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.

Standard A: Science Connections that reveal God's creation

DIOCESAN REQUIREMENTS		ſ	LOCAL	LE	VEL	SCI	HOO	L ELEMENTS
CONCEPTS, SKILLS,		Ī	Text			Quar	ter / D	Date Taught
& CATHOLIC FAITH CONNECTIONS			Alignment	1	2	3	4	Assessment
1. Evaluate short and long term consequences of the advancement	nt of	Ī						
technology (nano technology, electromagnetic, waves, energy).							
2. Describe the different forms of energy and how energy is tran	sformed.							
3. Evaluate the impact of physics principles on social and enviro	nmental issues							
such as power generation and electromagnetic fields.								
RELIGIOUS RESOURCES			COMMON	I CO	RE ST	ΓAND	ARDS	5
DRC: Respect for Life III. Second Tablet of the Law I A	Physical Science							
We must honor & obey civil authority	Core Idea 3: Trans	sfe	ers of energy w	vithin	and b	etween	n syste	ms never change the
DRC: Social Teaching IV. Second Tablet of the Law II A	total amount of end	erg	gy, but energy	tend	s to be	ecome	more of	dispersed; energy
Respect all things, including private ownership	availability regulat	ites	s what can occ	ur in	any p	rocess.	•	
DRC: Social Teaching IV. Second Tablet of the Law II B	B Energy for 1	is (lif.	e and practica	1 1150	- The	snecia	l role c	of food and fuel
Promote the common good	C. Relationship	p l	between energ	y and	l force	speera	11010	
DRC: Christian Morality – Utility Technology must serve	Core Idea 4: Our u	inc	derstanding of	wave	e prop	erties,	togeth	er with appropriate
the common good	instrumentation all	lov	ws us to use w	vaves,	partic	cularly	electro	omagnetic and sound
	waves, to investiga	ate	e nature on all	scale	s, far l	beyond	d our d	irect sense perception.
	A. Wave prope	ert	1es					
	B. Electromag	gne nd	interpretation	inct	rumen	tation		
	Engineering and	Па	echnology	i, 1115t	runnen	lation		
	Core Idea 4: In tod	day	y's modern wo	orld e	veryoi	ne mak	kes tecl	hnological decisions
	that affect or are at	ffe	ected by techn	ology	on a	daily b	oasis.;	Consequently, it is
	essential for all cit	tize	ens to underst	and tl	ne risk	s and a	respon	sibilities that
	accompany such d	lec	cisions.	1	•			
	A. Interactions	s o	t technology a	and so	ociety	mont		
	C Analyzing i	s u ice	ues involving	techr		and e	ociety	
DRC: Diocesan Religion Curriculum	CCC: Catechism	0f	f the Catholi	c Ch	urch	unu s	ociciy	

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

DIOCESAN REQUIREMENTS		LOCAL LEVEL SCHOOL ELEMEN			L ELEMENTS		
CONCEPTS, SKILLS,		Text			Quar	ter / I	Date Taught
& CATHOLIC FAITH CONNECTIONS		Alignment	1	2	3	4	Assessment
1. Understand that although science can lead to new possibilities	s, the morals						
and ethical implications must be evaluated according to God'	s law.						
2. Describe how knowledge of energy, forces, and the interactio	n between them						
helps us better understand the natural world.							
3. Give examples of basic and applied research that has impacted	d our						
understanding and use of energy and forces (for example, res	earch on						
electromagnetism eventually led to computer technology).							
4. Understand how cultural views affect the knowledge and use	of various						
forms of energy.							
RELIGIOUS RESOURCES		СОММО	N CO	RE ST	ΓAND	ARDS	5
 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: Transfer amount of energy, but regulates what can oc A. Descriptions of B. Energy for lift C. Relationship I Engineering and Te Core Idea 1: The stud materials, and product they function. A. Products, product they function. B. Nature of tech C. Using tools an Core Idea 4: In today or are affected by tec citizens to understand A. Interactions o B. Interactions o C. Analyzing iss	rs of energy wit it energy tends to ccur in any proc of energy e and practical between energy chnology ly of the design cts and of the ten- cesses, and syst mology nd materials 's modern worl hnology on a da l the risks and r f technology and technology and technolog	hin and to beco ess. use. Th and fo ed wor chnolo ems d every illy base espons d socia d envi echnolo	d betwee ome mo ne spec orces d is th gies an yone m sis. Co sibilitie ety ronmer ogy and	een syst re disp ial role e study d the so akes te nseque s that a at <u>l societ</u>	of food of food of des cientific chnolog ntly, it ccompa	ever changes the total energy availability d and fuel igned systems, processes, c principles by which gical decisions that affect is essential for all any such decisions.

