with the Pennsylvania State Academic Standards for Science and Technology.

NETS (National Educational Technology Standards) for Students
Technology Foundation Standards for All Students

The technology foundation standards for students are divided into six broad categories. Standards within each category are to be introduced, reinforced, and mastered by students. These categories provide a framework for linking performance indicators within the Profiles for Technology Literate Students to the standards. Teachers can use these standards and profiles as guidelines for planning technology-based activities in which students achieve success in learning, communication, and life skills.

Technology Foundation Standards for Students

T1. Creativity and Innovation

Students demonstrate creative thinking, construct knowledge, and develop innovative products and processes using technology. Students:

T1.a. apply existing knowledge to generate new ideas, products, or processes.

T1.b. create original works as a means of personal or group expression.

T1.c. use models and simulations to explore complex systems and issues.

T1.d. identify trends and forecast possibilities.

T2. Communication and Collaboration

Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others. Students:

T2.a. interact, collaborate, and publish with peers, experts, or others employing a variety of digital environments and media.

T2.b. communicate information and ideas effectively to multiple audiences using a variety of media and formats.

T2.c. develop cultural understanding and global awareness by engaging with learners of other cultures.

T2.d. contribute to project teams to produce original works or solve problems.

T3. Research and Information Fluency

Students apply digital tools to gather, evaluate, and use information. Students:

   T3.a. plan strategies to guide inquiry.

   T3.b. locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.

   T3.c. evaluate and select information sources and digital tools based on the appropriateness to specific tasks.

   T3.d. process data and report results.

T4. Critical Thinking, Problem Solving, and Decision Making

Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources. Students:

   T4.a. identify and define authentic problems and significant questions for investigation.

   T4.b. plan and manage activities to develop a solution or complete a project.

   T4.c. collect and analyze data to identify solutions and/or make informed decisions.

   T4.d. use multiple processes and diverse perspectives to explore alternative solutions.

T5. Digital Citizenship

Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior. Students:

   T5.a. advocate and practice safe, legal, and responsible use of information and technology.

   T5.b. exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity.

   T5.c. demonstrate personal responsibility for lifelong learning.

   T5.d. exhibit leadership for digital citizenship.

T6. Technology Operations and Concepts

Students demonstrate a sound understanding of technology concepts, systems, and operations. Students:

T6.a. understand and use technology systems.
T6.b. select and use applications effectively and productively.
T6.c. troubleshoot systems and applications.
T6.d. transfer current knowledge to learning of new technologies.

Profiles for Technology Literate Students

A major component of the NETS Project is the development of a general set of profiles describing technology (ICT) literate students at key developmental points in their precollege education. The profiles highlight a few important types of learning activities in which students might engage as the new NETS•S are implemented. These examples are provided in an effort to bring the standards to life and demonstrate the variety of activities possible. The profiles are divided into the following four grade ranges.

1. Pre-school – grade 2
2. Grades 3 -5
3. Grades 6 – 8
4. Grades 9 – 12

Reference the individual standards charts for each grade range.

NETS (National Educational Technology Standards) for Teachers

Educational Technology Standards and Performance Indicators for Teachers

1. Facilitate and Inspire Student Learning and Creativity

Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments. Teachers:

a. promote, support, and model creative and innovative thinking and inventiveness.

b. engage students in exploring real-world issues and solving authentic problems using digital tools and resources.

c. promote student reflection using collaborative tools to reveal and clarify students' conceptual understanding and thinking, planning, and creative processes.

d. model collaborative knowledge construction by engaging in learning with students, colleagues, and others in face-to-face and virtual environments.

2. Design and Develop Digital-Age Learning Experiences and Assessments

Teachers design, develop, and evaluate authentic learning experiences and assessment incorporating contemporary tools and resources to maximize content learning in context and to develop the knowledge, skills, and attitudes identified in the NETS•S. Teachers:

a. design or adapt relevant learning experiences that incorporate digital tools and resources to promote student learning and creativity.

b. develop technology-enriched learning environments that enable all students to pursue their individual curiosities and become active participants in setting their own educational goals, managing their own learning, and assessing their own progress.

c. customize and personalize learning activities to address students' diverse learning styles, working strategies, and abilities using digital tools and resources.

d. provide students with multiple and varied formative and summative assessments aligned with content and technology standards and use resulting data to inform learning and teaching.

