



Catholic Schools

DIOCESE of DALLAS

Office of Catholic Schools  
3725 Blackburn Street  
Dallas, TX 75219  
[csodallas.org](http://csodallas.org)

# Science/Health & Wellness Curriculum Standards Diocese of Dallas



August 2012

Dear Catholic School Educators:

Peace and Joy!

It is with great pleasure that I approve the *Science/Health and Wellness Curriculum Standards* for grades 1-12. These standards are essential for students to achieve learning expectations. It is my hope that not only will schools implement these math standards and promote the advancement of the study of mathematics, but also educate our students by informing, forming, and transforming them with wonder and meaning of Christian faith.

You, the educators, must address academic standards through traditional and innovative methods, infused with an appreciation of Catholic doctrine, Catholic social teachings, and moral development. The mathematics curriculum standards affirm that:

Catholic schools educate diverse student bodies to form Catholic, person-centered learning communities; provide academic excellence through educational programs infused with Catholic doctrine and social teachings; serve and support society in the parish, civic, and global communities; graduate students who are critical thinkers, productive moral citizens, and spiritual leaders; and recognize and appreciate parents as the primary educators of their children.

We are grateful to the Archdiocese of Hartford, CT under the direction Mrs. Valerie Mara, Director of Curriculum Design, and her committee for their energy, creativity, and dedication to this document and for their willingness to allow us to implement these standards and adjust them to meet the needs of our schools in the Diocese of Dallas. Please embrace this initiative as an opportunity to provide quality Catholic education; and to be an integral part of the effort to promote the success of all Diocesan school students to excel in mathematics.

God bless you in your ministry of Catholic education.

Peace in Christ, Jesus,

Sister Dawn Achs, SSND  
Associate Superintendent of Catholic Schools

## Science Curriculum Rationale

The citizen of the twenty-first century must be scientifically literate. He/She must have a basic knowledge of science and its processes to appreciate the wonders of the universe, analyze the problems presented by life, and develop appropriate and morally responsible solutions to those problems.

He/She must have knowledge and understanding of the scientific concepts and processes required for personal decision making, participation in civic and cultural affairs and economic productivity (National Academy of Sciences, 1995).

### ***Students Who are Scientifically Literate:***

- Have the knowledge and understanding of scientific concepts and processes required for participation in a Digital Age society.
- Can ask, find or determine answers to questions derived from curiosity regarding everyday experiences.
- Have the ability to describe, explain and predict natural phenomena.
- Are able to read and understand articles about science in the popular press and to engage in social conversation about the validity of those conclusions.
- Can identify scientific issues underlying national and local decisions and express positions that are scientifically and technologically informed.
- Are able to evaluate the quality of scientific information on the basis of its source and the methods used to generate it.
- Have the capacity to pose and evaluate arguments based on evidence and to apply conclusions from such arguments appropriately.

### ***Changing Emphases***

The *National Science Education Standards* envision systemic changes in the study of science. The science content standards encompass the following changes in emphases:

#### **Less Emphasis On**

Knowing scientific facts and information

Studying subject matter disciplines (physical, life, earth sciences) for their own sake

Separating science knowledge and science process

Covering many science topics

Implementing inquiry as a set of processes

#### **More Emphasis On**

Understanding scientific concepts and developing abilities of inquiry

Learning subject matter disciplines in the context of inquiry, technology, science in personal and social perspectives, and history and nature of science

Integrating all aspects of science content

Studying a few fundamental science concepts

Implementing inquiry as instructional strategies, abilities and ideas to be learned

*Learning Point Associates/NCREL*



# Graduation Outcomes

- ✚ Students will live according to the Catholic social teachings of the Church.
  - ✚ Students will use effective communication skills.
  - ✚ Students will read, think, and listen critically.
- ✚ Students will be culturally inclusive and demonstrate a global awareness.
  - ✚ Students will engage in lifelong learning.
  - ✚ Students will solve problems effectively and justly.
  - ✚ Students will use technology for the betterment of society.
- ✚ Students will develop an appreciation for the beauty in the world around them through the fine arts.

## Science Outcomes

- ❖ Students will demonstrate an awareness of the universality of science.
- ❖ Students will solve problems.
- ❖ Students will exhibit behaviors that show respect for life.
- ❖ Students will discriminate between moral and immoral use of science in society and the world.
- ❖ Students will design and Conduct experiments using the scientific method technique.
- ❖ Students will evaluate information for accuracy and logical consistency and applicability.
- ❖ Students will design and construct physical, theoretical and mathematical models of natural phenomena.
- ❖ Students will critically evaluate the applicability of a particular model to reality.
- ❖ Students will demonstrate knowledge of fundamental concepts of life sciences and physical science.
- ❖ Students will recognize patterns and cycles in the natural world.
- ❖ Students will identify the roles of energy in biological, chemical and physical interaction.
- ❖ Students will construct and communicate a well-organized synthesis of facts and concepts to form and support a valid conclusion.
- ❖ Students will use scientific tools and technology properly and accurately.
- ❖ Students will describe the interdependence of organisms with each other and their environment.
- ❖ Students will demonstrate self-directed learning through questioning and independent research.

## How to Use This Document

The *Science/Health & Wellness Curriculum Standards* is designed to assist the teacher in the important work of helping young people of the 21<sup>st</sup> century gain a basic knowledge of the sciences and its processes to appreciate the wonder of the universe, analyze the problems presented by life, and develop appropriate and morally responsible solutions to those problems. Students will be able to celebrate the miracle of God's universe, to analyze critically the challenges of life, and to develop moral responses to questions, challenges and problems.

The strand of **health & wellness** is an integrated component of the whole science curriculum. As we move forward in the third millennium, the health and wellness curriculum addresses our students' importance and wellness in today's technological society. As Catholic school educators, we recognize that spiritual, physical, emotional, social, and academic growth and performance and good health practices are inextricably intertwined. Today, health education is as important as all other subjects we teach in our Catholic schools.

The *Science/Health & Wellness Curriculum Standards* are based on previous Diocesan curriculum guides, the State of Texas science content standards, the *National Science Education Standards*, and the *National Health Education Standards: Achieving Excellence*. The committee relied heavily on the language and concepts of the State of Texas' Science Framework, especially in the secondary section of these curriculum standards. Within these standards the teacher will find ample expression of the uniqueness of Catholic education. The health curriculum provides students with specific health and wellness related knowledge and skills, health-enhancing behaviors, and known health risks to avoid. The relationship of one's own health and that of family and friends is introduced early in the curriculum and developed through the middle school grades, exploring the impact of health on the broader community and the world.

**Standards** are the primary instructional targets that outline essential topics and skills that students should know and be able to do by the end of high school. Daily standards-based lesson planning enables educators to align curriculum and instruction with standards, as they have been adapted by this Diocese, thereby keeping the goals of our students in mind. The purpose of standards-based curriculum is to empower all students to meet new, challenging standards of education and to "provide them with lifelong education...that equips them to be lifelong learners." (Fullan, 2006)

The overall ADH STANDARDS/GOALS listed in the first column at every grade level are restatements of the National Science Education Standards. **Student objectives** and **enabling outcomes** are listed in sequential order by quarter. **Student objectives** are directly aligned with Diocesan Standards/Goals. They outline the primary tasks students should be able to perform as a result of instruction of all the numbered activities in the sub-skills listed under enabling outcomes. **Enabling outcomes** are skills taught that will result in mastery of the student objective. Teachers are encouraged to check outcomes as they are taught or assessed as this will drive instruction. In addition, teachers are encouraged to develop outcomes that will best enable students to achieve a measure of mastery of the student objectives. **Differentiating instruction plays a paramount role in this determination and in planning daily learning objectives.**

Each grade level curriculum represents a *minimum instructional plan* for the year. It is essential that each science/health teacher become familiar with the objectives for the preceding as well as the following grade, and has a good overall picture of the sequence of instruction throughout the twelve grades. As schools meet in their **professional learning communities**, conversations should be had regarding the use the standards, the assessments given, testing data including formative data, summative data, and standardized test data, to effectively and efficiently inform instructional planning to meet the needs of each student.

Classrooms should incorporate a learning environment that values critical thinking, oral, written, and visual communication, and encourages the active participation of the students in the learning process. Instruction should engage students in the learning process rather than allowing them to be the passive recipients of information.

Careful attention should be paid to the **Assessment** section of the document. Assessment is a key element of any curriculum whether used as an instructional tool or as a measurement of learning. Assessment for learning (formative assessment) is a powerful strategy for improving instruction and student achievement. “Assessment for learning...is about obtaining feedback on the teaching and learning and using that feedback to further shape the instructional process and improve learning.” (Fullan, 2006) Good teachers learn which assessment tools best fit the learning outcomes addressed and ensure that a variety of summative assessments are used (performance-based, independent, criterion based) to determine an accurate indication of student achievement.

Journal writing appears throughout this document as an effective learning strategy teachers are encouraged to use. **However, teachers who assign journals must understand that they are responsible for reading entries in a *timely* manner and taking appropriate action if and when students write entries that cause alarm (violent or self-destructive remarks, for example).**

## Writing

*Writing cannot be underscored enough to stress its importance in the daily activity in each curricular area.* Every day, in every classroom, students should be writing – individually, in small or whole-class groups, in journals, through emails and other Internet connections, or on electronic devices. They should be writing labs, research reports, opinions, poetry, conclusions, summaries, prayers, and reflections. In addition, teaching students to carefully and accurately cite sources for their work beginning in elementary grades, and then emphasizing various bibliography styles such as MLA or APA in middle school grades, is vital to ensure proper research method and technique in high school. A useful source for rubrics across all content areas is: [http://www.tsc.k12.in.us/ci/resource/general/Rubrics\\_TSC.htm](http://www.tsc.k12.in.us/ci/resource/general/Rubrics_TSC.htm). Just as it is impossible to imagine a school day without reading, it should be equally impossible to envision a school day without writing.

## Critical Thinking and Inquiry

Central to these standards and to the scientific research and study in this Diocese, the goal is creating knowledgeable, young people of faith. They will read with understanding, think critically and make moral decisions. In the content/note section of all grade level standards, teachers are urged to be conscience of and include critical thinking and inquiry strategies vital for our 21<sup>st</sup> century learners as they pertain to specific enabling outcomes. As they plan lessons, teachers are asked to consider the following strategies essential to the study of the sciences:

- Write simple lab reports
- Use scientific method
- Hypothesize
- Prove/disprove hypothesis
- Ask questions about objects, organisms, and events
- Conduct simple investigations
- Conduct simple experiments
- Classify objects according to attributes

- Use simple equipment and tools
- Construct reasonable explanations
- Communicate with graphs, pictures, written statements and numbers
- Make predictions
- Make inferences
- Draw conclusions
- Measure length, volume, and mass using standard/nonstandard units

## Resources

Throughout the *Standards*, there are suggested online resources or methods. All work online should be carefully monitored by the teacher and/or parent. This includes emails that are part of learning activities and assignments. Students should understand that what they write on the internet will be read by the teacher.

On the resources page you will find a variety of suggestions for teaching and learning. The supplemental materials listed are those suggested by the members of the Science Curriculum Committee and are, by no means, a complete list. Here again, teachers are encouraged to annotate this list by adding those ideas, books, DVDs, CDs, websites that are most effective in individual classroom learning environment.

Textbooks and anthologies are valuable resources that support instruction to help students meet the objectives of a standards-based curriculum. They should not be used to identify targets of instruction. (O’Shea, 2005) Textbooks must be selected from the Diocesan Approved Textbook List. If a school wishes to use a textbook resource not listed on the approved list, kindly contact the Office of Catholic Schools, Office of Curriculum, Instruction, and Assessment, for endorsement.

## Technology Integration

The seamless integration of technology and curriculum will enable students and teachers to maximize their ability to access information, enhance problem-solving skills, and develop effective communications. The *Standards* provide many such opportunities which can be incorporated into the teaching and learning processes at all levels. Highlighted areas in this document are intended to focus your attention on *Outcomes* and *Strategies* that are particularly conducive to technology integration. However, there are many other creative means of achieving this goal. Additional resources can be found at the end of this document in *Technology Integration* or at <http://adh-ocs.org/07.curriculum/resources2.html> under the heading of *Technology*.

## Cross Curricular Links

Central to these Standards and to the science/health & wellness programs of this Diocese is the goal of creating articulate young people of faith, who can read with understanding, think critically and make moral decisions. Following the standards, is a section entitled “**Suggested Cross Curricular and Catholic Social Teaching Links.**” This section is designed to help teachers link instruction in the sciences to other areas of the curriculum, and, more importantly, with how students live out their faith as expressed in Catholic social teachings. Some suggestions are included, but this part of the document must also be annotated by the teacher. The connection of science and health to life outside of school is real; it is the perfect vehicle for making Jesus’ Gospel message of peace and justice live and breathe and have its being in our schools, parishes, communities and towns.

## ASSESSMENT

*Assessment is a means of measuring performance. It illustrates how well we are accomplishing our stated mission, goals, and objectives to educate and form the whole person. Through an integrated system of standards and of multiple forms of evaluation, assessment measures:*

- *beliefs, attitudes and behaviors, which are expressions of our Catholic identity;*
- *content knowledge*
- *student achievement (individual and group) ; and the*
- *learning and teaching environment*

*(NCEA'S Statement on Accountability and Assessment in Catholic Education)*

Assessments of students should match the learning outcome or goal. In all classrooms, a variety of assessments, both objective and subjective, should be used to enhance learning and measure progress. Assessments are both instructional tools for students while they are learning and accountability tools to determine if learning has occurred. Many forms of assessment should be used including summative assessments, interim assessments, and formative assessments.

*Summative assessments* are designed initially by a teacher for each course and reflects where you want your students to be at end of unit. It is a measure OF learning designed to determine degree of mastery of each student...it judges the success of the process/product at the end.

*Formative assessments* are designed to prepare students for the summative assessment; they direct instruction and ensure students have the appropriate practice opportunities before the summative assessment. They are stops along the way. Results are used to direct instruction and/or to plan corrective activities.

	<b>FORMATIVE</b>	<b>SUMMATIVE</b>
<b>PURPOSE</b>	To monitor and guide process/product while still in progress	To judge the success of process/product at the end (however arbitrarily defined)
<b>TIME OF ASSESSMENT</b>	During the process or development of the product	At the end of the process or when the product is completed
<b>TYPES OF ASSESSMENT</b>	Informal observation, quizzes, homework, teacher questions, worksheets	Formal observation, tests, Projects, term papers, exhibitions
<b>USE OF ASSESSMENT INFORMATION</b>	To improve or change a process/product while it is still going on or being developed	Judge the quality of a process/product; grade, rank, promote

## **FORMS OF ASSESSMENT:**

### ***Criterion Referenced (CRA):***

#### **(Paper/Pencil Tests/Quizzes)**

- Multiple Choice
- Matching Items
- Completion Items
- Short Answer
- Essay Style
- Visual Representation
- Standardized Tests (*ITBS/CogAT –Grades 2-7*)
- Teacher/text created tests (Written or oral)
- Fluency tests
- Teacher or text generated check lists of skills

### ***Performance Assessment (PA):***

Student formal and informal presentations **across the curriculum using rubrics, checklists, rating scales, anecdotal records:**

- Recitations, reading, retellings, speeches, debates, discussions, video or audio performances
- Written work across the curriculum
- Cooperative group work (students are assessed individually, never as a group)
- Story, play, poem, paragraph(s), essay, research paper
- Spelling bees
- Poetry recitals
- Oratorical Competitions
- Classroom performance/demonstration (live or taped)
- Parent/Teacher/Student conferences
- Presentations (live or taped)
- Oral, dance, visual (photos or video)
- Seminars
- Projects
- Anecdotal records
- Application of Standard English in daily written and oral work across the curriculum (*including notebooks, journals, blogs, responses to questions*)
- Teacher observation of student activities across the curriculum
- Oral reading
- Informal and formal inventories
- Daily work
- Student spelling in written work
- Notebook checks

- Running records
- Application of skills across the curriculum
- \*Portfolios

**\*All schools are required keep portfolios of student writing.** Each year there should be a minimum of two pieces of original writing included in the portfolio. The writing may be from any area of curriculum (religion, math, social studies, science, etc.), but **must be accompanied by the rubric used to evaluate the writing.**

***Independent (IA):***

- Teacher observation
- Teacher-student conference
- Student self-correction and reflection on learning and performance
- Student self-assessment of goals
- On-line programs that allow students to self-assess
- Instructional questions
- Questionnaires
- Response Journals
- Learning Logs
- Oral tests/exams

## Science Curriculum Rationale

The citizen of the twenty-first century must be scientifically literate. He/She must have a basic knowledge of science and its processes to appreciate the wonders of the universe, analyze the problems presented by life, and develop appropriate and morally responsible solutions to those problems.

