High School Physics

Guidelines for Human Sexuality Education

Based on the understanding that human sexuality education is a right and responsibility of parents, teachers whose curricular material includes human sexuality content are obligated to work together with parents to ensure that parents know what is being taught to their children and how it is being covered.

If topics in High School Physics address human sexuality education, please inform the parents of your students with the topic and timeline.

Please consult with your principal and/or pastor to determine the local directives on parental collaboration that are aligned with directives outlined in the May 4, 2011 letter from Bishop William Patrick Callahan. A copy of that letter can be found in the front pocket of this curriculum binder.

Grade: High School **Subject:** Physics

Standard A: Science Connections that reveal God's creation

DIOCESAN REQUIREMENTS
CONCEPTS, SKILLS, & CATHOLIC FAITH CONNECTIONS
1. Evaluate short and long term consequences of the advancement of technology (nano technology, electromagnetic, waves, energy).
2. Describe the different forms of energy and how energy is transformed.
3. Evaluate the impact of physics principles on social and environmental issues such as power generation and electromagnetic fields.

LOCAL LEVEL SCHOOL ELEMENTS					
Text Alignment	**Quarter / Date Taught**				
	1	**2**	**3**	**4**	**Assessment**

RELIGIOUS RESOURCES	COMMON CORE STANDARDS
DRC: Respect for Life III. Second Tablet of the Law I A We must honor & obey civil authority **DRC: Social Teaching IV. Second Tablet of the Law II A** Respect all things, including private ownership **DRC: Social Teaching IV. Second Tablet of the Law II B** Promote the common good **DRC: Christian Morality – Utility** Technology must serve the common good	**Physical Science** Core Idea 3: Transfers of energy within and between systems never change the total amount of energy, but energy tends to become more dispersed; energy availability regulates what can occur in any process. A. Descriptions of energy B. Energy for life and practical use - The special role of food and fuel C. Relationship between energy and forces Core Idea 4: Our understanding of wave properties, together with appropriate instrumentation allows us to use waves, particularly electromagnetic and sound waves, to investigate nature on all scales, far beyond our direct sense perception. A. Wave properties B. Electromagnetic radiation C. Direction and interpretation, instrumentation **Engineering and Technology** Core Idea 4: In today's modern world everyone makes technological decisions that affect or are affected by technology on a daily basis.; Consequently, it is essential for all citizens to understand the risks and responsibilities that accompany such decisions. A. Interactions of technology and society B. Interactions of technology and environment C. Analyzing issues involving technology and society

DRC: Diocesan Religion Curriculum **CCC: Catechism of the Catholic Church**

Grade: High School **Subject:** Physics

Standard B: The Nature of Science as created by God and discovered by man

DIOCESAN REQUIREMENTS
CONCEPTS, SKILLS, & CATHOLIC FAITH CONNECTIONS
1. Understand that although science can lead to new possibilities, the morals and ethical implications must be evaluated according to God's law.
2. Describe how knowledge of energy, forces, and the interaction between them helps us better understand the natural world.
3. Give examples of basic and applied research that has impacted our understanding and use of energy and forces (for example, research on electromagnetism eventually led to computer technology).
4. Understand how cultural views affect the knowledge and use of various forms of energy.

LOCAL LEVEL SCHOOL ELEMENTS						
Text Alignment	**Quarter / Date Taught**					
	1	**2**	**3**	**4**	**Assessment**	

RELIGIOUS RESOURCES	COMMON CORE STANDARDS
DRC: Christian Morality IV – Moral Judgment A Conscience depends on the moral law **DRC: Christian Morality IV – Moral Judgment** B The components of moral choice are the object, intention, and circumstances **DRC: Christian Morality IV – Moral Judgment C** The ends do not justify the means. **CCC:** 50 God has revealed Himself through Jesus **CCC:** 159 There is no discrepancy between faith and reason **CCC:** 338 God created everything **CCC:** 2293-2294 Scientific research must benefit all **CCC:** 2464-2467 Man is obligated to tell the truth *Fides et Ratio* – Pope John Paul II	**Physical Science** Core Idea 3: Transfers of energy within and between systems never changes the total amount of energy, but energy tends to become more dispersed; energy availability regulates what can occur in any process. A. Descriptions of energy B. Energy for life and practical use. The special role of food and fuel C. Relationship between energy and forces **Engineering and Technology** Core Idea 1: The study of the designed world is the study of designed systems, processes, materials, and products and of the technologies and the scientific principles by which they function. A. Products, processes, and systems B. Nature of technology C. Using tools and materials Core Idea 4: In today's modern world everyone makes technological decisions that affect or are affected by technology on a daily basis. Consequently, it is essential for all citizens to understand the risks and responsibilities that accompany such decisions. A. Interactions of technology and society B. Interactions of technology and environment C. Analyzing issues involving technology and society

