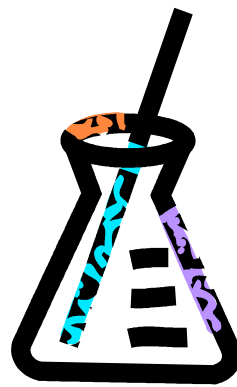


DIOCESE OF VENICE

SCIENCE CURRICULUM GUIDE

GRADES PRE-K - 12

August 1, 2006



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SCIENCE GOALS

The Diocese of Venice Catholic Schools are preparing students to be productive contributors to both the Catholic Church and society. Science is an important part of the total education of our students.

Students in the Diocese of Venice Catholic Schools are nurtured and encouraged to attain the following goals:

- Learn to value science
- Become confident in one's own ability to apply scientific principles
- Be able to integrate Catholic values with concepts and the application of scientific principles
- Become responsible and ethical students in the care of the environment

STRANDS AND STANDARDS

A. The Nature of Matter

1. The student understands that all matter has observable and measurable properties.
2. The student understands the basic principles of atomic theory.

B. Energy

1. The student recognizes that energy may be changed in form with varying efficiency.
2. The student understands the interaction of matter and energy.

C. Force and Motion

1. The student understands that types of motion may be described, measured, and predicted.
2. The student understands that the types of force that act on an object and the effect of that force can be described, measured, and predicted.

D. Processes that Shape the Earth

1. The student recognizes that processes in the lithosphere, atmosphere, hydrosphere, and biosphere interact to shape the Earth.
2. The student understands the need for protection of the natural systems on Earth.

E. Earth and Space

1. The student understands the interaction and organization in the Solar System and the universe and how this affects life on Earth.
2. The student recognizes the vastness of the universe and the Earth's place in it.

F. Processes of Life

1. The student describes patterns of structure and function in living things.
2. The student understands the process and importance of genetic diversity.

G. How Living Things Interact With Their Environment

1. The student understands the competitive, interdependent, cyclic nature of living things in the environment.
2. The student understands the consequences of using limited natural resources.

H. The Nature of Science

1. The student uses the scientific processes and habits of mind to solve problems.
2. The student understands that most natural events occur in comprehensible, consistent patterns.
3. The student understands that science, technology, and society are interwoven and interdependent.

*Florida Sunshine State Standards

SCIENCE

THE NATURE OF MATTER

The student will be able to...

OBJECTIVES - Standard 1	PreK	K	1	2	3	4	5	6	7	8
The student understands that all matter has observable, measurable properties.										
1. Use scientific measuring, such as rulers, balances, non-standard, etc., tools to compare different forms of matter.	I	D	D	D	D	D	D	M	E	E
2. Identify, compare and contrast solids, liquids, gases, and plasma.		I	D	D	M	E	E	E	E	E
3. Identify the physical properties of objects and materials.	I	D	D	M	E	E	E	E	E	E
4. Identify the chemical properties of objects and materials.						I	D	D	D	D
5. Differentiate between physical and chemical changes in matter.						I	D	D	D	M
6. Define and discuss volume, mass, and density.						I	D	D	D	M
7. Differentiate between mass and weight.			I	D	D	D	D	M	E	E
8. Demonstrate Catholic ethical, moral values in the utilization of scientific information.	I	D	D	D	D	D	D	D	D	D
9. Compare sets of related data to identify credible inferences and their Catholic moral implications.								I	D	D
10. Integrate Catholic values in the application of the scientific inquiry process.	I	D	D	D	D	D	D	D	D	D

LEGEND: I = Introduce D = Develop M = Master E = Enrich

SCIENCE

THE NATURE OF MATTER

The student will be able to...