He/She must have knowledge and understanding of the scientific concepts and processes required for personal decision making, participation in civic and cultural affairs and economic productivity (National Academy of Sciences, 1995).

### ***Students Who are Scientifically Literate:***

- Have the knowledge and understanding of scientific concepts and processes required for participation in a Digital Age society.
- Can ask, find or determine answers to questions derived from curiosity regarding everyday experiences.
- Have the ability to describe, explain and predict natural phenomena.
- Are able to read and understand articles about science in the popular press and to engage in social conversation about the validity of those conclusions.
- Can identify scientific issues underlying national and local decisions and express positions that are scientifically and technologically informed.
- Are able to evaluate the quality of scientific information on the basis of its source and the methods used to generate it.
- Have the capacity to pose and evaluate arguments based on evidence and to apply conclusions from such arguments appropriately.

### ***Changing Emphases***

The *National Science Education Standards* envision systemic changes in the study of science. The science content standards encompass the following changes in emphases:

#### **Less Emphasis On**

Knowing scientific facts and information

Studying subject matter disciplines (physical, life, earth sciences) for their own sake

Separating science knowledge and science process

Covering many science topics

Implementing inquiry as a set of processes

#### **More Emphasis On**

Understanding scientific concepts and developing abilities of inquiry

Learning subject matter disciplines in the context of inquiry, technology, science in personal and social perspectives, and history and nature of science

Integrating all aspects of science content

Studying a few fundamental science concepts

Implementing inquiry as instructional strategies, abilities and ideas to be learned

**GRADE 1 – SCIENCE CURRICULUM**

DIOCESAN STANDARDS/GOALS	Topics	Objectives/Enabling Outcomes
<p><b><u>QUARTER 1:</u></b></p> <ul style="list-style-type: none"> <li>I. Increase natural curiosity about and observation of the world</li> <li>II. Describe, explain, and predict natural phenomena</li> <li>III. Connect concepts and skills learned in science with an understanding of God as the center of all things</li> <li>IV. Read and write about science and the world using both books and technology</li> <li>V. Answer questions about the natural world based upon observation and investigation</li> <li>VI. Use senses and simple measuring tools to explore the properties of objects</li> <li>VII. Understand that God calls us to care for His creation</li> <li>VIII. Understand the responsibility to take care of their own spiritual and physical well-being</li> <li>IX. Use technology to explore and express scientific learning</li> <li>X. Develop skills and ability to do</li> </ul>	<p><b>animal habitats, animal life cycles</b></p>	<p><b>To describe the different ways that animal, including humans, obtain water and food.</b>                      The student will:</p> <ul style="list-style-type: none"> <li>1. <b>Match</b> an animal with its appropriate habitat</li> <li>2. <b>Develop</b> ways in which each person can take care of living things</li> <li>3. <b>Compare</b> and <b>contrast</b> humans and animals (use charts, graphs, etc.)</li> <li>4. <b>Illustrate</b> a simple food chain/web</li> <li>5. <b>Formulate</b> questions about living and nonliving things</li> <li>6. <b>Make</b> predictions about things that will grow and things that will not</li> <li>7. <b>Conduct</b> experiments to see what living things need to survive</li> </ul> <p><b>To describe the changes in organisms, such as frogs and butterflies, as they undergo metamorphosis.</b>                      The student will:</p> <ul style="list-style-type: none"> <li>1. <b>Describe</b> how animals grow and change in different ways</li> </ul> <p><b>To describe the life cycles of organisms that grow but do not metamorphose.</b>                      The student will:</p> <ul style="list-style-type: none"> <li>1. <b>Compare</b> and <b>contrast</b> different animals (use charts, graphs, etc.)</li> <li>2. <b>Describe</b> the defining characteristics of birds, fish, insects, and mammals</li> </ul> <p><b>To describe the structures that animals, including humans, use to move around.</b>                      The student will:</p> <ul style="list-style-type: none"> <li>1. <b>Compare</b> and <b>contrast</b> the adaptations that animals have made in order to survive (use charts, graphs, etc.)</li> <li>2. <b>Describe</b> animals need for air, water and food for survival and diagram the structures that animals have developed in order to survive and meet these needs.</li> </ul>

<p>scientific inquiry</p> <p><b><u>Health / Wellness</u></b></p> <ol style="list-style-type: none"> <li>I. Identify and demonstrate health promotion and disease prevention concepts.</li> <li>II. Access and utilize valid health information and health promoting products and services.</li> <li>III. Practice behaviors that promote health and reduce health risks.</li> <li>IV. Analyze the influence of culture, media, technology, and other actors on health.</li> <li>V. Utilize social and communication skills to enhance health.</li> <li>VI. Use goal-setting and decision-making skills to enhance health.</li> <li>VII. Advocate for personal, family, and community health and wellness.</li> </ol>	<p><b>Health/Wellness</b></p>	<p><b>To know that growth and development occurs from infancy to early childhood.</b></p> <p>The students will:</p> <ol style="list-style-type: none"> <li>1. describe external body changes from infancy to present age.</li> </ol> <p><b>To know names and general functions of the five sense.</b></p> <p>The students will:</p> <ol style="list-style-type: none"> <li>1. use drawings, diagrams, examples, name, and demonstrate the 5 senses: hearing, seeing, smelling, touching, tasting</li> </ol> <p><b>To know how to get help in an emergency; practice safe behaviors in case of fire.</b></p> <p>The students will:</p> <ol style="list-style-type: none"> <li>1. using a toy telephone, call 911, state name, address clearly</li> <li>2. stress proper use of 911</li> <li>3. state parents'/guardians' real names (not "mommy")</li> <li>4. HOME ACTIVITY: create a home fire safety plan</li> <li>5. Practice "stop, drop, roll" if clothing catches on fire</li> <li>6. Discuss "get out," "get help" rule for fire safety</li> </ol>
--	-------------------------------	--

## **QUARTER 2:**

- I. Increase natural curiosity about and observation of the world
- II. Describe, explain, and predict natural phenomena
- III. Connect concepts and skills learned in science with an understanding of God as the center of all things
- IV. Read and write about science and the world using both books and technology
- V. Answer questions about the natural world based upon observation and investigation
- VI. Use senses and simple measuring tools to explore the properties of objects
- VII. Understand that God calls us to care for His creation
- VIII. Understand the responsibility to take care of their own spiritual and physical well-being
- IX. Use technology to explore and express scientific learning
- X. Develop skills and ability to do scientific inquiry

## **matter, magnets**

### **To understand that all things are made up of matter.**

The student will:

1. **Describe** things as made up of matter
2. **Describe** the three main states of matter
3. **Describe, sort, and classify** objects according to physical properties (size, weight, color, space, and temperature)
4. **Predict** how some common liquids will interact with water
5. **Develop** questions about how temperature may or may not affect the dissolvability of solids
6. **Describe** the space and mass of a variety of kinds of matter
7. **Describe** what happens when two things try to occupy the same space
8. **Identify** the three main states of matter: solid, liquid, gas
9. **Describe** how matter can change

### **To investigate the properties of magnets**

The student will:

1. **Demonstrate** how magnets attract things with iron in them
2. **Identify** a magnet's two poles
3. **Show** how like poles repel and opposite poles attract
4. **Make** and test predictions about how a magnet will move a variety of objects

## Health / Wellness

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VIII. Advocate for personal, family, and community health and wellness.

## QUARTER 3:

- I. Increase natural curiosity about and observation of the world
- II. Describe, explain, and predict natural phenomena
- III. Connect concepts and skills learned

## Health/Wellness

energy, motion,  
mass

### **To know behaviors that help maintain health.**

The students will:

1. list 4 behaviors/habits that promote health (i.e. enough sleep, good nutrition, safe play, wash hands, exercise, quiet times, etc.)
2. describe good dental hygiene habits
3. name 4 food groups and examples of each
4. identify common protective equipment to prevent injury (i.e. helmets, seatbelts, bus safety, etc.)

### **To know symptoms of common childhood illnesses and how to prevent their spread.**

The students will:

1. identify common illnesses and symptoms (i.e., colds: sore throat, runny nose, cough)
2. explain common ways to prevent spread of germs (i.e., frequent hand washing, proper disposal of tissues, etc.)
3. demonstrate how to avoid contact with others' body fluids

### **To identify ways health information can be used.**

The students will:

1. find examples that effectively present nutrition, learning how to brush/floss teeth, etc. from various positive media sources

### **To describe how the motion of objects can be changed by pushing or pulling.**

The student will:

1. **Demonstrate** how energy is needed to produce a force
2. **Observe** patterns and predict the motion of objects
3. **Create** objects and make predictions about their movement

### **To measure and compare the sizes and weights of different objects and**

in science with an understanding of God as the center of all things

- IV. Read and write about science and the world using both books and technology
- V. Answer questions about the natural world based upon observation and investigation
- VI. Use senses and simple measuring tools to explore the properties of objects
- VII. Understand that God calls us to care for His creation
- VIII. Understand the responsibility to take care of their own spiritual and physical well-being
- IX. Use technology to explore and express scientific learning
- X. Develop skills and ability to do scientific inquiry

### **Health / Wellness**

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.

### **Health/Wellness**

### **organisms using standard and non-standard measuring tools.**

The student will:

- 1. **Sort** objects in a variety of ways and relate the properties of the objects to their uses
- 2. **Measure** how much an object moves with a ruler
- 3. **Use** a simple balance to estimate and measure mass
- 4. **Observe, measure and classify** different objects by color, size, shape and weight
- 5. **Use** senses and simple measuring tools to collect data (ruler, measuring cup, thermometer)
- 6. **Develop** nonstandard tools to measure

### **To investigate forms of energy**

The student will:

- 1. **Identify** sound as a kind of energy
- 2. **Demonstrate** how sound is made when things vibrate
- 3. **List** sources of light energy
- 4. **Identify** uses of electricity

### **To demonstrate responsible Christian behavior in the local school community.**

The students will

- 1. role play cooperative behavior
- 2. role play following classroom and school rules
- 3. create visual display of contributing to a healthy environment by proper disposal of trash, prevention of water pollution, water conservation, etc.

### **To recognize sources of conflict and skills to resolve conflict.**

The students will:

- 1. talk about specific classroom/playground conflicts and how to resolve them
- 2. role play scenarios of conflict and resolution

- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and community health and wellness.

**To recognize and identify feelings and appropriate responses to them.**

The students will:

- 1. list ways to calm one self when upset and/or angry
- 2. appropriately express feelings
- 3. describe ways a trusted adult can help one feel safe and stay healthy
- 4. name things that make one experience specific feelings i.e., happy, sad, angry, hurt, compassionate, etc.

**QUARTER 4:**

- I. Increase natural curiosity about and observation of the world
- II. Describe, explain, and predict natural phenomena
- III. Connect concepts and skills learned in science with an understanding of God as the center of all things
- IV. Read and write about science and the world using both books and technology
- V. Answer questions about the natural world based upon observation and investigation
- VI. Use senses and simple measuring tools to explore the properties of objects

**plants, sun & sky**

**To describe the different structures plants have for obtaining water and sunlight.**

The student will:

- 1. **List** what plants need to live
- 2. **Describe** the main parts of plants
- 3. **Observe** how seeds grow

**To describe the apparent movement of the sun across the sky and the changes in the length and direction of shadows during the day.**

The student will:

- 1. **Track** the movement of celestial bodies over time
- 2. **Pose** questions about the effect of the sun on the Earth
- 3. **Draw** pictures describing the night and day skies
- 4. **Make and record** how shadows change during the day

- VII. Understand that God calls us to care for His creation
- VIII. Understand the responsibility to take care of their own spiritual and physical well-being
- IX. Use technology to explore and express scientific learning
- X. Develop skills and ability to do scientific inquiry

Health / Wellness

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- IX. Advocate for personal, family, and community health and wellness.

**Health/Wellness**

**To know dangers and safety precautions in the immediate environment.**

The students will:

1. name safe play environments (i.e., own yard, porch, school playground, playground with a trusted adult)
2. tell meanings of traffic signals
3. explain reasons for smoke and carbon monoxide detectors
4. explain ways family members can help one another safety healthy/safe

**To know that information can come in various ways.**

The students will:

1. discuss positive and negative uses of TV, Internet, video games, magazines

**To know safety rules regarding medicines and dangerous substances.**

The students will:

1. identify warning signs on harmful household products
2. name persons who might appropriately give a child medicine (emphasize that it would be inappropriate to take any substance/medication from an unknown person)

## Strategies – Grade One

Suggested Teaching Strategies	Suggested Learning Strategies
<p><b>Teacher Directed</b> The teacher:</p> <ul style="list-style-type: none"> <li>• Provides a variety of print materials to engage students in learning about the world around them</li> <li>• Arranges field trips to enhance learning</li> <li>• Invites guest speakers from science related fields</li> <li>• Provides classroom pets</li> </ul> <p><b>Other:</b> _____</p> <hr/>	<p><b>Teacher Directed</b> The teacher:</p> <ul style="list-style-type: none"> <li>• Reads nonfiction books to students and relates to the study of science</li> </ul> <p><b>Other:</b> _____</p> <hr/> <p><b>Cooperative</b> Students:</p> <ul style="list-style-type: none"> <li>• Sort objects according to physical characteristics and find different ways to sort the same objects.</li> <li>• Observe and record the time it takes for an ice cube to melt.</li> <li>• Roll a ball across the floor. Record the distance traveled.</li> <li>• See how far a voice will carry over a given distance.</li> <li>• Predict, test, <b>chart</b> which objects in a group of objects will stick to a magnet</li> <li>• Design a diorama with examples of machines benefiting people</li> <li>• <b>Work together to create charts of things as living and non-living</b></li> <li>• Classify plants and animals by physical features</li> <li>• <b>Chart different plants and their uses</b></li> </ul> <p><b>Other:</b> _____</p> <hr/> <p><b>Independent</b> Students:</p>

- Keep personal journals or blogs (online journals) of scientific observations

Other: \_\_\_\_\_

## Suggested Cross Curricular and Catholic Social Teaching Links

### Grade One

-  In recording observations of plant growth, students discuss how they take care of God's creation. (Science, Math, Religion)
-  While reading non-fiction selections related to nature (The Giving Tree, The Very Hungry Caterpillar) students understand their role as stewards of God's creation. (Language Arts, Religion, Science)
-  Create murals depicting plants, animals, and their environments. (Art)
-  Take a nature hike or walk on your grounds to observe and gather objects to classify. Write a sentence their observations. (P.E., Language Arts)
-  Work together in small groups, share materials, help each other, discuss results. (Religion)
-  Listen to a story about a famous scientist and find out what he/she noticed that led to a discovery. (Social Studies)

### Notes:

---

---

---

---

---

Text/Resources: \_\_\_\_\_

---

---

---

## **SCIENCE CURRICULUM – GRADE 2**

**DIOCESAN STANDARDS/GOALS**

**Strand/Topic**

**Objectives/Enabling Outcomes**

**QUARTER 1**

- I. Connect concepts and skills learned in science with their responsibilities as Catholics towards all of Creation
- II. Make observations and ask questions about objects, organisms, and the environment
- III. Gather information, make predictions based on observed patterns and represent the data in graphs and charts (text or electronic)
- IV. Read and write about science and the world using books and technology
- V. Use their senses and standard tools to measure and describe physical properties of matter
- VI. Articulate their observations of the natural world
- VII. Explore and describe the interconnectedness of organisms and their environments
- VIII. Use technology to explore and express scientific learning
- IX. Increase natural curiosity about and observation of the world
- X. Describe, explain, and predict natural phenomena
- XI. Understand that God calls us to care for His creation
- XII. Understand their responsibility to take care of their own physical and spiritual well being

**Health/Wellness**

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.

**Physical Science  
**Matter,  
Magnets****

**Health/Wellness**

**To describe differences in the physical properties of solids and liquids**

The student will:

- 1. **Describe** and **classify** objects according to their state of matter (solid, liquid, or gas)
- 2. **Design** an investigation to determine the factors that affect evaporation
- 3. **Identify** condensation, evaporation, melting and freezing of water
- 4. **Describe** the transformation of one state of matter to another
- 5. **List** the uses of water at home and in school

**To investigate and show how natural and artificial magnets have certain kinds of characteristics and attract specific types of metal.**

The student will:

- 1. **Identify, observe, record** and **discuss** the behavior of magnets
- 2. **Predict** and **test** magnetic behavior with iron bearing and non-iron bearing materials
- 3. **Compare** natural magnet with artificial ones
- 4. **Conduct** an investigation to determine how the different poles of magnets react to the poles of other magnets
- 5. **Identify** the applications of magnets in life
- 6. **Create** new applications for magnets
- 7. **Use** magnetic compasses to determine the directions of north and south poles

**To know major body organs (heart, lungs, stomach, brain).**

**To know basic information about teeth.**

The students will:

- 1. Trace body outline and label major organs
- 2. Draw and describe function of teeth
- 3. Summarize the difference between primary and secondary teeth

- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and community health and wellness.