3. Model Digital-Age Work and Learning

Teachers exhibit knowledge, skills, and work processes representative of an innovative professional in a global and digital society. Teachers:

a. demonstrate fluency in technology systems and the transfer of current knowledge to new technologies and situations.

b. collaborate with students, peers, parents, and community members using digital tools and resources to support student success and innovation.

c. communicate relevant information and ideas effectively to students, parents, and peers using a variety of digital-age media and formats.

d. model and facilitate effective use of current and emerging digital tools to locate, analyze, evaluate, and use information resources to support research and learning.

4. Promote and Model Digital Citizenship and Responsibility

Teachers understand local and global societal issues and responsibilities in an evolving digital culture and exhibit legal and ethical behavior in their professional practices. Teachers:

a. advocate, model, and teach safe, legal, and ethical use of digital information and technology, including respect for copyright, intellectual property, and the appropriate documentation of sources.

b. address the diverse needs of all learners by using learner-centered strategies providing equitable access to appropriate digital tools and resources.

c. promote and model digital etiquette and responsible social interactions related to the use of technology and information.

d. develop and model cultural understanding and global awareness by engaging with colleagues and students of other cultures using digital-age communication and collaboration tools.

5. Engage in Professional Growth and Leadership

Teachers continuously improve their professional practice, model lifelong learning, and exhibit leadership in their school and professional community by promoting and demonstrating the effective use of digital tools and resources. Teachers:

a. participate in local and global learning communities to explore creative applications of technology to improve student learning.

b. exhibit leadership by demonstrating a vision of technology infusion, participating in shared decision making and community building, and developing the leadership and technology skills of others.

c. evaluate and reflect on current research and professional practice on a regular basis to make effective use of existing and emerging digital tools and resources in support of student learning.

d. contribute to the effectiveness, vitality, and self-renewal of the teaching profession and of their school and community.

NETS (National Educational Technology Standards) for Administrators

Educational Technology Standards and Performance Indicators for Administrators

1. Visionary Leadership

Educational Administrators inspire and lead development and implementation of a shared vision for comprehensive integration of technology to promote excellence and support transformation throughout the organization. Educational Administrators:

a. inspire and facilitate among all stakeholders a shared vision of purposeful change that maximizes use of digital-age resources to meet and exceed learning goals, support effective instructional practice, and maximize performance of district and school leaders.

b. engage in an ongoing process to develop, implement, and communicate technology-infused strategic plans aligned with a shared vision.

c. advocate on local, state and national levels for policies, programs, and funding to support implementation of a technology-infused vision and strategic plan.

2. Digital Age Learning Culture

Educational Administrators create, promote, and sustain a dynamic, digital-age learning culture that provides a rigorous, relevant, and engaging education for all students. Educational Administrators:

a. ensure instructional innovation focused on continuous improvement of digital-age learning.

b. model and promote the frequent and effective use of technology for learning.

c. provide learner-centered environments equipped with technology and learning resources to meet the individual, diverse needs of all learners.

d. ensure effective practice in the study of technology and its infusion across the curriculum.

e. promote and participate in local, national, and global learning communities that stimulate innovation, creativity, and digital-age collaboration.

3. Excellence in Professional Practice

Educational Administrators promote an environment of professional learning and innovation that empowers educators to enhance student learning through the infusion of contemporary technologies and digital resources. Educational Administrators:

a. allocate time, resources, and access to ensure ongoing professional growth in technology fluency and integration.

b. facilitate and participate in learning communities that stimulate, nurture and support administrators, faculty, and staff in the study and use of technology.

c. promote and model effective communication and collaboration among stakeholders using digital-age tools.

d. stay abreast of educational research and emerging trends regarding effective use of technology and encourage evaluation of new technologies for their potential to improve student learning.

4. Systemic Improvement

Educational Administrators provide digital-age leadership and management to continuously improve the organization through the effective use of information and technology resources. Educational Administrators:

a. lead purposeful change to maximize the achievement of learning goals through the appropriate use of technology and media-rich resources.

b. collaborate to establish metrics, collect and analyze data, interpret results, and share findings to improve staff performance and student learning.

c. recruit and retain highly competent personnel who use technology creatively and proficiently to advance academic and operational goals.

d. establish and leverage strategic partnerships to support systemic improvement.

e. establish and maintain a robust infrastructure for technology including integrated, interoperable technology systems to support management, operations, teaching, and learning.

5. Digital Citizenship

Educational Administrators model and facilitate understanding of social, ethical and legal issues and responsibilities related to an evolving digital culture. Educational Administrators:

a. ensure equitable access to appropriate digital tools and resources to meet the needs of all learners.

b. promote, model and establish policies for safe, legal, and ethical use of digital information and technology.

c. promote and model responsible social interactions related to the use of technology and information.

d. model and facilitate the development of a shared cultural understanding and involvement in global issues through the use of contemporary communication and collaboration tools.