OBJECTIVES - Standard 2	PreK	K	1	2	3	4	5	6	7	8
The student understands the basic principles of atomic theory.										
1. Describe atoms, molecules, and elements.						I	D	M	E	E
2. Identify mixtures and compounds.						I	D	D	D	M
3. Compare/Contrast physical and chemical changes using science process skills.					I	D	D	D	D	M
4. Describe/Use the periodic table.						I	D	D	D	D
5. Write and explain chemical formulas and reactions.							I	D	D	D
6. Compare/Contrast uses of acids and bases.								I	D	D
7. Use proper laboratory and safety techniques.		I	D	D	D	D	D	M	E	E
8. Compare/Contrast chemical and nuclear reactions.								I	D	D
9. Describe the uses of chemical and nuclear changes in society.								I	D	D
10. Use technology to describe, classify, and compare matter.	I	D	D	D	D	D	D	D	D	D
11. Use a multimedia approach to develop subject matter.	I	D	D	D	D	D	D	D	D	D

LEGEND: I = Introduce D = Develop M = Master E = Enrich

SCIENCE

ENERGY

The student will be able to...

OBJECTIVES - Standard 1	PreK	K	1	2	3	4	5	6	7	8
The student recognizes that energy may be changed in form with varying efficiency.										
1. Identify different forms of energy.			I	D	D	M	E	E	E	E
2. Discuss the uses of different forms of energy.			I	D	D	D	M	E	E	E
3. Explain/Demonstrate various forms of energy:										
Magnetism	I	D	D	D	D	D	D	M	E	E
Electromagnetic						I	D	D	D	D
Sound	I	D	D	D	D	M	E	E	E	E
Electrical				I	D	D	D	D	D	D
Thermal				I	D	D	D	D	D	D
Potential							I	D	D	D
Kinetic							I	D	D	D
Nuclear							I	D	D	D
Chemical							I	D	D	D
4. Demonstrate the law of conservation of energy.						I	D	D	D	M
5. Discuss the impact and moral implications of depleting natural resources.	I	D	D	D	D	D	D	E	E	E
6. Integrate Catholic values with concepts and use of science and technology.			I	D	D	D	D	D	D	D
7. Use a multimedia approach to develop subject matter.	I	D	D	D	D	D	D	D	D	D

LEGEND: I = Introduce D = Develop M = Master E = Enrich

SCIENCE

FORCE AND MOTION

The student will be able to...

OBJECTIVES - Standard 1	PreK	K	1	2	3	4	5	6	7	8
The student understands that types of motion may be described, measured, and predicted.										
1. Compare/Contrast force and motion.			I	D	D	D	D	M	E	E
2. Describe/Demonstrate Newton’s Law of Motion.							I	D	D	M
3. Compare/Contrast speed, velocity, and acceleration.							I	D	D	M
4. Describe the relationship between kinetic and potential energy.							I	D	D	M
5. Describe inertia.							I	D	D	M
6. Demonstrate the conservation of momentum.							I	D	D	M
7. Describe characteristics of wave source and motion.						I	D	D	D	M
8. Explain how vibrations generate waves that travel away from the source.				I	D	M	E	E	E	E
9. Relate the production of a new product or machine that consumes resources to Catholic conservation and stewardship values.	I	D	D	D	D	D	D	D	D	D
10. Identify the relationship between the roles of science, technology, and Catholic ethics in the global community.			I	D	D	D	D	D	D	D
11. Use a multimedia approach to develop subject matter.	I	D	D	D	D	D	D	D	D	D
12. Explain and show the ways in which net force can act on an object.								I	D	M

LEGEND: I = Introduce D = Develop M = Master E = Enrich

SCIENCE

FORCE AND MOTION

The student will be able to...

OBJECTIVES - Standard 2	PreK	K	1	2	3	4	5	6	7	8
The student understands that the types of force that act on an object and the effect of that force can be described, measured, and predicted.										
1. Explain pressure and buoyancy.	I	D	D	D	D	D	D	D	D	M
2. Recognize that forces of gravity, electricity, and magnetism operate simple machines.					I	D	D	D	D	D
3. Know common contact forces, i.e., friction, tension, and buoyancy.		I	D	D	D	D	D	D	D	M
4. Know that the more massive an object is the less effect a given force has on that object.					I	D	D	M	E	E
5. Know that gravity is a universal force that every mass exerts on every other mass.			I	D	D	D	D	D	D	M
6. Calculate/Demonstrate speed, velocity, and acceleration.								I	D	M
7. Identify fluid force.								I	D	D
8. Know that many forces act at a distance.			I	D	D	D	D	D	D	D

LEGEND: I = Introduce D = Develop M = Master E = Enrich

SCIENCE

PROCESSES THAT SHAPE THE EARTH

The student will be able to...