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Grade: High School **Subject:** Physics

Standard C: Science Inquiry that reflects God's created order

DIOCESAN REQUIREMENTS	LOCAL LEVEL SCHOOL ELEMENTS					
CONCEPTS, SKILLS, & CATHOLIC FAITH CONNECTIONS	**Text Alignment**	**Quarter / Date Taught**				
		1	**2**	**3**	**4**	**Assessment**
1 Formulate scientific questions based on current social issues, scientific literature, and observations of phenomena.						
2 Develop and articulate hypotheses based on theory and past experience.						
3. Recognize the best experimental approach to investigate a question (direct observation, controlled, computer modeling).						
4. Design experiments to test hypotheses that use responsible, ethical, and safe procedures.						
5. Demonstrate appropriate experimental design through the proper use of independent, dependent, and control variables.						
6. Use scientific tools and units of measurement competently and precisely.						
7. Collect, analyze, and present data through text, tables, and graphs.						
8. Draw conclusions from investigations and determine applications for further directions for research.						
9. Replace inaccurate models, explain, and cite evidence supporting new hypotheses.						
10. Respectfully critique own work and the work of others (classmates and published works) to evaluate scientific reasoning, experimental design and methods, and the validity of conclusions.						

RELIGIOUS RESOURCES	COMMON CORE STANDARDS
CCC: 2292 2296 Scientific research must serve the common good – be truthful – retain the dignity of the human person **National Catholic Bioethics Center** http://www.ncbcenter.org/NetCommunity// Ethics **United States Catholic Conference of Bishops (USCCB)** http://www.usccb.org/ life issues and social justice Diocesan Virtue Program – Fortitude	**Engineering and Technology** Core Idea 2: Engineering design is a creative and iterative process for identifying and solving problems in the face of constraints. A. Defining and researching technological problems B. Generating and evaluating solutions C. Optimizing and making tradeoffs

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Grade: High School **Subject:** Physics

Standard D: Physical Science as created by God

DIOCESAN REQUIREMENTS CONCEPTS, SKILLS, & CATHOLIC FAITH CONNECTIONS
1. Identify transfers of energy and the different forms of energy.
2. Explain the atomic forces at work behind electricity and magnetism.
3. Describe nuclear fusion and fission reactions.
4. Compare the magnitude of electromagnetic forces and gravitational forces.
5. Explain the properties and behavior of waves in the electromagnetic spectrum.
6. Measure the energy in waves and describe how waves gain and lose energy.
7. Calculate the efficiency of work.
8. Use vectors to analyze and diagram forces (friction, gravity, etc.) and motion.
9. Analyze factors and calculate different types of motion (projectile, freefall, circular, and harmonic).
10. Integrate knowledge of the interactions of matter and energy to explain changes in materials, living things, the earth and stars.

LOCAL LEVEL SCHOOL ELEMENTS						
Text Alignment	Quarter / Date Taught					
	1	2	3	4	Assessment	

RELIGIOUS RESOURCES	COMMON CORE STANDARDS
National Catholic Bioethics Center http://www.ncbcenter.org/NetCommunity// Ethics **United States Catholic Conference of Bishops (USCCB)** http://www.usccb.org/ life issues and social justice	**Physical Science** Core Idea 1: macroscopic states and characteristic properties of matter depend on the type, arrangement, and motion of particles at the molecular and atomic scales. A. Atomic structure of matter B. Properties of matter Core Idea 3: Transfers of energy within and between systems never change the total amount of energy, but energy tends to become more dispersed; energy availability regulates what can occur in any process. A. Descriptions of energy B. Energy for life and practical use. The special role of food and fuel C. Relationship between energy and forces Core Idea 4: Our understanding of wave properties, together with appropriate instrumentation, allows us to use waves, particularly electromagnetic and sound waves, to investigate nature on all scales, far beyond our direct sense perception. A. Wave properties B. Electromagnetic radiation C. Direction and interpretation, instrumentation

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Grade: High School **Subject:** Physics

Standard E: Earth and Space Science as created by God

DIOCESAN REQUIREMENTS
CONCEPTS, SKILLS, & CATHOLIC FAITH CONNECTIONS
1. Describe internal and external energies affecting earth and space systems.
2. Identify energy and forces involved in the movement of matter.