Technology Standards: 1. Creativity and Innovation   2. Communication and Collaboration   3. Research and Information Fluency

12   4. Critical Thinking, Problem Solving, and Decision Making   5. Digital Citizenship   6. Technology Operations and Concepts

Expectations for Grade K - Grade 2	Sample Problem / Project	Pacing	Assessment	Resources
Illustrate and communicate original ideas and stories using digital tools and media-rich resources. (1,2)				
Identify, research, and collect data on an environmental issue using digital resources and propose an appropriate solution. (1,3,4)				
Engage in learning activities with learners from multiple cultures through e-mail and other electronic means. (2,6)				
In a collaborative work group, use a variety of technologies to produce a digital presentation or product in a curriculum area. Utilize one technology at a time. (1,2,6)				
Find and evaluate information related to a current or historical person or event using digital resources. (3)				
Use simulations and graphical organizers to explore and depict patterns of growth such as the life cycles of plants and animals. (1,3,4)				
Demonstrate safe/cooperative use of technology. (5)				
Independently apply digital tools and resources to address a variety of tasks and problems. (4,6)				
Communicate about technology using developmentally appropriate and accurate terminology. (6)				
Demonstrate the ability to navigate in virtual environments such as electronic books, simulation software, and Web sites. (6)				

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Expectations for Grade 3 - Grade 5	Sample Problem / Project	Pacing	Assessment	Resources
Produce a media-rich digital story about a significant local event based on first-person interviews. (1,2,3,4)				
Use digital-imaging technology to modify or create works of art for use in a digital presentation. (1,2,6)				
Recognize bias in digital resources while researching an environmental issue with guidance from the teacher. (3,4)				
Select and apply digital tools to collect, organize, and analyze data to evaluate theories or test hypotheses. (3,4,6)				
Identify and investigate a global issue and generate possible solutions using digital tools and resources. (3,4)				
Conduct science experiments using digital instruments and measurement devices. (4,6)				
Conceptualize, guide, and manage individual or group learning projects using digital planning tools with teacher support. (4,6)				
Practice injury prevention by applying a variety of ergonomic strategies when using technology. (5)				
Debate the effect of existing and emerging technologies on individuals, society, and the global community. (5,6)				
Apply previous knowledge of digital technology operations to analyze and solve current hardware and software problems. (4,6)				

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Expectations for Grade 6 - Grade 8	Sample Problem / Project	Pacing	Assessment	Resources
Describe and illustrate a content-related concept or process using a model, simulation, or concept-mapping software. (1,2)				
Create original animations or videos documenting school, community, or local events. (1,2,6)				
Gather data, examine patterns, and apply information for decision making using digital tools and resources. (1,4)				
Participate in a cooperative learning project in an online learning community. (2)				
Evaluate digital resources to determine the credibility of the author and publisher and the timeliness and accuracy of the content. (3)				
Employ data-collection technology such as probes, handheld devices, and geographic mapping systems to gather, view, analyze, and report results for content-related problems. (3,4,6)				
Select and use the appropriate tools and digital resources to accomplish a variety of tasks and to solve problems. (3,4,6)				
Use collaborative electronic authoring tools to explore common curriculum content from multicultural perspectives with other learners. (2,3,4,5)				
Integrate a variety of file types to create and illustrate a document or presentation. (1,6)				
Independently develop and apply strategies for identifying and solving routine hardware and software problems. (4,6)				

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Expectations for Grade 9 - Grade 12	Sample Problem / Project	Pacing	Assessment	Resources
Design, develop, and test a digital learning game to demonstrate knowledge and skills related to curriculum content. (1,4)				
Create and publish an online art gallery with examples and commentary that demonstrate an understanding of different historical periods, cultures, and countries. (1,2)				
Select digital tools or resources to use for a real-world task and justify the selection based on their efficiency and effectiveness. (3,6)				
Employ curriculum-specific simulations to practice critical-thinking processes. (1,4)				
Identify a complex global issue, develop a systematic plan of investigation, and present innovative sustainable solutions. (1,2,3,4)				
Analyze the capabilities and limitations of current and emerging technology resources and assess their potential to address personal, social, lifelong learning, and career needs. (4,5,6)				
Design a Web site that meets accessibility requirements. (1,5)				
Model legal and ethical behaviors when using information and technology by properly selecting, acquiring, and citing resources. (3,5)				
Create media-rich presentations for other students on the appropriate and ethical use of digital tools and resources. (1,5)				
Configure and troubleshoot hardware, software, and network systems. (4,6)				