OBJECTIVES - Standard 1	PreK	K	1	2	3	4	5	6	7	8
The student recognizes that processes in the lithosphere, atmosphere, hydrosphere, and biosphere interact to shape the earth.										
1. Define the structure of the earth.	I	D	D	D	M	E	E	E	E	E
2. Identify and define materials that make up the earth's solid crust.					I	D	D	D	D	M
3. Know that the earth's surface is in constant change due to various forces.				I	D	M	E	E	E	E
4. Compare/Contrast and identify rock types.					I	D	D	M	E	E
5. Compare/Contrast agents of erosion/decomposition and their effects.					I	D	D	M	E	E
6. Describe/Explain continental drift and plate tectonics.							I	D	D	M
7. Describe/Contrast water features of the earth (salt versus fresh).			I	D	D	M	E	E	E	E
8. Define gravitational influences of the moon (tides).						I	D	D	D	M
9. Explain the composition, structure, and atmospheric movement related to weather.	I	D	D	D	D	D	D	M	E	E
10. Define the water cycle.				I	D	D	D	M	E	E
11. Define the atmospheric, water, and soil interaction with each other.			I	D	D	D	D	D	D	M
12. Explain the causes/effects of quakes, volcanic action and geysers.			I	D	D	D	D	D	D	M
13. Explain earth zones and various climates.	I	D	D	D	D	D	D	D	D	M
14. Identify the Greenhouse Effect and the process that creates it.					I	D	D	D	D	M
15. Identify the physical and chemical processes of weathering.						I	D	D	D	M

LEGEND: I = Introduce

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PROCESSES THAT SHAPE THE EARTH

The student will be able to...

OBJECTIVES - Standard 1 (con't)	PreK	K	1	2	3	4	5	6	7	8
The student recognizes that processes in the lithosphere, atmosphere, hydrosphere, and biosphere interact to shape the earth.										
16. Relate earth's history from its beginning in relationship to land masses, rock formation, climate, atmosphere, and topographical maps.			I	D	D	D	D	D	D	D
17. Explain mapping and map projections (social studies).			I	D	D	D	D	D	D	D
18. Demonstrate stewardship impacted with Catholic values in the care of the local and global environment.	I	D	D	D	D	D	D	D	D	D
19. Examine adaptations brought about by evolution in light of Catholic values.				I	D	D	D	D	D	D
20. Discuss the biblical story of creation in relation to the evolutionary theory.				I	D	D	D	D	D	D
21. Compare the theory of evolution with Catholic teaching about the origin of human beings.				I	D	D	D	D	D	D
22. Use a multimedia approach to develop subject matter.	I	D	D	D	D	D	D	D	D	D
23. Understand concepts of time and size relating to the interaction of earth's processes.								I	D	D

LEGEND: I = Introduce D = Develop M = Master E = Enrich

SCIENCE

PROCESSES THAT SHAPE THE EARTH

The student will be able to...

OBJECTIVES - Standard 2	PreK	K	1	2	3	4	5	6	7	8
The student understands the need for protection of the natural systems on earth.										
1. Understand that people influence the quality of life of those around them.	I	D	D	D	D	M	E	E	E	E
2. Identify recycling as a way to protect the environment.	I	D	D	D	D	M	E	E	E	E
3. Define human activity as a positive and negative consequence of human action on the earth's system.	I	D	D	D	D	M	E	E	E	E
4. Assess population effects upon land, water, and atmospheric aspects of the planet from the perspectives of stewardship and conservation.	I	D	D	D	D	D	D	D	D	D
5. Assess the impact of human population on earth's natural resources and Catholic moral responsibilities.	I	D	D	D	D	D	D	D	D	D
6. Recognize the range of time over which natural events occur (e.g., lightning in seconds, mountains form over many years).								I	D	D
7. Recognize currently accepted scientific theories regarding the origin of earth and life.								I	D	D
8. Relate scientific theories regarding the origin of earth and life to the teachings of the Catholic Church.								I	D	D
9. Describe how earth's atmosphere, hydrosphere and lithosphere have changed over time due to geomorphic, chemical and biological action.								I	D	D
10. Recognize processes that prevent or cause erosion over time.								I	D	D
11. Recognize fossil formation in sedimentary rock.								I	D	D
12. Infer characteristics and behaviors of creatures of prehistoric life based on fossil evidence and their resemblance to existing species.								I	D	D

LEGEND: I = Introduce

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SCIENCE

EARTH AND SPACE

The student will be able to...