LOCAL LEVEL SCHOOL ELEMENTS						
Text Alignment	**Quarter / Date Taught**				
	1	**2**	**3**	**4**	**Assessment**

RELIGIOUS RESOURCES	COMMON CORE STANDARDS
National Catholic Bioethics Center http://www.ncbcenter.org/NetCommunity// Ethics **United States Catholic Conference of Bishops (USCCB)** http://www.usccb.org/ life issues and social justice	**Earth and Space Science** Core Idea 1: Humans are a small part of a vast Universe; planet Earth is part of the Solar System which is aprt of the Milky Way galaxy, which is one of hundreds of billions of galaxies in the Universe. A. The Universe B. Gravity, energy, and matter in the Universe C. Earth and the Solar System **Physical Science** Core Idea 3: Transfers of energy within and between systems never change the total amount of energy, but energy tends to become more dispersed; energy availability regulates what can occur in any process. A. Descriptions of energy B. Energy for life and practical use. The special role of food and fuel C. Relationship between energy and forces

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Grade: High School **Subject:** Physics

Standard F: Life and Environmental Science as created by God

DIOCESAN REQUIREMENTS
CONCEPTS, SKILLS, & CATHOLIC FAITH CONNECTIONS
NOT APPLICABLE

LOCAL LEVEL SCHOOL ELEMENTS					
Text Alignment	**Quarter / Date Taught**				
	1	**2**	**3**	**4**	**Assessment**

RELIGIOUS RESOURCES	COMMON CORE STANDARDS

DRC: Diocesan Religion Curriculum **CCC: Catechism of the Catholic Church**

Grade: High School **Subject:** Physics

Standard G: Science Applications that reflect God's goodness

DIOCESAN REQUIREMENTS	LOCAL LEVEL SCHOOL ELEMENTS					
CONCEPTS, SKILLS, & CATHOLIC FAITH CONNECTIONS	**Text Alignment**	**Quarter / Date Taught**				
		1	**2**	**3**	**4**	**Assessment**
1. Demonstrate an understanding of applications of physics to real-life issues.						
2. Analyze the impact (cost, benefit, effects) of past and current physics and technological innovations on individuals and society.						
3. Evaluate data (considering sources of information), validity, and short & long term implications of solutions to a problem and advocate for the most reasonable solution(s).						
4. Demonstrate awareness and understanding of current developments in physics and related fields.						
5. Explore careers in science and technology.						

RELIGIOUS RESOURCES	COMMON CORE STANDARDS
National Catholic Bioethics Center http://www.ncbcenter.org/NetCommunity// Ethics **United States Catholic Conference of Bishops (USCCB)** http://www.usccb.org/ life issues and social justice	**Engineering and Technology** Core Idea 2: Engineering design is a creative and iterative process for identifying and solving problems in the face of constraints. A. Defining and researching technological problems B. Generating and evaluating solutions C. Optimizing and making tradeoffs Core Idea 3: People are surrounded and supported by technological systems. Effectively using and improving these systems is essential for long-term survival and prosperity. A. Identifying and modeling technological systems B. Life cycles and maintenance of technological systems C. Control and feedback

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Grade: High School **Subject:** Physics

Standard H: Personal, Social, and Moral Aspects of Science

DIOCESAN REQUIREMENTS CONCEPTS, SKILLS, & CATHOLIC FAITH CONNECTIONS
1. Show how science influences personal and social perspectives.
2. Show how non-scientific perspectives (social values, ethics, beliefs, and timeframes) influence policy decisions related to science.
3. Investigate current proposals or plans in resource management or waste disposal and evaluate the costs, benefits, risks, and consequences to the environment and local communities (in particular nuclear waste).
4. Propose and evaluate (using models and/or explanations) scientific and technological solutions to a problem.
5. Recognize and explore moral implications and issues in scientific inquiry and technology.
6. Promote God's commandments as expressed through Catholic virtues and moral teaching – especially respect for life, the sanctity of human life, and stewardship.

LOCAL LEVEL SCHOOL ELEMENTS						
Text Alignment	Quarter / Date Taught					
	1	2	3	4	Assessment	

RELIGIOUS RESOURCES	COMMON CORE STANDARDS
CCC: 2292-2294 Respect the dignity of the human person – be truthful **National Catholic Bioethics Center** http://www.ncbcenter.org/NetCommunity// Ethics **United States Catholic Conference of Bishops (USCCB)** http://www.usccb.org/ life issues and social justice	**Engineering and Technology** Core Idea 2: Engineering design is a creative and iterative process for identifying and solving problems in the face of constraints. A. Defining and researching technological problems B. Generating and evaluating solutions C. Optimizing and making tradeoffs Core Idea 3: People are surrounded and supported by technological systems. Effectively using and improving these systems is essential for long-term survival and prosperity. A. Identifying and modeling technological systems B. Life cycles and maintenance of technological systems C. Control and feedback Core Idea 4: In today's modern world everyone makes technological decisions that affect or are affected by technology on a daily basis. Consequently, it is essential for all citizens to understand the risks and responsibilities that accompany such decisions. A. Interactions of technology and society B. Interactions of technology and environment C. Analyzing issues involving technology and society

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