## QUARTER 2

- I. Connect concepts and skills learned in science with their responsibilities as Catholics towards all of Creation
- II. Make observations and ask questions about objects, organisms, and the environment
- III. Gather information, make predictions based on observed patterns and represent the data in graphs and charts (text or electronic)
- IV. Read and write about science and the world using books and technology
- V. Use their senses and standard tools to measure and describe physical properties of matter
- VI. Articulate their observations of the natural world
- VII. Explore and describe the interconnectedness of organisms and their environments
- VIII. Use technology to explore and express scientific learning
- IX. Increase natural curiosity about and observation of the world
- X. Describe, explain, and predict natural

## Energy, Mass

### To identify common causes of conflict among children.

The students will:

1. Brainstorm and list possible causes for conflict
2. Brainstorm and list ways to promote positive relationships (active listening, taking turns, sharing, following rules, etc.)

### To practice methods to cope with stress.

The students will:

1. Distinguish between verbal and nonverbal communication
2. Identify, list, and role play good listening skills
3. Identify, list, and role play healthy and appropriate ways to express needs, wants, and emotions.

### To measure and compare the sizes and weights of different objects and organisms using standard and non-standard measuring tools.

The student will:

1. **Use** metric units to **measure** the physical characteristics of various objects
2. **Distinguish** between mass and weight of objects
3. **Use** a thermometer, **record** temperature changes, and **graph** seasonal variations
4. **Identify, observe, record,** and **discuss** the behavior of magnets

### To investigate forms of energy.

The student will:

1. **Explain** the characteristics of sound (reflection, absorption, intensity, and pitch)
2. **Explain** how heat energy affects an object's state of matter
3. **Manipulate** objects to illustrate how they can reflect, absorb, block, or allow light to pass through

phenomena

- XI. Understand that God calls us to care for His creation
- XII. Understand their responsibility to take care of their own physical and spiritual well being

### Health/Wellness

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and community health and wellness.

### QUARTER 3

- I. Connect concepts and skills learned in science with their responsibilities as Catholics towards all of Creation
- II. Make observations and ask questions about objects, organisms, and the environment
- III. Gather information, make predictions base on observed patterns and represent the data in graphs and charts (text or electronic)
- IV. Read and write about science and the world using books and technology
- V. Use their senses and standard tools to measure and describe physical properties of matter
- VI. Articulate their observations of the natural

### **Health/Wellness**

#### **To know behaviors that help a person stay healthy.**

The students will:

1. Describe how medical checkups (dental and physical) keep a person healthy
2. Describe how a healthy diet can protect against certain diseases/conditions
3. Explain ways germs can be passed from one person to another
4. Describe basic hygiene practices that prevent/control diseases
5. Demonstrate proper hand washing
6. Name the basic food groups and select foods from each group
7. Explain how physical activity promotes good health

#### **To practice behaviors that protect personal safety.**

The students will:

1. List dangerous substances/situations and how to avoid them i.e., poisonous household products, weapons, unprotected swimming areas, not wearing a seat belt or bicycle helmet, etc
2. Describe protection from the sun and the cold and various types of weather

### **Earth Science** **Weather, Soil**

#### **To discover and describe the varied physical properties which make earth materials useful in different ways.**

The student will:

1. **Describe** soils by their particle size, color, composition, texture and capacity to retain water
2. **Sort** different soils by properties, such as particle size, color, and composition
3. **Relate** the properties of different soils to their capacity to retain water and support the growth of certain plants
4. **Read** seed packets and **select** appropriate plants for a given type
5. **Identify** bodies of water on a map
6. **Observe** and **record** the effects of colored water on celery
7. **Create** and **label** a water cycle chart

world

- VII. Explore and describe the interconnectedness of organisms and their environments
- VIII. Use technology to explore and express scientific learning
- IX. Increase natural curiosity about and observation of the world
- X. Describe, explain, and predict natural phenomena
- XI. Understand that God calls us to care for His creation
- XII. Understand their responsibility to take care of their own physical and spiritual well being

#### Health/Wellness

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and community health and wellness.

#### QUARTER 4

- I. Connect concepts and skills learned in science with their responsibilities as Catholics towards all of Creation
- II. Make observations and ask questions about objects, organisms, and the environment

#### **Health/Wellness**

##### **To investigate and understand basic types, changes and patterns of weather.**

The student will:

1. **Observe** and **record** daily weather over time
2. **Predict** weather based on data collections
3. **Use** clouds to predict weather
4. **Observe** and **record** animal behavior related to weather
5. **Create** charts and/or graphs of weather-related data

##### **To know the difference between helpful and not helpful medicines.**

The students will:

1. Recognize that medication is taken for illnesses and given by a trusted adult
2. Distinguish between medicine and “street drugs”
3. Identify people who can provide good health information

##### **To practice good personal health habits.**

The students will:

1. Describe/demonstrate washing hands, brushing/flossing teeth, choosing healthy foods, exercise

#### **Life Science Nutrition, Life Cycles**

##### **To investigate and describe the orderly life cycles of plants and animals**

The student will:

1. **Use** senses to make observations
2. **List** what plants need to live
3. **Describe, sort** and **classify** plants according to physical properties
4. **Explore** and **describe** the effects of light and water on seed germination and plant growth

- III. Gather information, make predictions based on observed patterns and represent the data in graphs and charts (text or electronic)
- IV. Read and write about science and the world using books and technology
- V. Use their senses and standard tools to measure and describe physical properties of matter
- VI. Articulate their observations of the natural world
- VII. Explore and describe the interconnectedness of organisms and their environments
- VIII. Use technology to explore and express scientific learning
- IX. Increase natural curiosity about and observation of the world
- X. Describe, explain, and predict natural phenomena
- XI. Understand that God calls us to care for His creation
- XII. Understand their responsibility to take care of their own physical and spiritual well being

### Health/Wellness

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to

### **Health/Wellness**

5. **Describe** the main parts of plants and what they do
6. **Describe** how seeds are scattered
7. **Describe** how light and water affect seed germination
8. **Observe** and **describe** the life cycles of flowering plants from germination to seed dispersal
9. **Dramatize** how humans use plants
10. **Describe** how all organisms depend on green plants to survive
11. **List** what organisms need to survive (food, water, air, habitat, and the ability to adapt to environment)
12. **Compare** and **contrast** different animals
13. **Compare** and **contrast** different habitats of animals
14. **Compare** and **contrast** animals and human beings
15. **Describe** how animals grow and change in different ways
16. **Describe** the defining characteristics of birds, fish, insects and mammals
17. **Create** prayers that celebrate the gift of creation
18. **List** ways in which students take responsibility for living things as stewards of the earth
19. **Compare** and **contrast** two organisms that have distinct life cycles (i.e., moth and frog)
20. **List** animals whose young resemble their parents from birth to maturity

### **To describe the nutritional needs of humans including the essential components of balanced nutrition.**

The student will:

1. **Identify** the sources of common foods and classify them by food group
2. **Describe** how diverse cultures use different food sources to meet their nutritional needs

### **To understand the effects of media on health.**

The students will:

enhance health.

VII. Advocate for personal, family, and community health and wellness.

1. Collect samples of food ads and analyze and discuss how they influence our thinking
2. Discuss how advertising promotes images of health
3. Discuss how certain products improve health (i.e. sunscreen, safety equipment, new advances in medication, etc)

**To distinguish the differences between safe and risky behaviors.**

The students will:

1. List safe actions; List risky actions
2. Describe how personal decisions about behaviors affect oneself and others
3. Emphasize need to make one's own decisions as opposed to following a group or crowd or popular opinion, etc.

## Strategies – Grade 2

Suggested Teaching Strategies	Suggested Learning Strategies
<p><b>Teacher Directed</b> The teacher:</p> <ul style="list-style-type: none"> <li>• Provides a variety of print materials to engage students in learning about the world around them</li> <li>• Provides classroom pets and plants</li> <li>• Creates an environment in which students are encouraged to make observations and predictions</li> <li>• Invites local community resource people (water company, nursery owners, meteorologists, etc.) to enhance learning</li> <li>• Arranges field trips (real and virtual) that enhance scientific learning-zoos, science museums, nature centers</li> </ul> <p><b>Other:</b> _____</p> <hr/>	<p><b>Teacher Directed</b> The teacher:</p> <ul style="list-style-type: none"> <li>• Reads nonfiction books to students and relates to the study of science</li> <li>• Provides newspaper and electronic weather reports</li> <li>• Leads students in experiments that demonstrate warm air rising or tornadoes in bottles</li> <li>• Chart and diagram plants that have been watered versus those that have not been watered</li> <li>• Plant seeds and chart growth</li> </ul> <p><b>Other:</b> _____</p> <hr/> <p><b>Cooperative</b> Students:</p> <ul style="list-style-type: none"> <li>• Work together to create charts of things as living and nonliving</li> <li>• Classify plant and animals by physical features</li> <li>• Chart different plants and their uses</li> <li>• Chart clouds</li> </ul> <p><b>Other:</b> _____</p> <hr/> <p><b>Independent</b> Students:</p> <ul style="list-style-type: none"> <li>• Keep personal journals or blogs (Online journals) of scientific observations</li> </ul> <p><b>Other:</b> _____</p> <hr/>

**Suggested Cross Curricular and Catholic Social Teaching Links**

**Grade Two**

- ✚ Students write life stories from the point of view of a frog going through its life cycle. (Science, Language Arts)
- ✚ Students write poems and prayers about the miracle of growth and life. (Science, Religion, Language Arts)

**Notes:**

---

---

---

---

---

**Text/Resources:**

---

---

---

---



<p>technology, and other actors on health.</p> <p>V. Utilize social and communication skills to enhance health.</p> <p>VI. Use goal-setting and decision-making skills to enhance health.</p> <p>VII. Advocate for personal, family, and community health and wellness.</p>		<p>graphs, etc.)</p> <ol style="list-style-type: none"> <li>2. Distinguish between good/bad touch</li> <li>3. Weapon safety</li> <li>4. Explain and demonstrate how to escape from a fire</li> <li>5. Demonstrate and practice appropriate participation in a fire drill and lock down protocol</li> <li>6. Describe the effects of bullying and peer pressure</li> <li>7. Distinguish between positive and negative peer pressure</li> <li>8. List ways to solve conflicts peacefully</li> <li>9. Tell what to do in an emergency</li> <li>10. Set personal goals for good health</li> <li>11. Develop a class project to make the classroom/playground safe</li> </ol>
<p><b><u>QUARTER 2</u></b></p> <ol style="list-style-type: none"> <li>I. Connect concepts and skills learned in science with their responsibilities as Catholics towards all of creation</li> <li>II. Appreciate that scientific inquiry is a carefully designed attempt to investigate and communicate about the world</li> <li>III. Use the skills of scientific literacy: speaking, listening, presenting, interpreting, reading, and writing about science</li> <li>IV. Select and employ appropriate mathematical tools for working with data</li> <li>V. Explore how the properties of matter change and how various substances can be separated by using those properties</li> <li>VI. Explore the power of water in relation to conservation, life, and the water cycle</li> <li>VII. Explore how people use renewable and non-renewable resources and to discuss different methods of conserving those resources</li> </ol>	<p><b>Matter</b></p>	<p><b>To describe the effect of heating on the melting, evaporation, condensation and freezing of water.</b></p> <p>The student will:</p> <ol style="list-style-type: none"> <li>1. <b>Draw</b> a water molecule and <b>identify</b> the structures</li> <li>2. <b>Describe</b> the relationship between states and phases of matter</li> <li>3. <b>Explore</b> the properties of water in solid, liquid, and gas states</li> <li>4. <b>Describe</b> the effect of heating and cooling on water properties</li> </ol>

## Health/Wellness

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and community health and wellness

## **Health / Wellness**

### **To know six body systems**

The students will:

1. Accurately label a line drawing of the body locating and naming the circulatory, respiratory, nervous, skeletal, muscular systems

### **To know appropriate ways to gather and access health information.**

The students will:

1. Demonstrate identifying and using health-related publications from home and school
2. Identify appropriate health services and agencies to gain information
3. List people who positively influence health behavior
4. Locate and identify local school and community health helpers
5. Identify positive and negative effects of advertising
6. List electronic and other media sources that provide reliable, accurate health information

Write a grade-appropriate research paper on a health issue that affects their age group.

### QUARTER 3

- I. Connect concepts and skills learned in science with their responsibilities as Catholics towards all of creation
- II. Appreciate that scientific inquiry is a carefully designed attempt to investigate and communicate about the world
- III. Use the skills of scientific literacy: speaking, listening, presenting, interpreting, reading, and writing about science
- IV. Select and employ appropriate mathematical tools for working with data
- V. Explore how the properties of matter change and how various substances can be separated by using those properties
- VI. Explore the power of water in relation to conservation, life, and the water cycle
- VII. Explore how people use renewable and non-renewable resources and to discuss different methods of conserving those resources

### Plants, Animals

**To describe how different plants and animals are adapted to obtain air, water, food and protection in specific land and water habitats.**

The student will:

1. **Define** and **identify** the classes of organisms
2. **Describe** the different types of habitats in which organisms live
3. **Compare** different plant and animal ecosystems
4. **Explain** how organisms adapt to their environments, get food, and live together
5. **Describe** the relationship between a predator and a prey
6. **Know** the difference between a food chain and a food web
7. **Identify** the parts of a plant
8. **Describe** the functions of roots, stems, and leaves
9. **Know** what flowers and cones do
10. **Illustrate** how plants grow from seeds
11. **Understand** the relationship between light and the growth of plants

## Health/Wellness

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and community health and wellness

## QUARTER 4

- I. Connect concepts and skills learned in science with their responsibilities as Catholics towards all of creation
- II. Appreciate that scientific inquiry is a carefully designed attempt to investigate and communicate about the world
- III. Use the skills of scientific literacy: speaking, listening, presenting, interpreting, reading, and writing about science
- IV. Select and employ appropriate mathematical tools for working with data

## Health/Wellness

### To know conflict resolution skills

The students will:

1. Use role playing to demonstrate and implement positive conflict resolution techniques
2. Discuss ways to cope with conflict
3. Discuss Christian interactions with family, peers, and other individuals

### To explain how customs and traditions may impact community health decisions.

The students will:

1. List way people are different and alike
2. Describe how common foods are used in different cultures (rice, corn, meat)
3. Celebrate multi-cultural customs and traditions
4. Explain religious and non-religious celebrations and traditions problems/issues

## Conservation, Rocks

### To describe how earth materials can be conserved by reducing the quantities used, and by reusing and recycling materials rather than discarding them.

The student will:

1. **Understand** the need for protecting resources that cannot be replaced
2. **Describe** how the disappearance or extinction of one plant or animal species threatens others
3. **Identify** the natural resources that can and cannot be recycled
4. **List** some of the effects of environmental changes on plants and animals

- V. Explore how the properties of matter change and how various substances can be separated by using those properties
- VI. Explore the power of water in relation to conservation, life, and the water cycle
- VII. Explore how people use renewable and non-renewable resources and to discuss different methods of conserving those resources

### **Health/Wellness**

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and community health and wellness

### **Health/Wellness**

#### **To relate the properties of rocks to the possible environmental conditions during their formation.**

The student will:

1. **Diagram** and **explain** the rock cycle
2. **Demonstrate** the processes of weathering and erosion
3. **Describe** the different ways that some materials can be conserved
4. **Explain** why people need to protect Earth's resources
5. **Compare** and **contrast** the forces in nature (volcanoes, tornadoes, floods, etc.) on different rocks
8. **Explore** the properties of water and how it moves through different types of earth materials

#### **To know drugs can be helpful or harmful.**

The students will:

1. State the difference between "good" and "bad" drugs
2. Identify harmful effects of tobacco, alcohol, and other drugs

#### **To be able to identify the effect of media and technology on health**

The students will:

1. Describe how the TV, the Internet, magazines, newspapers, etc., affect health knowledge, choices, and behavior
2. State ways medical technology has improved over the years (i.e. audio visual, print, etc.)