OBJECTIVES - Standard 1	PreK	K	1	2	3	4	5	6	7	8
The student understands the interaction and organization in the Solar System and the universe and how this affects life on Earth.										
1. Discuss/Demonstrate day/night and the seasons.	I	D	D	D	D	D	D	M	E	E
2. Define comets, stars, meteors, planetary satellites, and constellations.	I	D	D	D	D	D	M	E	E	E
3. Name/Describe the planets and solar system.		I	D	D	D	D	M	E	E	E
4. Define the phases of the moon.			I	D	M	E	E	E	E	E
5. Explain the gravitational influences of the moon.						I	D	D	D	M
6. Explain/demonstrate the movements of the earth (rotation, revolution, or axis).			I	D	D	D	D	M	E	E
7. Define/Discuss the function of the sun (energy).				I	D	M	E	E	E	E
8. Describe the positions of the earth, moon and sun during solar and lunar eclipses.								I	D	D
9. Recognize that our sun is an average star and is one of many stars in our galaxy.								I	D	D
10. Recognize the relative sizes of planets, sun, solar system, galaxy and the universe.								I	D	D
11. Identify the relationship between tides on earth and the positions of moon, sun, and earth.								I	D	D
12. Explain the impact of weather on human activities, property and environment.								I	D	D

LEGEND: I = Introduce D = Develop M = Master E = Enrich

SCIENCE

EARTH AND SPACE

The student will be able to...

OBJECTIVES - Standard 2	PreK	K	1	2	3	4	5	6	7	8
The student recognizes the vastness of the universe and the Earth's place in it.										
1. Define black holes, galaxies, and quasars.								I	D	M
2. Describe the different types of galaxies.								I	D	M
3. Recognize that other galaxies appear to have the same elements, faces, and forms of energy found in our solar system.								I	D	M
4. Discuss/Demonstrate the tools used by astronomers.			I	D	D	D	D	M	E	E
5. Discuss the evolutionary theory of the universe as it relates to the Catholic teaching of creation.				I	D	D	D	D	D	D
6. Compare cultural myths in astronomy with evolutionary theories.							I	D	D	D
7. Use a multimedia approach to develop subject matter.								I	D	D

LEGEND: I = Introduce D = Develop M = Master E = Enrich

SCIENCE

PROCESSES OF LIFE

The student will be able to...

OBJECTIVES - Standard 1	PreK	K	1	2	3	4	5	6	7	8
The student describes patterns of structure and function in living things.										
1. Identify/Describe the characteristics of living things.	I	D	D	D	D	D	D	D	M	E
2. Define/Demonstrate the needs of living things.	I	D	D	D	D	D	D	D	M	E
3. Distinguish between living and non-living things.	I	D	D	D	D	M	E	E	E	E
4. Observe/Describe the growth of plants and animals.	I	D	D	D	D	D	M	E	E	E
5. Know the structure and function of plant and animal parts.		I	D	D	D	D	D	D	M	E
6. Know the structural differences of plants and animals.			I	D	D	M	E	E	E	E
7. Understand that offspring comes from similar parents.		I	D	D	M	E	E	E	E	E
8. Define/Demonstrate biodiversity.			I	D	D	D	M	E	E	E
9. Define/Demonstrate habitats of plants and animals.	I	D	D	D	M	E	E	E	E	E
10. Identify the human body systems.		I	D	D	D	D	D	D	M	E
11. Describe ecosystems - food webs/chains.		I	D	D	D	M	E	E	E	E
12. Understand/Describe the concept of heredity.			I	D	D	D	D	D	D	M
13. Identify/Describe the major kingdoms.	I	D	D	D	D	D	M	E	E	E
14. Demonstrate classification systems.	I	D	D	D	D	D	D	M	E	E
15. Understand/Describe the structure and function of various groups of organisms.				I	D	D	D	D	M	E
16. Define/Observe stimulus and response.				I	D	D	D	M	E	E
17. Identify/Describe reproduction of plants and animals.					I	D	D	D	D	M
18. Identify/Describe adaptations and survival strategies of plants and animals.	I	D	D	D	D	D	M	E	E	E
19. Understand the concept of the earth's history.			I	D	D	D	D	D	D	M
20. Identify fossils from ancient life.				I	D	D	D	D	D	M