Subject: Physics

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

DIOCESAN REQUIREMENTS		LOCAL LEVEL SCHOOL ELEMEN			L ELEMENTS		
CONCEPTS, SKILLS,		Text			Quar	rter / I	Date Taught
& CATHOLIC FAITH CONNECTIONS		Alignment	1	2	3	4	Assessment
1 Formulate scientific questions based on current social issues, scie	entific literature,						
and observations of phenomena.							
2 Develop and articulate hypotheses based on theory and past expe	rience.						
3. Recognize the best experimental approach to investigate a questi- observation, controlled, computer modeling).	on (direct						
4. Design experiments to test hypotheses that use responsible, ethic procedures.	al, and safe						
5. Demonstrate appropriate experimental design through the proper independent, dependent, and control variables.	use of						
6. Use scientific tools and units of measurement competently and pr	recisely.						
7. Collect, analyze, and present data through text, tables, and graphs	5.						
8. Draw conclusions from investigations and determine applications directions for research.	s for further						
9. Replace inaccurate models, explain, and cite evidence supporting	g new hypotheses.						
10. Respectfully critique own work and the work of others (classmat	es and published						
works) to evaluate scientific reasoning, experimental design and	methods, and the						
validity of conclusions.							
RELIGIOUS RESOURCES		COMMON	COF	RE ST	ANDA	ARDS	
CCC: 2292 2296 Scientific research must serve the common good							
– be truthful – retain the dignity of the human person							
National Catholic Bioethics Center	Engineering and T	echnology					
http://www.ncbcenter.org/NetCommunity//	Core Idea 2: Engineering design is a creative and iterative process for					ive process for	
Ethics	identifying and solving			ne face	e of co	onstrai	ints.
United States Catholic Conference of Bisnops (USCCB)	A. Defining and researching technological problems				5		
life issues and social justice	B. Generating and evaluating solutions						
The issues and social justice	C. Optimizing and making			fs			
Diocesan Virtue Program – Fortitude		<u> </u>					

DRC: Diocesan Religion Curriculum

CCC: Catechism of the Catholic Church

Standard D:	Physical Science as created by God
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DIOCESAN REQUIREMENTS		LOCAI	LLE	VEI	SC	HOC	DL ELEMENTS
CONCEPTS, SKILLS,		Text			Quar	ter / I	Date Taught
& CATHOLIC FAITH CONNECTIONS		Alignment	1	2	3	4	Assessment
1. Identify transfers of energy and the different forms of energy.							
2. Explain the atomic forces at work behind electricity and magnetism	1.						
3. Describe nuclear fusion and fission reactions.							
4. Compare the magnitude of electromagnetic forces and gravitational	l forces.						
5. Explain the properties and behavior of waves in the electromagneti	c spectrum.						
6. Measure the energy in waves and describe how waves gain and los	e energy.						
7. Calculate the efficiency of work.							
8. Use vectors to analyze and diagram forces (friction, gravity, etc.) a	nd motion.						
9. Analyze factors and calculate different types of motion (projectile, and harmonic).	freefall, circular,						
10. Integrate knowledge of the interactions of matter and energy to exp	lain changes in						
materials, living things, the earth and stars.							
RELIGIOUS RESOURCES		COMMON	N CO	RE ST	ΓAND	ARDS	5
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	COMMON CORE STANDARDS 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						
DRC: Diocesan Religion Curriculum	CCC: Catechism o	of the Cathol	ic Cł	nurch			

Standard E:

DIOCESAN REQUIREMENTS		LOCAL LEVEL SCHOOL ELEMENTS							
CONCEPTS, SKILLS,		Text			Quar	ter / I	Date Taught		
& CATHOLIC FAITH CONNECTIONS		Alignment	1	2	3	4	Assessment		
1. Describe internal and external energies affecting earth and	space systems.								
2. Identify energy and forces involved in the movement of ma	atter.								
RELIGIOUS RESOURCES		COMMON	COF	RE ST	ANDA	ARDS			
	Earth and Space S	Science							
National Catholic Bioethics Center	Core Idea 1: Huma	ns are a small	part	of a v	ast Ui	nivers	e; planet Earth is part		
http://www.ncbcenter.org/NetCommunity//	of the Solar System	n which is aprt	of th	ne Mil	ky W	ay gal	axy, which is one of		
Ethics	hundreds of billion	s of galaxies i	n the	Univ	erse.				
	A. The Universe	e							
	B. Gravity, ener	gy, and matte	r in t	he Un	iverse	;			
United States Catholic Conference of Bishops (USCCB)	C. Earth and the	e Solar System	ı						
<u>http://www.usccb.org/</u> life issues and social justice	Physical Science								
The issues and social justice	Core Idea 3: Transf	fers of energy	with	in and	betw	een sy	stems never change		
	the total amount of	energy, but en	nergy	tends	s to be	ecome	more dispersed;		
	energy availability	regulates what	t can	occui	r in an	y pro	cess.		
	A. Descriptions	of energy							
	B. Energy for li	fe and practica	al use	e. The	speci	al role	e of food and fuel		
	C. Relationship	between energy	gy an	d for	ces				
DRC: Diocesan Religion Curriculum	CCC: Catechism	of the Cathol	ic Ch	urch					