#### **To know that environment can be improved.**

The students will:

1. Discuss how people can solve environmental problems that cause illness
2. List health problems that results from unhealthy environments: asthma, lead poisoning
3. Develop a class project that can help community environmental

## Strategies – Grade 3

Suggested Teaching Strategies	Suggested Learning Strategies
<p><b>Teacher Directed</b> The teacher:</p> <ul style="list-style-type: none"> <li>• Provides a variety of print materials to engage students in learning</li> <li>• Provides a digital camera and video recording material to “capture” the world of forces and motion</li> <li>• Provides a variety of materials to engage students in learning about habitats and ecosystems and their interdependence</li> <li>• Encourages students to read selected fiction and nonfiction books that relate to nature</li> <li>• Describes the role of stewardship in the proper use of our natural resources</li> <li>• Provides a variety of fiction and non-fiction materials to engage students in the movement and changes of our Earth and other terrestrial bodies</li> </ul> <p><b>Other:</b> _____</p> <hr/>	<p><b>Teacher Directed</b> The teacher:</p> <ul style="list-style-type: none"> <li>• Reads nonfiction books to students that relate to the world of physical science</li> <li>• Leads students in experiments to observe, predict, calculate, and reflect on the world around them</li> </ul> <p><b>Cooperative</b> Students:</p> <ul style="list-style-type: none"> <li>• Work together to create charts that show the relationship between states/phases of matter</li> <li>• Design a compound machine</li> <li>• Create data table related to forces and motions of rolling objects</li> <li>• Design a diorama of machines benefiting people</li> <li>• Create murals or dioramas of a plant or animal habitat</li> <li>• Build a model of a greenhouse; plant some seeds and keep a log of observed growth and habitat changes over a set period of time</li> <li>• Identify organisms whose habitats have been adversely affected by change; discuss the impact the change has had on them</li> <li>• Draw a cross-sectional diagram of the Earth with layers</li> <li>• Create a diagram showing how, through weathering and erosion, rocks become part of the soil</li> <li>• Research and create a model of a landform</li> <li>• Find pictures, (magazine, internet, digital camera) of different rock formations and other physical features of the Earth. Present finding in a photo journal</li> </ul> <p><b>Independent</b> Students:</p> <ul style="list-style-type: none"> <li>• Keep personal journals or blogs (Online journals) of scientific observations</li> </ul>

## Suggested Cross Curricular and Catholic Social Teaching Links

### Grade Three

- ✚ Students listing ways their communities can use renewable and non-renewable resources wisely. (Science, Religion, Social Studies)
- ✚ Students write a story based on why God wants us to be stewards (protectors) of our planet Earth, and relate this to how all living things (organisms) have a special role to play in the ecosystems around them. (Science, Language Arts, Religion)
- ✚ Prepare a storyboard (a series of cartoon-like illustrations) on a topic related to a “good neighbor’s or “a whole community’s responsibility to recycle, preserve wildlife habitats, etc.
- ✚ Students write a story about how we are responsible for taking care of planet Earth and develop two different endings – one in which we protect our natural resources and one in which we do not.
- ✚ Students visit a community resource such as a park or natural habitat; find examples that show evidence of caring for the environment and present visual displays of their findings.

#### Notes:

---

---

---

---

#### Text/Resources:

---

---

---



- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and community health and wellness.

**QUARTER 2**

- I. Connect concepts and skills learned in science with their responsibilities as Catholics towards all of Creation
- II. Make observations and ask questions about objects, organisms, and the environment
- III. Gather information, make predictions base on observed patterns and represent the data in graphs and charts (text or electronic)
- IV. Read and write about science and the world using books and technology
- V. Use their senses and standard tools to measure and describe physical properties of matter
- VI. Articulate their observations of the natural world
- VII. Explore and describe the interconnectedness

**Energy**

**To know the effect of diet on health**

The students will:

- 1. Explain the nutrients needed for proper brain function (i.e., breakfast)
- 2. Explain the effects of malnutrition
- 3. Identify the six major nutrients in food eaten the previous day: carbohydrates, proteins, fats, water, minerals, vitamins
- 4. Explain how nutrition needs change with growth and development
- 5. Describe effects of good nutrition on teeth
- 6. Bring in menus (from fast food, other restaurants or from Internet) and food labels to class to discuss nutrition information found

**To identify the basic forms of energy (light, sound, heat, electrical and magnetic) and recognize that energy is the ability to force motion or cause change.**

The student will:

- 1. **Describe** light patterns and changes in mirrors, lenses, prisms and other reflective surfaces
- 2. **Explain** how light is energy
- 3. **Demonstrate** how sound is a form of energy
- 4. **Demonstrate** how the medium through which it travels affects the speed of sound
- 5. **Demonstrate** that sound can make things move (Build a simple drum and bounce paper bits or peppercorns on it.)
- 6. **Demonstrate** differences in pitch (i.e., using glasses filled to different heights and tap with a spoon)
- 7. **Define** and **demonstrate** pitch or frequency, vibrations and amplitude of vibration
- 8. **Describe** what determines the volume of sound

- of organisms and their environments
- VIII. Use technology to explore and express scientific learning
- IX. Increase natural curiosity about and observation of the world
- X. Describe, explain, and predict natural phenomena
- XI. Understand that God calls us to care for His creation
- XII. Understand their responsibility to take care of their own physical and spiritual well being

### **Health/Wellness**

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.

### **Health/Wellness**

- 9. **Describe** the effects of noise pollution and **construct** a plan to reduce and protect oneself from noise pollution
- 10. **Demonstrate** heat transfer from one object to another
- 11. **Explain** that electricity is the flow of electrons
- 12. **Describe** the two forms of electricity: static and current
- 13. **Demonstrate** that an electronic current will produce a magnetic field and a moving magnetic field will produce an electric current
- 14. **Describe** electronic currents
- 15. **Describe** heat as energy
- 16. **Demonstrate** the transference of heat from warmer to cooler objects
- 17. **Identify** sources of energy used throughout the world
- 18. **Explain** the need to balance procuring energy with the responsibility to protect God’s creation
- 19. **Design** protective gear for coal, oil, electrical, and nuclear workers and **evaluate** for effectiveness
- 20. **Demonstrate** a simple motor
- 21. **Describe** the effects of an oil spill in the environment when energy sources are not handled properly

### **To describe and demonstrate how electric and magnetic energy can be transferred and transformed.**

The student will:

- 1. **Describe** how batteries and wires can transfer energy to light a light bulb
- 2. **Explain** how simple electrical circuits can be used to determine which materials conduct electricity
- 3. **Describe** the properties of magnets and how they can be used to identify and separate mixtures of solid materials

### **To know how specific behaviors affect health.**

The students will:

- 1. Name 2 specific behaviors and their effect on health (i.e., hand washing, brushing/flossing, too little sleep, insufficient exercise, etc.)
- 2. Describe and role play personal hygiene

- VII. Advocate for personal, family, and community health and wellness.

### **QUARTER 3**

- I. Connect concepts and skills learned in science with their responsibilities as Catholics towards all of Creation
- II. Make observations and ask questions about objects, organisms, and the environment
- III. Gather information, make predictions based on observed patterns and represent the data in graphs and charts (text or electronic)
- IV. Read and write about science and the world using books and technology
- V. Use their senses and standard tools to measure and describe physical properties of matter
- VI. Articulate their observations of the natural world
- VII. Explore and describe the interconnectedness of organisms and their environments
- VIII. Use technology to explore and express scientific learning
- IX. Increase natural curiosity about and observation of the world
- X. Describe, explain, and predict natural phenomena
- XI. Understand that God calls us to care for His creation
- XII. Understand their responsibility to take care

### **Plants & Animals, Organisms & Habitats**

3. Name ways to prevent the spread of germs
4. Identify the difference between communicable diseases and non-communicable diseases
5. Explain the effect of regular physical exercise on personal health

#### **To dialogue about the implications of peer pressure.**

The students will:

1. Explain how peer pressure can affect a person's emotional and physical health

#### **To describe how animals, directly or indirectly depend on plants to provide the food and energy they need in order to grow and survive**

The student will:

1. **Explain** how plants are grouped
2. **Identify** and **illustrate** the parts of the flower
3. **Discuss** how flowers make seeds and fruits
4. **Outline** the life cycle of a flowering plant
5. **Explore** animal characteristics
6. **Analyze** the similarities and differences of animals
7. **Discuss** how organisms obtain energy

#### **To describe how natural phenomena and some human activities may cause changes into habitats and their inhabitants.**

The student will:

1. **Classify** animals with backbones
2. **Observe** how animals respond to stimuli
3. **Explore** how animals hide
4. **Describe** the difference between inherited traits and learned behaviors of organisms
5. **Outline** what structures and behaviors help organisms survive
6. **Discuss** how changes in the environment affect survival
7. **Define** and **describe** various ecosystems
8. **Compare** food chains and food webs (use charts, graphs, etc.)

of their own physical and spiritual well being

### Health/Wellness

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and community health and wellness.

### QUARTER 4

- I. Connect concepts and skills learned in science with their responsibilities as Catholics towards all of Creation
- II. Make observations and ask questions about objects, organisms, and the environment
- III. Gather information, make predictions base on observed patterns and represent the data in graphs and charts (text or electronic)
- IV. Read and write about science and the world using books and technology
- V. Use their senses and standard tools to

### Health/Wellness

**To know how to identify, access, and use good health resources for information.**

The students will:

1. List specific characteristics of useful health information
2. Discuss how TV and other advertising promote smoking and alcohol use
3. Identify and compare and contrast health care agencies, printed material, broadcast media, Internet, other audiovisual materials
4. Identify accurate and inaccurate health information
5. Discuss how media can influence health behaviors
6. Discuss ways technology can positively impact health

**To know that specific behaviors can protect health and safety.**

The students will:

1. Develop a home safety and emergency response plan for fire, medical emergencies; get feedback/sign-off from parents
2. State ways to get help on an emergency at home, in school, in the community
3. Describe bicycle safety rules and ways to prevent injuries
4. Demonstrate basic first aid i.e., your friend falls from his bike, your brother is bitten by a bee, your sister falls from the monkey bars, etc.

### Water Cycle

**To describe how the sun's energy impacts the water cycle**

The student will:

1. **Diagram** and **label** the three layers of the Earth
2. **Research** earthquakes of recent times and **chart** changes brought to the Earth's surface
3. **Create** a model of erosion
4. **Find** and **label** examples of three basic types of rocks
5. **Write** a story about life under the sea including terms from the vocabulary list
6. **Look** up a grocery advertisement and find several products that come from the ocean

- measure and describe physical properties of matter
- VI. Articulate their observations of the natural world
  - VII. Explore and describe the interconnectedness of organisms and their environments
  - VIII. Use technology to explore and express scientific learning
  - IX. Increase natural curiosity about and observation of the world
  - X. Describe, explain, and predict natural phenomena
  - XI. Understand that God calls us to care for His creation
  - XII. Understand their responsibility to take care of their own physical and spiritual well being

### Health/Wellness

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and

### Health/Wellness

7. **Create** a **model** of erosion (virtual or physical)
8. **Draw** pictures of our solar system and all its features and label them
9. **Name** the seasons and **illustrate** where the Earth is in relationship to the sun for each of the seasons
10. **Take** photos of the same beach at different tide levels and discuss the changes observed
11. **Draw** a diagram of the four layers of our Earth's atmosphere

### **To describe and evaluate the effects of alcohol, inhalants, tobacco, and drug use on self, family, and community.**

The students will:

1. Identify and list the impact on self, family, community
2. Explain the long-term consequences of drug use
3. Discuss effect of tobacco and alcohol on body
4. Relay laws related to illegal alcohol and tobacco use
5. List harmful effects of illegal drugs and the impact on community
6. Describe the use/abuse of prescription and over-the-counter medications
7. Describe the difference between medicine and illegal drugs

### **To demonstrate diverse communication techniques**

The students will:

1. Demonstrate appropriate communication with a person who has a speech impairment/defect, a person who is hard of hearing or deaf, a person who does not speak English
2. Create a health message to share with others/community
3. Demonstrate nonviolent conflict resolution
4. Identify obstacles and solutions to communication

**Strategies – Grade 4**

Suggested Teaching Strategies	Suggested Learning Strategies
<p><b>Teacher Directed</b> The teacher:</p> <ul style="list-style-type: none"> <li>• Provides a variety of print materials to engage students in learning about the world around them (Samples:</li> <li>• Provides classroom pets and plants</li> <li>• Creates an environment in which students are encouraged to make observations and predictions</li> <li>• Invites local community resource people (water company, nursery owners, meteorologists, etc.) to enhance learning</li> <li>• Arranges field trips that enhance scientific learning</li> </ul> <p><b>Other:</b> _____ _____ _____</p>	<p><b>Teacher Directed</b> The teacher:</p> <ul style="list-style-type: none"> <li>• Reads nonfiction books to students and relates to the study of science</li> <li>• Provides newspaper and electronic weather reports</li> <li>• Leads students in experiments that demonstrate warm air rising or tornadoes in bottles</li> <li>• Chart and diagram plants that have been watered versus those that have not been watered</li> <li>• Plant seeds and chart growth</li> </ul> <p><b>Other:</b> _____</p> <hr/> <p><b>Cooperative</b> Students:</p> <ul style="list-style-type: none"> <li>• Work together to create charts of things as living and nonliving</li> <li>• Classify plant and animals by physical features</li> <li>• Chart different plants and their uses</li> <li>• Chart clouds</li> </ul> <p><b>Other:</b> _____</p> <hr/> <p><b>Independent</b> Students:</p> <ul style="list-style-type: none"> <li>• Keep personal journals or blogs (Online journals) of scientific observations</li> </ul> <p><b>Other:</b> _____</p>

**Suggested Cross Curricular and Catholic Social Teaching Links**

**Grade Four**

- ✚ Students will write essays explaining how and why we need to balance our use of energy with our responsibility to protect God’s creation. (Religion, Science, Social Studies, Language Arts)

**Notes:**

---

---

---

---

---

**Text/Resources:**

---

---

---

---

---

## GRADE 5 SCIENCE CURRICULUM

DIOCESAN STANDARDS/GOALS	Strand/Topic	Objectives/Enabling Outcomes
<p><b><u>QUARTER 1</u></b></p> <ol style="list-style-type: none"> <li>I. Increase natural curiosity about and observation of the world</li> <li>II. Describe, explain, and predict natural phenomena</li> <li>III. Connect concepts and skills learned in science with an understanding of God as the center of all things</li> <li>IV. Read and write about science and the world using both books and technology</li> <li>V. Answer questions about the natural world based upon observation and investigation</li> <li>VI. Use senses and simple measuring tools to explore the properties of objects</li> <li>VII. Understand the responsibility to take care of their own spiritual and physical well-being</li> <li>VIII. Use technology to explore and express scientific learning</li> </ol>	<p><b>Organisms and Their Survival</b></p>	<p><b>To describe how organisms are structured to ensure efficiency and survival.</b></p> <p>The student will:</p> <ol style="list-style-type: none"> <li>1. <b>Describe</b> how light absorption and reflection allow one to see the shapes and colors of objects</li> <li>2. <b>Describe</b> the structure and function of the human senses and the signals they perceive</li> <li>3. <b>Compare</b> and <b>contrast</b> the structures of the human eye with those of the camera (use charts, graphs, etc.)</li> <li>4. <b>Describe</b> the uses of different instruments, such as eye glasses, magnifier, periscopes and telescopes, to enhance our vision</li> <li>5. <b>Understand</b> that the basic unit of all life is the cell</li> <li>6. <b>Identify</b> and <b>explain</b> the differences between animal and plant cells</li> <li>7. <b>Describe</b> the functions of cells and cell parts</li> <li>8. <b>Explain</b> why cells require energy</li> <li>9. <b>Illustrate</b> how cells get energy from food and how some make food</li> <li>10. <b>Describe</b> the ways that cells work together</li> <li>11. <b>Identify</b> animal tissues and describe how they function in an organism</li> <li>12. <b>Classify</b> and <b>explain</b> the interaction between common tissues found in plants and in animals</li> <li>13. <b>Describe</b> how tissues function and contribute to the survival of an organism</li> <li>14. <b>Define</b> and <b>explain</b> the functions of animal and plant organs</li> <li>15. <b>Know</b> that organs are made up of several different types of tissues that work together to do a specific job</li> <li>16. <b>Identify</b> and <b>describe</b> the major organ systems in plants and animals: circulatory, skeletal, nervous, and transport</li> <li>17. <b>Explain</b> how all living and nonliving things interact with their environment</li> </ol>

18. **Explain** how organisms survive in different environments according to their ability to adapt
19. **Describe** how a habitat and a niche relate to an ecosystem
20. **Know** and **research** current population and density on changes occurring in various ecosystems
21. **Define** adaptation
22. **Compare** and **contrast** the response of organisms to their environment (use charts, graphs, etc.)
23. **Illustrate** the different recycling processes that are likely to occur in the different ecosystems

**Health/Wellness**

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and community health and wellness

**Health /  
Wellness**

**To communicate the value of exercise and activity for a healthy lifestyle.**

The students will:

1. Examine cause and effect of healthy active life and inactivity
2. Differentiate between health-related and skill-related physical activities
3. Discuss strategies for managing stress and importance of exercise and recreational activities
4. Identify the effects of physical activity on cardiovascular system
5. Discuss the importance of developing and maintaining a positive self-image

**To discuss and state causes and prevention of certain infectious diseases.**

The students will:

1. Relate hygiene practices and immunizations to the prevention of common infectious diseases
2. Discuss how polio has been controlled in the U.S. and other parts of the world, and where it still occurs today
3. Name respiratory infectious diseases caused by viruses and by bacteria and how they can be prevented and treated