LEGEND: I = Introduce

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SCIENCE

PROCESSES OF LIFE

The student will be able to...

OBJECTIVES - Standard 1 (cont'd)	PreK	K	1	2	3	4	5	6	7	8
The student describes patterns of structure and function in living things.										
21. Identify/Describe flowering plant life cycles.			I	D	D	M	E	E	E	E
22. Define cells as a unit of life.					I	D	D	D	M	E
23. Observe/Describe animal movement and behavior.	I	D	D	D	D	M	E	E	E	E
24. Identify/Describe animal life cycles.			I	D	D	M	E	E	E	E
25. Relate concepts of heredity and reproduction to Catholic teaching.						I	D	D	D	D
26. Discuss biblical story of creation in relation to evolutionary theory.				I	D	D	D	D	D	D
27. Compare the theory of evolution with Catholic teaching about the origin of human beings.				I	D	D	D	D	D	D
28. Know the levels of structural organization for function in living things.		I	D	D	D	D	D	M	E	E

LEGEND: I = Introduce D = Develop M = Master E = Enrich

SCIENCE

PROCESSES OF LIFE

The student will be able to...

OBJECTIVES - Standard 2	PreK	K	1	2	3	4	5	6	7	8
The student understands the process and importance of genetic diversity.										
1. Summarize the cell theory.					I	D	D	D	M	E
2. Explain cell structure and function.						I	D	D	M	E
3. Understand cell reproduction (mitosis and meiosis).							I	D	D	D
4. Understand/Describe cell processes.							I	D	D	D
5. Compare/Contrast endotherms (warm-blooded) and ectotherms (cold-blooded) animals.		I	D	D	M	E	E	E	E	E
6. Analyze genetic engineering and its morality as implied by Catholic teaching.								I	D	D
7. Compare/Describe ancient life from fossil records with modern life forms and discuss biblical implications.				I	D	D	D	D	D	D
8. Examine adaptations brought about by evolution in light of Catholic values.				I	D	D	D	D	D	D
9. Understand and be able to explain the Church's teaching on stem cell research.								I	D	D

LEGEND: I = Introduce D = Develop M = Master E = Enrich

SCIENCE

HOW LIVING THINGS INTERACT WITH THEIR ENVIRONMENT

The student will be able to...

OBJECTIVES - Standard 1	PreK	K	1	2	3	4	5	6	7	8
The student understands the competitive, interdependent, cyclic nature of living things in the environment.										
1. Identify/Describe the interactions of living things.	I	D	D	D	D	D	D	D	M	E
2. Understand the interdependence of living things.	I	D	D	D	D	D	D	D	M	E
3. Discuss/Demonstrate biomes and physical environments.		I	D	D	D	D	D	M	E	E
4. Discuss/Analyze human impact on the environment.	I	D	D	D	D	D	D	M	E	E
5. Compare/Contrast the concepts of predator and prey.		I	D	D	M	E	E	E	E	E
6. Understand/Describe the process of photosynthesis.			I	D	D	D	D	D	M	E
7. Observe/Describe the effect of decomposers on life cycles.		I	D	D	D	D	D	M	E	E
8. Understand the interaction between biotic and abiotic factors.				I	D	D	D	D	M	E
9. Identify natural resources.			I	D	M	E	E	E	E	E
10. Compare/Contrast renewable and non-renewable resources.	I	D	D	D	M	E	E	E	E	E
11. Identify concepts and causes of endangered and extinct species.			I	D	D	D	M	E	E	E
12. Define/Describe viruses, bacteria, and fungi.				I	D	D	D	D	M	E
13. Recognize the criteria for classification.			I	D	D	D	M	E	E	E
14. Define conservation with examples.	I	D	D	D	D	D	D	M	E	E

LEGEND: I = Introduce D = Develop M = Master E = Enrich

SCIENCE

HOW LIVING THINGS INTERACT WITH THEIR ENVIRONMENT

The student will be able to...