Earth and Space Science as created by God

Subject: Physics

Standard F: Life and Environmental Science as created by God

DIOCESAN REQUIREMENTS	LOCAL LEVEL SCHOOL ELEMENTS								
CONCEPTS, SKILLS,		Text			Quarter / Date Taught				
& CATHOLIC FAITH CONNECTIONS		Alignment	1	2	3	4	Assessment		
NOT APPLICABLE									

RELIGIOUS RESOURCES	COMMON CORE STANDARDS
DRC: Diocesan Religion Curriculum	UCC: Catechism of the Catholic Church

Standard G: Science Applications that reflect God's goodness

DIOCESAN REQUIREMENTS	LOCAL LEVEL SCHOOL ELEMEN		L ELEMENTS				
CONCEPTS, SKILLS,		Text Quarter / Date Taught		Date Taught			
& CATHOLIC FAITH CONNECTIONS		Alignment	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
	Engineering and Technology
	Core Idea 2: Engineering design is a creative and iterative process for
National Catholic Bioethics Center	identifying and solving problems in the face of constraints.
http://www.ncbcenter.org/NetCommunity//	A. Defining and researching technological problems
Ethics	B. Generating and evaluating solutions
	C. Optimizing and making tradeoffs
United States Catholic Conference of Bishops (USCCB)	Core Idea 3: People are surrounded and supported by technological
http://www.usccb.org/	systems. Effectively using and improving these systems is essential for
life issues and social justice	long-term survival and prosperity.
	A. Identifying and modeling technological systems
	B. Life cycles and maintenance of technological systems
	C. Control and feedback
DRC: Diocesan Religion Curriculum	CCC: Catechism of the Catholic Church

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

DIOCESAN REQUIREMENTS		LOCAI	LE	VEI	SCI	HOO	L ELEMENTS
CONCEPTS, SKILLS,		Text			Quar	ter / I	Date Taught
& CATHOLIC FAITH CONNECTIONS		Alignment	1	2	3	4	Assessment
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 w	vaste disposal and						
evaluate the costs, benefits, risks, and consequences to the environment	nent 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 in technology	nquiry and						
6 Promote God's commandments as expressed through Catholic virtu	les and moral						
teaching – especially respect for life the sanctity of human life and	t stewardship						
<u>teaching – especially respect for file, the safetity of human file, and</u>	i stewardsnip.						
RELIGIOUS RESOURCES		COMMON	N CO	RE ST	ΓAND	ARDS	5
CCC: 2292-2294 Respect the dignity of the human person – be	Engineering and Te	chnology					
truthful	Core Idea 2: Enginee	ring design is a o	creativ	ve and	iterativ	e proce	ess for identifying and
	Solving problems in t	ne face of consti	raints.	ical pr	hlome		
National Catholic Bioethics Center	B. Generating and	d evaluating sol	utions	icai pro	JUICHIS		
http://www.ncbcenter.org/NetCommunity//	C. Optimizing an	nd making traded	offs				
Ethics	Core Idea 3: People a	re surrounded a	nd sup	ported	by tecl	hnologi	ical systems. Effectively
	using and improving	these systems is	essen	tial for	long-te	erm sur	rvival and prosperity.
	A. Identifying an	id modeling tech	nolog	ical sy	stems		
United States Catholic Conference of Bishops (USCCB)	B. Life cycles an	d maintenance of	of tech	nologi	cal syst	tems	
http://www.usccb.org/	Core Idea 4: In today	's modern world	ever	ione m	akes te	chnolo	gical decisions that affect
life issues and social justice	or are affected by tec	hnology on a dai	ilv bas	sis. Co	nseque	ntlv. it	is essential for all
	citizens to understand the risks and responsibilities that accompany such deci				any such decisions.		
A. Interactions of technology and society			1	•			
B. Interactions of			f technology and environment				
	C. Analyzing iss	ues involving te	chnolo	ogy and	l societ	y	
DRC: Diocesan Religion Curriculum	CCC: Catechism of	of the Catholi	ic Ch	urch			