**To define and apply ways to maintain health. *(on-going all year)***

The students will:

**QUARTER 2**

- I. Increase natural curiosity about and observation of the world
- II. Describe, explain, and predict natural

**Earth**

- 1. Create personal plans for various situations: home alone, fire in home or school, when approached by a stranger, and bicycle, sports, and swimming safety
- 2. Design a daily menu using current USDA recommendations to make healthy food choices
- 3. Describe and demonstrate healthy care of teeth
- 4. Know how to check heart and respiratory rates before and after exercise
- 5. Track and graph hours of sleep for a week or two weeks
- 6. Discuss in small groups ways to manage stress and anger; share with whole group

**To explain how peers, family, and community groups work together to build a healthy community. (on-going all year)**

The students will:

- 1. List various pollutants and how they enter and affect the environment
- 2. Identify actions that protect the environment such as recycling, proper waste disposal, neighborhood clean-up days, etc.
- 3. Track waste at lunch and in the classroom; develop ways to reduce it
- 4. Describe the relationship between safe school/community and the students' health: role play ways to deal with bullying, develop recess rules to promote safety
- 5. Discuss sensitivity, respect, and celebration for Christian and non-Christian customs and traditions
- 6. Examine and promote the value of community health and wellness
- 7. Develop a community health project
- 8. Develop a class project whereby students actively volunteer in a service oriented project in the school, parish, and/or community
- 9. Promote idea of volunteerism and community service

**To describe how the position of Earth in the solar system affects conditions on our planet.**

The student will:

- 1. **Explain** the revolution of the Earth and other planets around the sun
- 2. **Explain** how the rotation of Earth on its axis causes day and night

phenomena

- III. Connect concepts and skills learned in science with an understanding of God as the center of all things
- IV. Read and write about science and the world using both books and technology
- V. Answer questions about the natural world based upon observation and investigation
- VI. Use senses and simple measuring tools to explore the properties of objects
- VII. Understand the responsibility to take care of their own spiritual and physical well-being
- VIII. Use technology to explore and express scientific learning

### Health/Wellness

- I. Identify and demonstrate health promotion

3. **Know** what makes up the solar system
4. **Explain** how gravity affects the Earth and the its atmosphere
5. **Know** the properties of air
6. **Use** different instruments (the anemometer, barometer, Beaufort scale) to measure the properties of air
7. **Illustrate** how changes in the air affect the weather
8. **Explain** how temperature changes with elevation
9. **Define** atmosphere, and label the different layers of Earth's atmosphere
10. **Identify** the atmosphere's chemical components
11. **Describe** how the sun warms the Earth and **explain** how the sun affects weather
12. **Explain** the difference between weather and climate
13. **Describe** how climate affects the weather
14. **Define** a weather front and its impact on weather and **explain** the relationship of humidity and air pressure to weather changes
15. **Describe** how the different cloud formations are affected by water vapor and ice
16. **List** the types of severe weather and their causes
17. **Explain** where Earth's water is located
18. **Explain** how water moves into the atmosphere from the Earth's surface and how water moves from the atmosphere to the Earth's surface
19. **Identify** the parts of the water cycle
20. **Explain** why the relative humidity of air is important to the water cycle
21. **Identify** the features found on the ocean floor
22. **Explain** the interaction between ocean currents and waves
23. **Explain** how earthquakes happen and their results
24. **Describe** volcanoes and their effects on Earth
25. **Understand** what causes change on beaches
26. **Compare** and **contrast** the effects of erosion on mountains and other landforms (use charts, graphs, etc.)
27. **Explain** how glaciers change landforms over time and **describe** the effects of such changes on the oceans of the Earth
28. **Describe** how minerals and fossil fuels are formed

and disease prevention concepts.

- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and community health and wellness

### **QUARTER 3**

- I. Increase natural curiosity about and observation of the world
- II. Describe, explain, and predict natural phenomena
- III. Connect concepts and skills learned in science with an understanding of God as the center of all things
- IV. Read and write about science and the world using both books and technology
- V. Answer questions about the natural world based upon observation and investigation
- VI. Use senses and simple measuring tools to explore the properties of objects
- VII. Understand the responsibility to take care of their own spiritual and physical well-being
- VIII. Use technology to explore and express scientific learning

### **Health/Wellness**

**To define the effects of the integrated functioning and interrelationships of the body systems.**

The students will:

- 1. Differentiate and explain the relationship among cells, tissues, organs, systems, and organisms
- 2. Show interaction/relationship of various systems

**To critically evaluate, and analyze how print media, broadcast media, and Internet technology influence perceptions of health information.**

The students will:

- 1. Describe the effect of media on health-related behaviors such as dieting, eating disorders, use of acne medication
- 2. Discuss celebrities influence on hairstyles, clothing, body appearance, lifestyle choices, behavior
- 3. Discuss and evaluate strategies for validating health information
- 4. Distinguish between myth and fact related to illness and health

### **Moon, Natural Resources**

**To describe the monthly changes in the appearance of the moon based on the moon's orbit around the Earth.**

The student will:

- 1. **Describe** the phases of the moon
- 2. **Describe** the effects of the moon on Earth's tides
- 3. **Explain** how gravity affects the moon's atmosphere

**To describe how humans have the capacity to affect the quality of our life on Earth.**

The student will:

- 1. **Describe** how minerals and fossil fuels are formed
- 2. **Understand** the importance of conserving natural resources

## Health/Wellness

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and community health and wellness

## QUARTER 4

- I. Increase natural curiosity about and observation of the world
- II. Describe, explain, and predict natural phenomena
- III. Connect concepts and skills learned in science with an understanding of God as the center of all things
- IV. Read and write about science and the world using both books and technology
- V. Answer questions about the natural world based upon observation and investigation
- VI. Use senses and simple measuring tools to explore the properties of objects

## Health/Wellness

### **To identify changes that occur during puberty.**

The students will:

1. Listen to and view audiovisual presentation on physical and emotional changes in boys and girls during puberty
2. Understand the importance of identifying physical and emotional changes that occur with puberty
3. List activities and interests of 5<sup>th</sup> grade boys and girls

### **To know how to access, evaluate, analyze, and use media-related health information.**

The students will:

1. Analyze food labels and fast food menus for nutritional content
2. Convert grams of sugar listed on a soda can and convert to actual sugar
3. Discuss how food labels and advertising can be misleading
4. Describe where health information can be found
5. Discuss strategies for validating health information

## Energy, Matter

### **To determine what the role of energy is in our world.**

The student will:

1. **Describe** the factors that affect the pitch and loudness of sound produced by vibrating objects
2. **Describe** how sound is transmitted, reflected and/or absorbed by different materials
3. **Describe** how light is absorbed and/or reflected by different surfaces
4. **Identify** the physical and chemical properties of matter
5. **Understand** the importance of energy in all of its forms
6. **Define** and **identify** energy according to its function
7. **Explain** how the transfer of energy occurs
8. **Describe** the work of electricity
9. **Explain** the use of fossil fuels and efficiency related to electricity
10. **Define** nuclear energy and **research** how it can be used today

- VII. Understand the responsibility to take care of their own spiritual and physical well-being
- VIII. Use technology to explore and express scientific learning

**Health/Wellness**

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.

**Health/Wellness**

- 11. **Identify** and **describe** alternative energy resources

**To identify physical and chemical properties of matter through observation and experimentation.**

The student will:

- 1. **Describe** the three states of matter (solid, liquid, gas)
- 2. **Record** and **interpret** observations of changes in the various states of matter through experimentation
- 3. **Understand** the difference between a physical change and a chemical change
- 4. **Define** a chemical reaction
- 5. **Describe** a mixture
- 6. **Explain** and **illustrate/demonstrate** the difference between a homogeneous and heterogeneous mixture
- 7. **Describe** a colloid
- 8. **Understand** that all matter is made up of atoms
- 9. **Define** element, and explain how to identify elements
- 10. **Explain** the relationship between compounds and molecules
- 11. **Describe** the structure of compounds, and explain how the elements of properties change when compounds are formed
- 12. **Explain** the classification of elements
- 13. **Use** the periodic table

**To analyze the risks of dependence and addiction associated with the use of alcohol, tobacco, inhalants, and other drugs on the systems of the body.**

The students will:

- 1. Explain short and long term effects of various risk behaviors: effect on academic performance, relationships with family, peers, and other individuals
- 2. Describe ways smoking harms the lungs
- 3. Identify and discuss alternatives to drug and substance use

VI. Use goal-setting and decision-making skills to enhance health.

VII. Advocate for personal, family, and community health and wellness.

4. Discuss strategies for avoiding drugs, weapons, gangs, violence

**To know diverse communication skills to maintain health and safety.**

The students will:

1. Relate communication skills to the social and emotional health of the individual and family
2. List names and phone numbers of individuals or organizations that help a person stay healthy (doctor, church, community agencies, poison control, etc.)
3. Develop and practice ways to say “no” to negative peer pressure
4. Determine: “easy” or “hard” to say no to certain situations; what would make it easier
5. Describe healthy and harmful peer influences

## Strategies – Grade 5

Suggested Teaching Strategies	Suggested Learning Strategies
<p><b>Teacher Directed</b> The teacher:</p> <ul style="list-style-type: none"> <li>• Directs students to current news reports (print/electronic) on developments occurring due to space exploration</li> <li>• Distributes periodically a list of nonfiction reading that relates to major themes (e.g. ' solar system, DNA, technology for 21<sup>st</sup> century)</li> <li>• Provides a variety of materials to engage students in learning about the world in which they live</li> <li>• Provides display space for student collections of soil, rock, shell, and other surface samples</li> <li>• Guides students in the use of research engines to research current data on global warming</li> </ul> <p><b>Other:</b></p> <hr/>	<p><b>Teacher Directed</b> The teacher:</p> <ul style="list-style-type: none"> <li>• Read nonfiction books to students related to the study of science</li> </ul> <p><b>Other:</b> _____</p> <hr/> <p><b>Cooperative</b> Students:</p> <ul style="list-style-type: none"> <li>• Research how solar panels can be used in houses, factories, offices and create a group poster that shows examples of such usage</li> <li>• Investigate the use of levers in history and build a model that illustrates one of these uses</li> <li>• Construct models of cells</li> <li>• Make presentation on how organ systems function in plants/animals</li> <li>• Research and illustrate the interactions that occur in an ecosystem</li> <li>• Make a scale model of the Sun and each of the nine planets</li> <li>• Find pictures of different outdoor scenes and categorize them according to Earth's three different climate zones</li> <li>• Research a well-known volcano gathering data on age, geology and eruptions</li> </ul> <p><b>Other:</b> _____</p> <hr/> <p><b>Independent</b> Students:</p> <ul style="list-style-type: none"> <li>• Writes an essay about the importance of energy (all forms) in his/her daily life</li> <li>• Chooses 12 of the elements from the Periodic Table and makes a flashcard for each one (symbol on one side, name on the other) to test classmates</li> <li>• Keep a journal or blog about what is being learned in science</li> </ul> <p><b>Other:</b> _____</p> <hr/>

## Suggested Cross Curricular and Catholic Social Teaching Links

### Grade Five

- ✚ Students will investigate the life and work of an acknowledged science figure (researcher, inventor, physicist, etc.) and write an essay on how this individual's life and work showed respect for humanity as well as for scientific discovery and progress. (Science, Language Arts, Religion)
- ✚ Students will discuss various forms of carbon and debate which form is more important to our quality of life (e.g., carbon in the form of diamonds or coal?) (Science, Social Studies)
- ✚ Produce a classroom newsletter that focuses on protecting and conserving our natural resources (coastal beach erosion, wildlife habitats, and ways to reuse/recycle). (Science)
- ✚ Students will develop an ongoing list of community service activities that can sensitize them to individual and collective responsibility for caring for local water and other energy-generating resources. (Social Studies, Science, Religion)
- ✚ Students will analyze and debate how the earth's ecosystems can be changed if individuals or groups of people act irresponsibly. (Science, Language Arts, Social Studies)
- ✚ Students will discuss the many effects of pollution on all forms of life and create visuals that illustrate how the local community can protect the health of all of its citizens. (Science, Social Studies, Art)
- ✚ Students write poems/prayers/songs that celebrate the gifts of creation. (Language Arts, Science, Religion)

## Middle School Science

Middle school level science may be presented in either of two ways. Sixth grade instruction may be a continuation of the integrated science basal program used in the intermediate and primary levels. *The recommended methodology is to present a science middle school program that teaches earth science in grade six, life science in grade seven and physical science in grade eight.*

### GRADE 6 SCIENCE CURRICULUM – EARTH SCIENCE

ADH STANDARDS	Strand/Topics	Objectives/Enabling Outcomes
<p><b><u>QUARTER 1</u></b></p> <ul style="list-style-type: none"> <li>I. Connect concepts and skills learned in science with their responsibilities as Catholics towards all of Creation</li> <li>II. Make observations and ask questions about objects, organisms, and the environment</li> <li>III. Gather information, make predictions base on observed patterns and represent the data in graphs and charts (text or electronic)</li> <li>IV. Read and write about science and the world using books and technology</li> <li>V. Use their senses and standard tools to measure and describe physical properties of matter</li> <li>VI. Articulate their observations of the natural world</li> <li>VII. Explore and describe the interconnectedness of organisms and their environments</li> <li>VIII. Use technology to explore and express scientific learning</li> <li>IX. Increase natural curiosity about and observation of the world</li> <li>X. Describe, explain, and predict natural phenomena</li> <li>XI. Understand that God calls us to care for His creation</li> </ul>	<p><b>Structure of the Earth, Tectonic Plates, Geological Features</b></p>	<p><b>To diagram how the structure of Earth includes a crust, mantle, liquid metal outer core, and solid metal inner core.</b> The students will:</p> <ul style="list-style-type: none"> <li>1. show in a cross-section diagram with clear labels the proper proportions for the inner core, outer core, mantle, and crust of Earth</li> </ul> <p><b>To describe how tectonic plates (crust plus upper mantle) move Earth atop a slowly convecting mantle, affecting processes on Earth’s land, oceans, and atmosphere.</b> The students will:</p> <ul style="list-style-type: none"> <li>1. diagram a cross-section with clear labels a spreading ridge and at least 1 plate being subducted beneath an adjacent continent</li> <li>2. describe the type of tectonic boundary in the center of the Atlantic Ocean; describe other places on Earth where this type of tectonic boundary occurs</li> <li>3. describe the tectonic plates that bound the Trans-Himalaya mountain chain and determine what type of tectonic boundary exists there</li> </ul> <p><b>To use maps to show that geologic features of Earth’s surface are often related to plate tectonic boundaries (e.g., mountain ranges, ocean basins, continents).</b> The students will:</p> <ul style="list-style-type: none"> <li>1. describe 2 – 3 examples on Earth where colliding tectonic plates have resulted in the formation of mountain chains</li> <li>2. show on a simple diagram the plates and types of plate tectonic boundaries around North America</li> </ul>

XII. Understand their responsibility to take care of their own physical and spiritual well being

**Health/Wellness**

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and

**Health/Wellness**

3. Of the 3 general plate boundaries, give reasons for which of these best matches the East African Rift Valley

**To describe geologic evidence that many Earth processes occurring today (e.g., erosion, sedimentation, volcanism) are similar to those that occurred in the geologic past.**

The students will:

1. Describe how inter-layered sandstone and siltstone with plant and dinosaur fossils would provide a geologist with information about river environments in the Mesozoic
2. Compare how a geologist would use evidence from modern beach and sand dune settings to understand and interpret a sandstone in the geologic record

**To know the structure, function, and interrelationship among body systems.**

The students will:

1. Diagram and label body systems and sense organs
2. Describe and analyze the relationships among body organs
3. Describe changes in male and female bodies in puberty
4. Explain relationship between dietary guidelines to eating habits and physical fitness
5. Explain the relationship of drugs, alcohol, tobacco, inhalants to human body functioning

**To describe the connections between mental, emotional, social, and physical development as they relate to adolescence.**

The students will:

1. Discuss the effects of stress
2. Demonstrate actions that reflect respect for individual differences
3. List the positive and negative responses to criticism
4. Discuss in small groups and share with the whole class the effects of peer pressure
5. Describe the importance of personal hygiene
6. Define issues related to body image and weight management, including eating disorders

community health and wellness.