OBJECTIVES - Standard 2	PreK	K	1	2	3	4	5	6	7	8
The student understands the consequences of using limited natural resources.										
1. Assess the effect of population upon our world from the perspective of stewardship and moral responsibility.	I	D	D	D	D	D	D	D	D	D
2. Relate the development of a new product with regard to conservation and stewardship.		I	D	D	D	D	D	M	E	E
3. Discuss the impact and moral implications of depleting natural resources.	I	D	D	D	D	M	E	E	E	E
4. Identify/Describe the characteristics of the Florida biome.		I	D	D	D	D	D	D	D	D
5. Discuss the impact of growth and development on the Florida biome.		I	D	D	D	D	D	D	D	D
6. Understand and explain the Church’s social teachings as they relate to care of the environment.						I	D	D	D	D

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SCIENCE

THE NATURE OF SCIENCE

The student will be able to...

OBJECTIVES - Standard 1	PreK	K	1	2	3	4	5	6	7	8
The student uses the scientific processes and habits of mind to solve problems.										
1. Understand the scientific process.			I	D	D	D	D	M	E	E
2. Use the senses to make observations.	I	D	D	D	M	E	E	E	E	E
3. Compare/Contrast quantitative and qualitative observations.	I	D	D	D	D	D	D	M	E	E
4. Understand the importance of repetition and accuracy in experimenting.		I	D	D	D	D	D	M	E	E
5. Collect, record and analyze data appropriately.		I	D	D	D	D	D	D	D	D
6. Demonstrate the ability to work cooperatively.	I	D	D	D	D	D	M	E	E	E
7. Make inferences and draw conclusions.	I	D	D	D	D	D	D	D	D	M
8. Design/Redesign an experiment with appropriate variables.		I	D	D	D	D	D	D	D	M
9. Understand the concepts of hypothesis, theory, and laws.							I	D	D	M
10. Show competence in safe use of appropriate scientific instruments.		I	D	D	D	D	D	M	E	E
11. Understand/Use metric, standard and non-standard measurements.	I	D	D	D	D	D	D	D	D	M
12. Understand/Interpret patterns of natural events.		I	D	D	D	D	D	M	E	E
13. Compare/Contrast data.	I	D	D	D	D	D	D	M	E	E
14. Design/Construct a model.		I	D	D	D	M	E	E	E	E

LEGEND: I = Introduce

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SCIENCE

THE NATURE OF SCIENCE

The student will be able to...

OBJECTIVES - Standard 3	PreK	K	1	2	3	4	5	6	7	8
The student understands that science, technology, and society are interwoven and interdependent.										
1. Recognize the concept of cause and effect.	I	D	D	D	D	D	M	E	E	E
2. Utilize technology in scientific problem solving.	I	D	D	D	D	D	D	M	E	E
3. Explain how scientists and their discoveries have advanced human understanding of science and technology.		I	D	D	D	D	D	M	E	E
4. Present findings of an experiment.			I	D	D	D	D	M	E	E
5. Demonstrate the ability to build on prior knowledge.	I	D	D	D	M	E	E	E	E	E
6. Understand the importance of animal care in research.		I	D	D	D	D	M	E	E	E
7. Understand the importance of informed consent in human experiments.		I	D	D	D	D	D	M	E	E
8. Demonstrate the use of science terminology.	I	D	D	D	D	D	D	D	D	D
9. Understand the role of science, technology, and Catholic ethics and their moral implications in the world.			I	D	D	D	D	D	D	D
10. Understand the ethical importance of making scientific knowledge accessible to the public.			I	D	D	D	D	D	D	D

LEGEND: I = Introduce D = Develop M = Master E = Enrich