## **QUARTER 2**

- I. Connect concepts and skills learned in science with their responsibilities as Catholics towards all of Creation
- II. Make observations and ask questions about objects, organisms, and the environment
- III. Gather information, make predictions based on observed patterns and represent the data in graphs and charts (text or electronic)
- IV. Read and write about science and the world using books and technology
- V. Use their senses and standard tools to measure and describe physical properties of matter
- VI. Articulate their observations of the natural world
- VII. Explore and describe the interconnectedness of organisms and their environments
- VIII. Use technology to explore and express scientific learning
- IX. Increase natural curiosity about and observation of the world
- X. Describe, explain, and predict natural phenomena
- XI. Understand that God calls us to care for His creation
- XIII. Understand their responsibility to take care of their own physical and spiritual well being

### **Atmosphere & Hydrosphere, Fossils, Natural Disasters**

#### **To identify key parts of the atmosphere (e.g., layers, composition) and hydrosphere (e.g., oceans, ice caps, waters on land).**

The students will:

1. diagram in cross-section with clear labels the main layers and thicknesses of the atmosphere
2. sketch and describe in a table the 4 to 5 main parts of the hydrosphere and estimate their relative sizes
3. use a map of Earth to predict the continents where the 4 to 5 largest bodies of freshwater reside
4. compare and contrast ice and ice caps in the Arctic region versus the Antarctic region (use charts, graphs, etc.)

#### **To provide examples of how fossils are evidence of life and environments that have changed on Earth.**

The students will:

1. Use the wide variety of fossils from the center of North America in the late Mesozoic (Cretaceous) to reconstruct evidence for that environment (e.g., ammonites, mosasaur, plesiosaur, clams, shrimp burrows, fish, giant sharks, large loon-like birds).
2. Using examples from the fossil record, compare and contrast modern environments dominated by mammals with Mesozoic environments dominated by large reptiles. (use charts, graphs, etc.)

#### **Describe examples of how natural and regular Earth events can become natural disasters for humans and describe the causes of those natural events (e.g., earthquakes, floods, tornadoes, hurricanes).**

The students will:

1. Describe a natural disaster in your community and the cause from Earth systems.

### Health/Wellness

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and community health and wellness.

### Health/Wellness

2. Indicate whether you would predict that natural disasters occurred in past geologic settings, and if so, give examples and evidence.

**Describe processes that show interactions in cycles between the geosphere, hydrosphere, atmosphere and biosphere (e.g., rock cycle, water cycle, rock weathering and formation of soil, formation of limestone or coal).**

The students will:

1. describe the formation of coal and how the presence of coal records interactions among the atmosphere, biosphere, hydrosphere, and geosphere

**To apply critical thinking skills and personal management strategies to address issues and concerns related to personal health and well-being.**

The students will:

1. Discuss and identify the importance of significant friends and adult-mentors in their life
2. Explain the relationship between self-image and gang-related behaviors
3. List and demonstrate refusal strategies related to alcohol, tobacco, and other drugs
4. Discuss and visually or orally present the serious consequences resulting from ,misuse of drugs
5. Factually explain prevention and recognition of communicable and non-communicable diseases

**To know the effects of social and cultural effects on health.**

The students will:

1. Identify relationships among body image/self-esteem issues, social expectations and eating habits
2. Discuss social actors causing and resulting from drug use and alcohol abuse
3. Identify ways peer relationships affect personal health

### QUARTER 3

- I. Connect concepts and skills learned in science with their responsibilities as Catholics towards all of Creation
- II. Make observations and ask questions about objects, organisms, and the environment
- III. Gather information, make predictions based on observed patterns and represent the data in graphs and charts (text or electronic)
- IV. Read and write about science and the world using books and technology
- V. Use their senses and standard tools to measure and describe physical properties of matter
- VI. Articulate their observations of the natural world
- VII. Explore and describe the interconnectedness of organisms and their environments
- VIII. Use technology to explore and express scientific learning
- IX. Increase natural curiosity about and observation of the world
- X. Describe, explain, and predict natural phenomena
- XI. Understand that God calls us to care for His creation
- XIV. Understand their responsibility to take care of their own physical and spiritual well being

### **Earth, Sun, & Solar System**

### **To explore how external and internal sources of energy affect the Earth's systems.**

The student will:

1. **Describe** how folded and faulted rock layers provide evidence of the gradual up and down motion of the Earth's crust
2. **Compare** and **contrast** how weathering and erosion create and shape valleys and floodplains (use charts, graphs, etc.)
3. **Explain** how the boundaries of tectonic plates can be inferred from the location of earthquakes and volcanoes
4. **Explore** and **describe** how the cycling of water in and out of the atmosphere ("the water cycle shapes the face of the Earth)
5. **Explore** how heat flow and movement of materials within the Earth cause the rock cycle, earthquakes and volcanic eruptions
6. **Outline** the major geologic eras in broad terms, citing their time spans and their major forms of life
7. **Identify** fossils and describe how fossil evidence contributes to our knowledge of the earth's evolution and the history of different species

### **Demonstrate that the Sun is a typical star and that Earth is the 3<sup>rd</sup> planet from the Sun in a solar system that includes the Moon, 8 other planets (some with moons), and smaller objects such as asteroids and comets.**

The students will:

1. Develop a diagram to show the key features of the solar system (e.g., planets, some moons, comets, asteroid belt)
2. Show in a diagram which planets the asteroid belt resides between
3. Describe recent key results from research and missions to Mars (e.g., NASA rovers, satellites, planned missions)

### **To describe how the position of Earth in the solar system affects conditions on our planet.**

The student will:

1. **Explain** the effect of gravity on the orbital movement of planets in the solar system
2. **Explain** how the regular motion and relative position of the sun, Earth and moon affect the seasons, phases of the moon and eclipses

## Health/Wellness

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.

## Health/Wellness

3. **Define** gravity as the force that governs the motions of objects in the solar system
4. **Explain** how the motion of the Earth and moon relative to the sun causes daily, monthly and yearly cycles on Earth

**Explain that objects in the solar system have regular and predictable motions due to the force of gravity between these objects, with motions relating to phenomena such as time of day, season, or phase of the Moon.**

The students will:

1. List and diagram some key characteristics of a solar system object with a regular or periodic motion (e.g., include period, position, type of object)
2. Use a diagram with labels to show relative distances of planets and an asteroid belt from the Sun in astronomical units (where 1 AU equals the average distance from Earth to Sun)

**To compare and contrast the Sun as a star with other objects in the Milky Way galaxy (e.g., nebulae, globular clusters, dust clouds, stars, black hole) and describe methods to view and study such features.**

The students will:

1. Show with a simple diagram or map the position of our solar system on a spiral arm and about halfway out from the center of the Milky Way galaxy
2. List in a table the key differences between planets and stars.
3. Describe the significance of a finding in astronomy in the past year that is in the news (e.g., Huygens probe; sighting from Hubble or Spitzer Space Telescope)
4. Describe 3 key events in the history of space exploration
5. List ways that space exploration has benefited humans

**To know the influence of media and technology on health.**

The students will:

1. Identify various media and technologies that influence health
2. Recognize the persuasive tactics used by various types of media including Internet usage/safety

**To Know and analyze information to reduce personal health risks.**

The students will:

1. Demonstrate ways to prevent/respond to deliberate or accidental injuries, conflict resolution, anger management, wearing a seat belt,

- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and community health and wellness.

**QUARTER 4**

- I. Connect concepts and skills learned in science with their responsibilities as Catholics towards all of Creation
- II. Make observations and ask questions about objects, organisms, and the environment
- III. Gather information, make predictions based on observed patterns and represent the data in graphs and charts (text or electronic)
- IV. Read and write about science and the world using books and technology
- V. Use their senses and standard tools to measure and describe physical properties of matter
- VI. Articulate their observations of the natural world
- VII. Explore and describe the interconnectedness of organisms and their environments
- VIII. Use technology to explore and express scientific learning
- IX. Increase natural curiosity about and observation of the world
- X. Describe, explain, and predict natural phenomena
- XI. Understand that God calls us to care for His

**Oceans, Water Cycle**

- etc.
- 2. Write a personal plan for good health (diet, exercise, sleep, etc.)
- 3. Discuss benefits of abstinence from sexual activity

**To describe the water cycle using appropriate terminology and explain conservation and preservation practices.**

The student will:

- 1. **Identify** sources of fresh surface water
- 2. **Explain** the importance of glacier to the freshwater supply
- 3. **Name, locate and describe** the watershed he/she live in
- 4. **Identify** sources of freshwater under the Earth's surface
- 5. **Define** permeability and give examples of materials that are permeable or impermeable
- 6. **Demonstrate** how water is filtered in nature
- 7. **Recognize and explain** differences between artesian wells and other wells
- 8. **Perform** water quality tests and interpret results
- 9. **Relate** water's ability to serve as a solvent to water pollution
- 10. **List** ways to protect freshwater sources

**To identify the earth's oceans as a precious resource that needs to be protected from pollution.**

The student will:

- 1. **Distinguish** between currents, waves, and tides
- 2. **Describe** the movements of warm/cold currents
- 3. **Explain** the impact of ocean currents on weather patterns
- 4. **Explain** the desalination process

creation

- XV. Understand their responsibility to take care of their own physical and spiritual well being

**Health/Wellness**

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and community health and wellness.

**Health/Wellness**

**To know and use a variety of communication skills.**

The students will:

- 1. Practice conflict resolution and mediation skills
- 2. Demonstrate refusal techniques alcohol and tobacco use, sexual activity, other risk-taking behaviors
- 3. Describe positive ways to interact with a person with a disability
- 4. Discuss examples of positive peer pressure

**To evaluate the benefits of becoming a positive role model within the family and the community.**

The students will:

- 1. Demonstrate personal responsibility for exhibiting healthy practices within the school and community setting:
  - a. Virtues (truthfulness, trustworthiness, friendliness, etc/)
  - b. Manners
  - c. Encouragement of others
  - d. Appropriate cooperation and sharing of workload
- 2. Create a whole class service project that will benefit the school and/or community
- 3. Demonstrate increased leadership role participation in the school
- 4. Develop peer mediation techniques
- 5. Demonstrate respect for the opinions and beliefs of other individuals
- 6. Demonstrate respect for rules and regulations



## Strategies – Grade 6

Suggested Teaching Strategies	Suggested Learning Strategies
<p><b>Teacher Directed</b> The teacher:</p> <ul style="list-style-type: none"> <li>• Provides a variety of visual materials that engage students in learning about the world around them</li> <li>• Creates an environment in which students are encouraged to make observations and predictions and to test those predictions</li> <li>• Invites local community resource people to enhance learning</li> <li>• Arranges field trips that enhance scientific learning</li> </ul> <p><b>Other:</b> _____</p> <hr/>	<p><b>Teacher Directed</b> The teacher:</p> <ul style="list-style-type: none"> <li>• Reads nonfiction books and articles with and to students and relates to the study of science</li> <li>• Provides newspaper and electronic weather reports</li> <li>• Leads students in experiments that provide concrete learning experiences</li> <li>• Chart and diagram plants that have been watered versus those that have not been watered</li> <li>• Plant seeds and chart growth</li> </ul> <p><b>Other:</b> _____</p> <hr/> <p><b>Cooperative</b> Students:</p> <ul style="list-style-type: none"> <li>• Work together to create visuals and conduct research and inquiry</li> <li>• Work in cooperative groups to learn and apply content</li> </ul> <p><b>Other:</b> _____</p> <hr/> <p><b>Independent</b> Students:</p> <ul style="list-style-type: none"> <li>• Keep personal journals or blogs (Online journals) of scientific observations</li> </ul> <p><b>Other:</b> _____</p> <hr/>

**Suggested Cross Curricular and Catholic Social Teaching Links**  
**Grade Six**

- ✚ In reading science related materials, students write essays about the application of Church teaching to scientific advances. (Science, Language Arts, Religion)
- ✚ As they study ancient cultures, sixth graders discuss, debate, and write essays about what motivates scientific discovery. (Science, Language Arts, Social Studies)

**Notes:**

---

---

---

---

**Text/Resources:**

---

---

---

---

**GRADE 7 SCIENCE CURRICULUM – LIFE SCIENCE**

<b>DIOCESAN STANDARDS/GOALS</b>	<b>Strand/Topic</b>	<b>Objectives/Enabling Outcomes</b>
<p><b><u>QUARTER 1</u></b></p> <ul style="list-style-type: none"> <li>I. Identify questions that can be answered through scientific investigation</li> <li>II. Read, interpret and examine the credibility of scientific claims in different sources of information</li> <li>III. Design and conduct appropriate types of scientific investigations to answer different questions</li> <li>IV. Identify independent and dependent variables, and those variables that are kept constant, when designing an experiment</li> <li>V. Use appropriate tools and techniques to make observations and gather data</li> <li>VI. Use mathematical operations to analyze and interpret data</li> <li>VII. Identify and present relationships between variables in appropriate graphs</li> <li>VIII. Draw conclusions and identify sources of error</li> <li>IX. Provide explanations to investigated problems or questions</li> <li>X. Communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic</li> </ul>	<p><b>Cells</b></p>	<p><b>To describe how all organisms are made up of one or more cells that have common structures to maintain life.</b>            The student will:</p> <ul style="list-style-type: none"> <li>1. <b>Trace</b> the development of cell theory</li> <li>2. <b>Explore</b> and describe the structures and function of a basic animal cell (e.g. nucleus, cytoplasm, mitochondria, and cell membrane)</li> <li>3. <b>Explain</b> how all organisms are composed of one or more cell; each cell carries on life-sustaining functions</li> <li>4. <b>Compare</b> the energy process of the cell</li> </ul> <p><b>To explain that all living things are composed of cells (i.e., “the building blocks of life”) and that cells carry out the functions needed to sustain life (e.g., photosynthesis in plants).</b>            The students will:</p> <ul style="list-style-type: none"> <li>1. Describe examples of the different types of cells found in living organisms (plants and animals) and their role in maintaining the organism’s well-being.</li> <li>2. Diagram how cells make up tissues in organs</li> </ul> <p><b>To describe that regulation for organisms involves sensing their surroundings (external environment) and then using physiological activities at the cell or organism level to survive.</b>            The students will:</p> <ul style="list-style-type: none"> <li>1. Describe how an organism, including a human, has systems and mechanisms that sense when something invades the body (e.g., cold virus) which activates chemical and physical responses to neutralize the invader’s effect upon the cells, system, and so on</li> </ul> <p><b>To describe the cause and transmission of bacterial and viral diseases and how to prevent, treat, and cure many diseases.</b>            The student will:</p> <ul style="list-style-type: none"> <li>1. <b>Describe</b> the cause and spreading mechanism of viral and bacterial</li> </ul>

<p><b><u>Health/Wellness</u></b></p> <ol style="list-style-type: none"> <li>I. Identify and demonstrate health promotion and disease prevention concepts.</li> <li>II. Access and utilize valid health information and health promoting products and services.</li> <li>III. Practice behaviors that promote health and reduce health risks.</li> <li>IV. Analyze the influence of culture, media, technology, and other actors on health.</li> <li>V. Utilize social and communication skills to enhance health.</li> <li>VI. Use goal-setting and decision-making skills to enhance health.</li> <li>VII. Advocate for personal, family, and community health and wellness.</li> </ol>	<p><b>Health/Wellness</b></p>	<p>diseases</p> <ol style="list-style-type: none"> <li>2. <b>Explore</b> and <b>explain</b> the role of the immune system and how vaccination and antibiotics are used to enhance the fight against infectious diseases</li> </ol> <p><b>To know the body systems and their interrelationships.</b> The students will:</p> <ol style="list-style-type: none"> <li>1. Review body systems: cardiovascular, respiratory, digestive, neuromuscular, skeletal, urinary</li> </ol> <p><b>To know risk factors and characteristics of various diseases.</b> The students will:</p> <ol style="list-style-type: none"> <li>1. Identify risk factors for asthma, the effect of asthma on a person, and treatments</li> <li>2. List significant health risks during adolescence</li> <li>3. Describe common eating disorders</li> <li>4. Describe common dental problems and their prevention and treatment</li> <li>5. Identify causes, symptoms, and treatments of infectious diseases</li> </ol>
<p><b><u>QUARTER 2</u></b></p> <ol style="list-style-type: none"> <li>I. Identify questions that can be answered through scientific investigation</li> <li>II. Read, interpret and examine the credibility of scientific claims in different sources of information</li> <li>III. Design and conduct appropriate types of scientific investigations to answer different questions</li> </ol>	<p><b>Organ Systems</b></p>	<p><b>To describe how many organisms, including humans, have specialized organ systems that interact with each other to maintain dynamic internal balance.</b> The student will:</p> <ol style="list-style-type: none"> <li>1. <b>Describe</b> how multi-cellular organisms need specialized structures and systems to perform basic life functions</li> <li>2. <b>Describe</b> the structures of the human digestive, respiratory, and circulatory systems, and explain how they function to bring oxygen and nutrients to the cells and expel waste materials</li> <li>3. <b>Explain</b> how the human muscular-skeletal system supports the body</li> </ol>

- IV. Identify independent and dependent variables, and those variables that are kept constant, when designing an experiment
- V. Use appropriate tools and techniques to make observations and gather data
- VI. Use mathematical operations to analyze and interpret data
- VII. Identify and present relationships between variables in appropriate graphs
- VIII. Draw conclusions and identify sources of error
- IX. Provide explanations to investigated problems or questions
- X. Communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic

### **Health/Wellness**

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.

### **Health/Wellness**

and allows movement

### **To describe levels of organization for living systems, starting with cells, then moving to tissues, organs, organ systems, whole organisms, populations, and ecosystems**

The students will:

- 1. Determine which is the more complex of 2 levels of complexity and provide evidence (e.g., blood cells or muscle, heart or respiratory system).
- 2. Using a graphic of an ecosystem, distinguish populations of organisms and describe 2 abiotic factors typical of that particular ecosystem.

### **To describe human systems for digestion, respiration, reproduction, blood circulation, excretion, movement and coordination, and protection from disease and ways that these systems interact**

The students will:

- 1. Identify the function of the structures (organs) within the various body systems and the function of each system in the human body.
- 2. Describe the role of each system in the human body and the role that each plays in maintaining the good health of the individual

### **To describe behavior as an organism's response to internal or external stimuli and that all organisms must obtain and use resources, grow, reproduce, and maintain internal conditions.**

The students will:

- 1. Describe examples of structures and systems that enable organisms to respond to stimuli in their environments
- 2. Develop a diagram to depict key parts of the nervous systems in humans (e.g., eyes, neurons in the skin, the inner ear, receptors in internal organs)
- 3. Consider a stomachache and describe pathways for this as an internal response to stimuli from something you ingested

### **To know the effects of drugs and alcohol on choices and behavior.**

The students will:

- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and community health and wellness.

### **QUARTER 3**

- I. Identify questions that can be answered through scientific investigation
- II. Read, interpret and examine the credibility of scientific claims in different sources of information
- III. Design and conduct appropriate types of scientific investigations to answer different questions
- IV. Identify independent and dependent variables, and those variables that are kept constant, when designing an experiment
- V. Use appropriate tools and techniques to make observations and gather data
- VI. Use mathematical operations to analyze and interpret data
- VII. Identify and present relationships between variables in appropriate graphs
- VIII. Draw conclusions and identify sources of error
- IX. Provide explanations to investigated problems or questions

### **Reproduction, Heredity, Adaptation, & Survival**

- 1. Recognize risky or harmful behaviors
- 2. identify factors that affect school success
- 3. list activities in early adolescence and possible effects of substance on activity

#### **To know that mind and body interrelate.**

The students will:

- 1. identify the relationship between stress and physical illness
- 2. describe ways to cope with stress, with physical illness
- 3. identify personal health risks and develops a comprehensive plan for good health
- 4. distinguish between healthy and unhealthy responses to stress

#### **To explain how reproduction is a characteristic of all living systems, with some organisms reproducing asexually and others reproducing sexually (through egg and sperm).**

The students will:

- 1. Distinguish and describe the difference between asexual reproduction and sexual reproduction.
- 2. Research and discuss disease prevention and care associated with the human reproductive system

#### **To describe heredity as the passage of genetic information from one generation to the next**

The students will:

- 1. Using examples of family pedigrees for traits such as red-green color blindness or hemophilia, describe examples of genetic characteristics transmitted to offspring

#### **To compare features of organisms for their adaptive, competitive, and survival potential (e.g., appendages, reproductive rates, camouflage, defensive structures).**

The students will:

- 1. After comparing such things as skulls, teeth, and the location of the eyes on various predator and prey organisms, recognize and describe

- X. Communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic

### Health/Wellness

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.

### Health/Wellness

how these features contribute to the individual organism's lifestyle and ability to survive

#### **To describe the unity of organisms by studying their similar internal structures, chemical processes, and evidence of common ancestry**

The students will:

1. After examining the skeletal structure of related organisms (e.g., wolves, coyotes, and foxes), recognize and describe the close similarities of structures as evidence of a common ancestry

#### **To describe how natural selection in the environment (e.g., by predators, climate change) leaves individuals more apt to survive and to pass on their genes to offspring**

The students will:

1. Describe and predict how individual organisms of a population might react when subject to significant changes in their environment (e.g., a prolonged drought or parasitic infestation)
2. Give examples of how individual organisms that survive to reproduce transmit their genetic traits, whereas individuals that do not survive to breed have their traits removed from the genetic pool

#### **To describe that genetic information is contained in genes and that traits are determined by one or more genes**

The students will:

1. Describe examples of inherited characteristics that are determined by one or more genes from parents

#### **To know effective communication skills applied to health topics.**

The students will:

1. Compare and contrast positive versus negative peer pressure as related to health and safety (use charts, graphs, essays, etc.)
2. Demonstrate effective communication skills (verbal and nonverbal) to enhance health and safety

- VII. Advocate for personal, family, and community health and wellness.

#### **QUARTER 4**

- I. Identify questions that can be answered through scientific investigation
- II. Read, interpret and examine the credibility of scientific claims in different sources of information
- III. Design and conduct appropriate types of scientific investigations to answer different questions
- IV. Identify independent and dependent variables, and those variables that are kept constant, when designing an experiment
- V. Use appropriate tools and techniques to make observations and gather data
- VI. Use mathematical operations to analyze and interpret data
- VII. Identify and present relationships between variables in appropriate graphs
- VIII. Draw conclusions and identify sources of error

#### **Ecosystems**

3. Demonstrate the ability to make individual and group decisions by evaluating alternatives, predicting consequences of decisions, choosing a plan, informing proper authorities when necessary, evaluating the decision and using information as a basis for future decisions, and listening to conscience, not following blindly

#### **To know own role in family health issues.**

The students will:

1. Describe ways to help own family stay healthy
2. Demonstrate basic knowledge of nutrition, first aid skills, baby-sitting safety and skills
3. Describe the need for and use of protective gear (e.g., bicycle helmet, seat belts, etc.)
4. Create a family plan for natural emergency situations such as hurricanes, fires, winter storms, electrical outage, floods, etc.

#### **To use examples to show that populations of plants or animals consist of all individuals that occur together in a region**

The students will:

1. Identify some of the plant and animal populations occurring on your school site or nearby park
2. Describe 2 examples of a population that consists of all the plants or animals of the same kind (e.g., all the dandelions in a field are a population of dandelions; all the robins in a park make up a population of robins)

#### **To develop a diagram showing sunlight (the major source of energy in ecosystems) entering ecosystems through producers by photosynthesis, then passing to consumers and decomposers through food webs.**

The students will:

1. Diagram the flow of energy through ecosystems, showing the sun as the primary source of the energy
2. Give examples from a park near your school of first-order (primary) consumers in making the sun's energy available to other organisms within the ecosystem through photosynthesis
3. Describe the role of decomposers in cycling the basic chemicals back

- IX. Provide explanations to investigated problems or questions
- X. Communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic

### **Health/Wellness**

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.

### **Health/Wellness**

to soils for use in photosynthesis

#### **To compare examples of ecosystems with vast numbers of species of animals, plants, and microorganisms in many kinds of habitats**

The students will:

- 1. Use diagrams to show various ecosystems with a diversity in populations that have primary producers, first-order consumers, second-order consumers (etc.) and describe how these populations benefit the health of the ecosystem

#### **To identify and classify key biotic and abiotic interactions in an ecosystem and factors that affect population density**

The students will:

- 1. Identify how changes in abiotic factors such as temperature, loss of soil, and wildfire within an ecosystem may affect the population density of certain organisms within that ecosystem.
- 2. Describe how the introduction of exotic or nonnative species of a plant or animal might have a negative effect on populations occupying the niche that is invaded by the introduced species

#### **To know the advantages of sexual abstinence.**

The students will:

- 1. discuss the importance of abstinence
- 2. discuss the consequences of sexual activity

#### **To work cooperatively with others to support and promote a healthy and Christian spirit in school, family, and community.**

The students will:

- 1. Demonstrate personal responsibility for exhibiting healthy practices within the school and community setting:
  - a. Virtues (truthfulness, trustworthiness, friendliness, etc.)
  - b. Manners
  - c. Encouragement of others
  - d. Appropriate cooperation and sharing of workload
  - e. Volunteering/service
- 2. Define, recognized, and apply the benefits of community and personal service

VII. Advocate for personal, family, and community health and wellness.

3. Create individual and class service project

**GRADE 8 SCIENCE CURRICULUM – PHYSICAL SCIENCE**

DIOCESAN STANDARDS/GOALS	Strand/Topics	Objectives/Enabling Outcomes
<b><u>QUARTER 1</u></b>	<b>The Nature of Matter</b>	<b>To describe some characteristic physical properties of substances that are independent of the mass of the substance (e.g., density, boiling point, solubility)</b>
<ul style="list-style-type: none"> <li>I. Identify questions that can be answered through scientific investigation</li> <li>II. Read, interpret and examine the credibility of scientific claims in different sources of information</li> <li>III. Design and conduct appropriate types of scientific investigations to answer different questions</li> <li>IV. Identify independent and dependent variables, and those variables that are kept constant, when designing an experiment</li> <li>V. Use appropriate tools and techniques to make observations and gather data</li> <li>VI. Use mathematical operations to analyze and interpret data</li> <li>VII. Identify and present relationships between variables in appropriate graphs</li> <li>VIII. Draw conclusions and identify sources of error</li> <li>IX. Provide explanations to investigated problems or questions</li> <li>X. Communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic</li> </ul>		<p>The students will:</p> <ul style="list-style-type: none"> <li>1. Use a graph of measurements for mass versus volume to determine the density of a material</li> <li>2. Describe the change in freezing point that may occur when salt is added to water and why this may occur</li> </ul> <p><b>Show that properties of objects can be measured and recorded with simple tools (e.g., rulers, timers, balances, thermometers)</b></p> <p>The students will:</p> <ul style="list-style-type: none"> <li>1. Measure mass with a balance and geometric dimensions with a ruler, and then determine volume and density for an object (e.g., cube, rectangle)</li> <li>2. Record and plot the change in temperature with time for candle wax and indicate how the graph shows temperature of the liquid-solid transition</li> </ul> <p><b>To describe the properties of matter.</b></p> <p><b>The student will:</b></p> <ul style="list-style-type: none"> <li>1. <b>Classify</b> matter as elements, compounds, mixtures, or solutions</li> <li>2. <b>Describe</b> the parts of the periodic table (families, periods, etc.)</li> <li>3. <b>Develop</b> an understanding of the structure of matter by developing an atomic model (identify the parts, atomic number, atomic mass, and electron energy levels)</li> <li>4. <b>Describe</b> how the properties of simple compounds are different from</li> </ul>

## Health/Wellness

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and community health and wellness.

## QUARTER 2

- I. Identify questions that can be answered

## Health/Wellness

### **To identify and define factors that affect health.**

The students will:

1. Review interrelationships among the body systems
2. Describe mind/body relationship in health and disease
3. Identify mental health issues such a depression, suicide, eating disorders
4. Identify risk factors for one specific contagious and one non-contagious disease: pathogenic, genetic, age-related, cultural, environmental, behavioral

### **To know changes that occur as a person grows older.**

The students will:

1. Identify the characteristics and stages of human growth and development

- the elements from which they are made
5. **Classify** compounds as acids, bases or salts
  6. **Explain** how mixtures can be separated by using the properties of the substances from which they are made, such as particle size, density, solubility, and boiling point
  7. **Distinguish** between organic and inorganic compounds
  8. **Balance** chemical equations
  9. **Explain** the Law of Conservation of Energy
  10. **Explain** the processes of synthesis, decomposition and replacement

## Chemistry

### **Explain that substances react chemically in characteristic ways with other substances to form new substances with different characteristic properties**

The students will:

- through scientific investigation
- II. Read, interpret and examine the credibility of scientific claims in different sources of information
  - III. Design and conduct appropriate types of scientific investigations to answer different questions
  - IV. Identify independent and dependent variables, and those variables that are kept constant, when designing an experiment
  - V. Use appropriate tools and techniques to make observations and gather data
  - VI. Use mathematical operations to analyze and interpret data
  - VII. Identify and present relationships between variables in appropriate graphs
  - VIII. Draw conclusions and identify sources of error
  - IX. Provide explanations to investigated problems or questions
  - X. Communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic

### **Health/Wellness**

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and

1. Analyze and write down reactants and suggest what might be the products for the chemical reaction between baking soda and vinegar
2. List ingredients to make gelatin and compare the properties of these materials at different temperatures with the properties of gelatin when it is made

### **To be able to provide examples of how total mass is conserved in chemical reactions (e.g., combustion, rusting, antacid tablet reaction)**

The students will:

1. Measure, compare, and document reactants and products when adding 2 antacid tablets to a certain amount of water

### **To describe simple patterns in the periodic table of elements that relate to the physical properties of matter (e.g., solids, gases; metals, nonmetals)**

The students will:

1. Circle the general region of the periodic table where gases or metals reside
2. Write a pattern that you see for atomic mass in the periodic table of the elements

### **To describe evidence that in most chemical reactions, energy is transferred either into or out of the system (evidence in heat or temperature, light, mechanical motion, electricity)**

The students will:

1. Describe and show how the combustion of natural gas (mostly methane, propane) releases energy that humans can use
2. Use the photosynthesis reaction to show an understanding of energy transfer in a chemical reaction
3. Summarize qualitatively the flow of energy in the reaction that occurs when molten rock (lava) becomes a hardened rock consisting of minerals

### **To know the positive effects of health care and healthy habits and the implications of unhealthy choices.**

The students will:

1. Discuss how immunizations in childhoods and thru life promote health

### **Health/Wellness**

reduce health risks.

- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and community health and wellness.

- 2. Review appropriate health care and healthy personal habits that prevent illness and premature disability and death
- 3. Describe the effects of tobacco, alcohol, and other chemical substances on the individual

**To know ways to assure the health and safety of self and others**

The students will:

- 1. Demonstrate ways to avoid or change situations, including dating or other social relationships, that might threaten personal safety
- 2. List and describe the value of preventive health measures: immunizations, periodic medical and dental examinations, avoid risk behaviors
- 3. Research and discuss the recommended frequency of preventive health care
- 4. Describe strategies that show respect for individual choices and differences, including age in making health decisions
- 5. Update personal health plan and explain any changes; distinguish between short-term and long-term goals
- 6. Describe the personal benefit of avoiding sexual activity, tobacco and illegal drug use

**QUARTER 3**

- I. Identify questions that can be answered through scientific investigation
- II. Read, interpret and examine the credibility of scientific claims in different sources of information
- III. Design and conduct appropriate types of scientific investigations to answer different questions
- IV. Identify independent and dependent variables, and those variables that are kept constant, when designing an experiment
- V. Use appropriate tools and techniques to make observations and gather data
- VI. Use mathematical operations to analyze and interpret data
- VII. Identify and present relationships between

**Force, Motion**

**To describe ways that forces can affect motion (e.g., action/reaction, equilibrium conditions, free-falling objects, rockets).**

The students will:

- 1. List and describe 3 everyday examples of ways that friction or air resistance affects the motions of common objects

**To describe and use graphs to show the motion of an object with position, direction, and speed.**

The students will:

- 1. Measure, tabulate results, and graph findings for position and time of an object with motions such as free falls, periodic motions of a spring or a pendulum, or projectile paths

**Explain the factors that affect the gravitational forces on objects (e.g., changes in mass, distance) and use classic experiments to demonstrate gravitational or electromagnetic forces (e.g., pendulum)**

The students will:

- variables in appropriate graphs
- VIII. Draw conclusions and identify sources of error
  - IX. Provide explanations to investigated problems or questions
  - X. Communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic

1. Measure pendulum period as a function of length,  $L$ , and describe in words the relationship you see from a graph
2. Measure position as a function of time for an object accelerating due to gravity (e.g., ball on ramp) and describe the change in slope (velocity) on a graph of position as a function of time

**To describe how energy provides the ability to do work and can exist in many forms.**

The student will:

1. **Explain** the relationship among force, distance and work, and use the relationship ( $W=F \times D$ ) to calculate work done in lifting heavy objects
2. **Explain** how simple machines, such as inclined planes, pulleys and levers, are used to create mechanical advantage
3. **Describe** how different types of stored (potential) energy can be used to make objects move.
4. **Compare** and **contrast** the various forms of energy (heat, light, sound, electrical, magnetic, mechanical, and nuclear)
5. **Demonstrate** an understanding of forces in fluids (Pascal's Principle, Archimedes' Law, Bernoulli's Principle, and hydraulics)
6. **Use analyze**, and **interpret** efficiency and power mathematical operations to calculate,
7. **Explain** how beam, truss, and suspension bridges are designed to withstand the forces that act on them

**To describe how an object's inertia causes it to continue moving the way it is moving unless it is acted upon by a force to change its motion.**

The student will:

1. **Describe** Newton's Laws of Motion
2. **Describe** the qualitative relationships among force, mass, and changes in motion
3. **Describe** the forces acting on an object moving in a circular path
4. **Calculate** the average speed of a moving object and illustrate the motion of objects in graphs of distance over time
5. **Describe** the motion of an object by its position, direction of motion, and speed

## Health/Wellness

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media, technology, and other actors on health.
- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and community health and wellness.

## QUARTER 4

- I. Identify questions that can be answered through scientific investigation
- II. Read, interpret and examine the credibility of scientific claims in different sources of information

## Health/Wellness

6. **Explain** how an unbalanced force acting on an object changes its speed and/or direction
7. **Explore** and **explain** how to measure the speed of objects in motion, calculate average speed, and illustrate the motion of objects in graphs of distance over time

### **To know how to access, evaluate, and use health information.**

The students will:

1. Develop, research, and apply evaluation criteria for examples of health information from TV, periodicals, and/or the Internet
2. Describe the appropriate use of specific health information obtained from TV, periodicals, and/or the Internet
3. List and analyze ways that information, ideas, and opinions about health issues can be communicated

### **To investigate and evaluate ways in which peers, families, and other community groups can work together to build a safe and healthy community.**

The students will:

1. Display personal responsibility for exhibiting healthy practices within the school and community setting:
  - a. Virtues (truthfulness, trustworthiness, friendliness, etc.)
  - b. Manner
  - c. Encouragement of others
  - d. Appropriate cooperation and sharing of workload
  - e. Volunteering
2. Create class and individual opportunities for Christian community service

## Energy, Electricity, Magnetism

### **To describe how energy is a property of substances that is associated with heat, light, solar radiation, electricity, mechanical motion, sound, and chemical substances**

The students will:

1. Design an experiment to show that producing sound must involve the transfer of energy
2. Design an experiment to demonstrate that either giving an object

- III. Design and conduct appropriate types of scientific investigations to answer different questions
- IV. Identify independent and dependent variables, and those variables that are kept constant, when designing an experiment
- V. Use appropriate tools and techniques to make observations and gather data
- VI. Use mathematical operations to analyze and interpret data
- VII. Identify and present relationships between variables in appropriate graphs
- VIII. Draw conclusions and identify sources of error
- IX. Provide explanations to investigated problems or questions
- X. Communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic

### Health/Wellness

- I. Identify and demonstrate health promotion and disease prevention concepts.
- II. Access and utilize valid health information and health promoting products and services.
- III. Practice behaviors that promote health and reduce health risks.
- IV. Analyze the influence of culture, media,

motion or stopping the motion of an object requires energy

**To describe some of the physical and chemical processes that are used to produce energy and how society uses this natural resource.**

The students will:

1. Beginning with photosynthesis in plants, describe and diagram qualitatively why coal can be a source of energy for society

**To diagram examples of how waves carry energy and transfer energy when they interact with matter (e.g., seismic, light, electromagnetic, sound)**

The students will:

1. Use a diagram and describe the interaction of energy and matter when a bright lamp shines on 2 metal cans, one covered with black paper and the other covered with white paper (or conduct and analyze the experiment)

**Show that heat can be transferred between objects in predictable ways (flows from hot to cold).**

The students will:

1. Compare the rate of flow of heat along rods made of metal and glass
2. Use a diagram with clear labels to describe the flow of energy when boiling water on a stove, starting from an energy source (e.g., electricity or natural gas) in a house to steam above a kettle

**To describe how energy provides the ability to do work and can exist in many forms.**

The student will:

1. **Compare** and **contrast** ways to produce electrical energy
2. **Describe** how magnetic fields produce an electric current
3. **Describe** simple, parallel, and series circuits
4. **Define** magnetism relative to the arrangement of electrons
5. **Explain** how electromagnets are produced

technology, and other actors on health.

- V. Utilize social and communication skills to enhance health.
- VI. Use goal-setting and decision-making skills to enhance health.
- VII. Advocate for personal, family, and community health and wellness.

<b>Health/Wellness</b>	<p><b>To know the effect of health/lack of health beyond one’s own self.</b></p> <p>The students will:</p> <ol style="list-style-type: none"> <li>1. Identify specific local environmental health threat</li> <li>2. Relate issues such as anger management and gun control to personal, family, and community health</li> <li>3. Discuss significant health issues in developing countries</li> </ol>
------------------------	--

**Strategies – Grade 7&8**

Suggested Teaching Strategies	Suggested Learning Strategies
<p><b>Teacher Directed</b> The teacher:</p> <ul style="list-style-type: none"> <li>• Provides a variety of materials that engage students in learning about the world in which they live</li> <li>• Guides students in the use of research engines to research current scientific data</li> <li>• Models an appreciation of God’s complex organization of matter</li> </ul> <p><b>Other:</b></p> <p>_____</p> <p>_____</p> <p>_____</p>	<p><b>Teacher Directed</b> The teacher:</p> <ul style="list-style-type: none"> <li>• Plans field trips to enhance learning</li> <li>• Invites professionals in the scientific field to the classroom</li> <li>• Employs cross-curricular teaching connections (graphing, balancing equations, researching scientists, developing time lines, current events)</li> </ul> <p><b>Other:</b> _____</p> <p>_____</p> <p>_____</p> <p><b>Cooperative</b> Students:</p> <ul style="list-style-type: none"> <li>• Construct a periodic table from atomic models</li> <li>• Organize the atomic models according to similarities</li> <li>• Design and build a machine to solve a problem</li> <li>• Illustrate chain reactions using dominoes</li> <li>• Conduct a school wide survey of selected traits (rolling tongue, earlobe attachment, etc.)</li> </ul> <p><b>Other:</b> _____</p> <p>_____</p> <p>_____</p> <p><b>Independent</b> Students:</p> <ul style="list-style-type: none"> <li>• Design a chart showing the photosynthesis and respiration relations</li> <li>• Create an imaginary animal that is a cross between any two designated animals/plants</li> </ul>

- Trace a particular trait in your family tree (left handedness, baldness, color blindness, etc.)
- Explore the contributions of Copernicus, Ptolemy, Kepler and Galileo to Astronomy
- Design an energy chart showing energy flow within the ecosystem
- Design a method of removing an oil spill from the ocean floor

**Other:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

### **Suggested Cross Curricular and Catholic Social Teaching Links Middle School (Grades Six/Seven/Eight)**

- ✚ Students write and perform plays to demonstrate the importance of proper hygiene and care of our bodies for younger students. (Science, Health, Language Arts)
- ✚ Students use online and text resources to research a famous scientist and explain how his/her contributions have added to the quality of life on Earth. (Science, Language Arts)
- ✚ Students formulate a fitness plan to maintain good health. (Science, Health, Language Arts)
- ✚ Write a story such as “I Am a Red Blood Cell” and trace its journey through the body.
- ✚ Student interview transplant patients as part of a case study or essay about the benefits and challenges of technology.
- ✚ Students listen to speeches on the internet with themes centered on environmental issues and use those speeches as models in their own presentation on similar issues. (Social Studies, Science, Religion, Listening Skills)
- ✚ Students read and discuss novels that deal with personal growth, overcoming obstacles, interaction with nature and the environment, the advancement of technology (Hatchet, The Giver, Where the Red Fern Grows, Lyddie), and articulate an understanding of the dignity of the human person and the responsibility of Christians to work for justice in the workplace. (Religion, History, Literature)
- ✚ Students read a variety of nonfiction pieces about environmental issues and natural resources to develop an understanding of themselves as

- guardians of creation. (Science, Religion, Literature)
- ✦ Students research topics for essays in science, history, geography in both text and online sources and consistently observe copyright laws, demonstrating respect for the rights and dignity of others. (History, Geography, Science)
- ✦ Students read and write essays and speeches that connect excessive economic, social and cultural inequalities to conflicts between nations and among peoples (both in the present and past), articulating the link between peace and justice. (Social Studies, Science, Religion, Literature, Written Language)
- ✦ Students write persuasive essays and speeches supporting one political leader over another because he/she better reflects an understanding of society's moral responsibility to use resources well. (Religion, Social Studies, Science, Written Language)
- ✦ Students write short stories describing the consequences of environmental or personal health choices. (Religion, Written Language, Science)
- ✦ Students write about and calculate the environmental and economic cost of war, natural disasters, unemployment, etc.), expressing an understanding that, as Catholic Christians, we are called to work globally and locally for justice. (Math, Social Studies, Science)

### **Sharing Catholic Social Teaching Selected Resources Background for Teachers**

- Compendium of the Social Doctrine of the Church (Pontifical Council for Justice and Peace; Order through USCCB, 1/800-235-8722). Provides a complete and systematic overview of the Church's social teaching with an extensive index for easy reference on almost any topic.
- A Place at the Table: A Catholic Recommitment to Overcome Poverty and to Protect the Dignity of All God's Children (USCCB, 1/800-235-8722). The U.S. bishops remind us that central to our identity as disciples of Jesus Christ is our concern for those who are poor or suffering.
- Faithful Citizenship: A Catholic Call to Political Responsibility (USCCB, 1/800/235-8722) The 2003 bishops' statement includes Church teaching about civic participation, as well as the Church's position on a range of issues.
- The Challenge of Faithful Citizenship (USCCB, 1/800/235-8722) This two-color brochure summarizes the bishops' statement, Faithful Citizenship: A Catholic Call to Political Responsibility and includes "Question for the Campaign" for voters and candidates.

- **Sharing Catholic Social Teaching: Challenges and Directions (USCCB, 800/235-8722)** A statement of the U.S. bishops urging that Catholic social teaching be incorporated into every Catholic educational program. Identifies seven key themes of Catholic social teaching.
- **A Leader’s Guide to Sharing Catholic Social Teaching (USCCB, 800/235-8722)** Step-by-step process to help catechetical leaders and other adults explore Catholic social teaching. Includes camera-ready handouts.
- **Leaven for the Modern World: Catholic Social Teaching and Catholic Education (National Catholic Education Association, 202/337-6232)** A resource designed to help educators at the secondary level deepen their understanding of Catholic social teaching and explore ways to share it with young people.
- **Everyday Christianity: To Hunger and Thirst for Justice (USCCB, 202/835-8722)** The most important way lay Catholics work for justice and peace is through their choices and actions every day.
- **Brothers and Sisters to Us/Nuestros Hermanos y Hermanas (USCCB, 800/235-8722)** The U.S. bishops promote discussion and action against racism.
- **The Challenge of Peace (USCCB, 800/235-8722)** U.S. bishops’ landmark pastoral on nuclear weapons and the arms race.
- **Living the Gospel of Life: A Challenge to American Catholics (USCCB, 800/235-8722)** Calls U.S. Catholics to recover their identity as followers of Jesus Christ and to be leaders in the renewal of U.S. respect for the sanctity of life.
- **Sharing the Light of Faith: An Official Commentary (USCCB, Department of Education, 800/235-8722)** Chapter VII explores Catholic social teaching and guidelines on catechesis for social ministry.
- **Confronting a Culture of Violence: A Catholic Framework for Action (USCCB, 800/235-9722)** This statement recognizes programs in dioceses, parishes and schools across the country.
- **Economic Justice for All: Pastoral Letter on Catholic Social Teaching and the U.S. Economy by the U.S. bishops (USCCB, 800/235-8722)** Resources such as posters and suggestions for using the pastoral letters in the classroom.

- Renewing the Earth (National Catholic Rural Life Conference, 515/270-2634) Study guides for children, teens and adults on the bishops' environment statement. Materials for Classroom and Small Groups
- In the Footsteps of Jesus: Resource Manual on Catholic Social Teaching (USCCB, 800/253-8722) Provides background reading, lesson plans for all ages, camera-ready resource, and other tools. Designed to be used with the video, *In the Footsteps of Jesus*.
- From the Ground Up: Teaching Catholic Social Principles in Elementary Schools (National Catholic Education Association, 202/337-6232) A faculty preparation guide that includes a process for faculty development and sample activities for sharing the seven key themes of Catholic social in grades K through 8.
- Excerpts from Sharing Catholic Social Teaching (USCCB, 800/253-8722) An easy to distribute card summarizing the seven themes of Catholic social teaching. Also available as a poster.
- Making a Place at the Table (USCCB, 1/800235-8722) A brief, compelling, four-panel brochure summarizing the bishops' statement on poverty.
- That's Not Fair! (Tom Turner, Bishop Sullivan Center, 816-231-0984) A complete kit with exercises and handouts to teach middle school students about Catholic social doctrine, culminating in an advocacy/lobbying project on a social justice issue.
- Lesson Plans on Poverty ([www.povertyusa.org](http://www.povertyusa.org)). Lesson plans for grades K-12 and adults developed by the Catholic Campaign for Human Development.
- A Catholic Framework for Economic Life (USCCB, 800/235-8722) A card containing ten key principles of Catholic social teaching on economic life.
- Catholic Call to Justice: An Activity Book for Raising Awareness of Social Justice Issues ([www.usccb.org/CCHD](http://www.usccb.org/CCHD)) A lesson plan designed for ages 14-22 to experience through an obstacle course the major themes of Catholic social teaching.

- Teaching Resources on Sweatshops & Child Labor (Archdiocese of Newark, 973-497-4000) A complete kit including video, background materials, and classroom exercises and handouts to help educators teach about sweatshops and child labor.
- Integrating Catholic Social Teaching in the High School Curriculum: English and Religion (University of St. Thomas, 651-962-5712) A curriculum resource developed by Catholic high school educators.
- Building God’s Kingdom: Implementing Catholic Social Teaching—Resources and Activities for Grades K – 12 (Religious Education Dept., Diocese of Toledo, 419/244-6711) Resources for schools and religious education programs.
- A Good Friday Appeal to End the Death Penalty (USCCB, 800/235-8722) A brochure containing the U.S. bishops’ 1999 statement urging abolition of the death penalty.
- Sharing the Tradition, Shaping the Future (Catholic Campaign for Human Development, 800/541-3212). A small group workbook on seven themes of Catholic social teaching.
- Educating for Peace and Justice: Religious Dimensions, Grades 7-12 and Grades K-6 by James McGinnis (Institutes for Peace and Justice, 314/533-4445)
- Food Fast (Catholic Relief Services, 800/222-0025) Free materials include a detailed coordinator’s manual with an outline for a 24-hour fast and activities that can be used in a classroom setting to explore issues of hunger and poverty.
- Math for a Change/Math for a World that Rocks (Mathematical Teachers’ Association, 847/827-1361) Two booklets that use situations of injustice to apply or illustrate mathematics for grades 8-12.
- Offering of Letters Kit and other resources (Bread for the World, 301/608-2400)
- Operation Rice Bowl (Catholic Relief Services, 800/222-0025) Lenten program of fasting, education, almsgiving and prayer. The free materials include a video and religious educator’s guide.

- Videos *In the Footsteps of Jesus* (USCCB, 800/235-8722) Part I (9 minutes): A compelling overview of seven key themes of Catholic social teaching. Part II (19 minutes): A more in-depth illustration of the seven themes highlighting people who have lived them.
- Faithful Citizenship (USCCB, 800/235-8722) Great for small groups and classes, an appealing video message about the Catholic tradition of political responsibility.
- Global Solidarity (USCCB, 800/235-8722) The U.S. bishops' message of solidarity with our brothers and sisters throughout the world.
- Sisters and Brothers Among Us (Catholic Campaign for Human Development, 202/541-3212) A 16-minute video that tells the story of poverty through the faces and voices of the poor.

#### **Web Sites –**

- [www.usccb.org/sdwp](http://www.usccb.org/sdwp) -- The USCCB Department of Social Development and World Peace website—background information and action alerts on a variety of domestic and international issues, as well as general information on educating for justice and political responsibility.
- [www.usccb.org/faithfulcitizenship](http://www.usccb.org/faithfulcitizenship) --Provides statements from the U.S. bishops and a wide range of resources, including lesson plans for all ages on Faithful Citizenship, Solidarity, Human Dignity, and the Option for the Poor.
- [www.catholicrelief.org/what/advocacy--Up-to-date](http://www.catholicrelief.org/what/advocacy--Up-to-date) information on international public policy issues and how you and your students can act.

- [www.catholiccharitiesusa.org/programs/advocacy](http://www.catholiccharitiesusa.org/programs/advocacy) ---Up-to date information on domestic public policy issues and how you and your students can act. Includes a special section for children/youth and for teachers and catechists.
- [www.povertyusa.org](http://www.povertyusa.org) --Extensive information on poverty in the United States, including lesson plans.
- [www.educationforjustice.org](http://www.educationforjustice.org) --The Center of Concern offers a wide range of educational materials on issues of justice and peace. Membership fee required.
- [www.osjspm.org](http://www.osjspm.org) --The Office for Social Justice of the Archdiocese of St. Paul/Minneapolis offers a variety of first rate resources for justice education, including an annotated bibliography and information on models and ideas from their Catholic Justice Educator's Network.
- [www.stthomas.edu/cathstudies/cst/educ](http://www.stthomas.edu/cathstudies/cst/educ) -- The University of St. Thomas in St. Paul, MN offers a clearinghouse of resources and models for weaving Catholic social teaching into education programs at all levels.