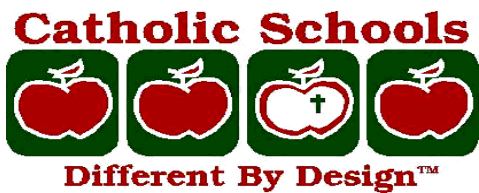


DIOCESE OF TOLEDO

**SCIENCE
COURSE OF STUDY
GRADE TWO**



Catholic Youth and School Services
1933 Spielbusch Avenue, P.O. Box 985
Toledo, Ohio 43697-0985
January 2005

REVIEW PROCESS

Under the direction of the superintendent, the Assistant Superintendent and Curriculum Consultant facilitated the Science Course of Study Revision process. During the spring and fall of 2004, the review committee aligned the Ohio Academic Content Standards, Science, with Catholic Social Teaching. Committee members sought to find the nexus of faith and morals, building a just society, and Science content.

Superintendent

Mr. Jack Altenburger

Assistant Superintendent

Mrs. Carolyn Schmidbauer

Curriculum Consultant

Mrs. Ann Sardeson

Members of the Science Course of Study Committee

Beth Restivo

Blessed Sacrament, Toledo

Karen Mahr

St. Joan of Arc

Sara Fitzgerald

St. Paul Elem., Norwalk

Marty Smith

Central Catholic, Toledo

Thomas Farrell

Lial, Whitehouse

Tammy Hinkle

Little Flower, Toledo

Theresa Martin

Christ the King, Toledo

Craig McRedmond

Calvert H.S., Tiffin

Nancy Henkel

Gesu, Toledo

Lesley King

Gesu, Toledo

Anna Huffstetler

Gesu, Toledo

Kristopher Witker

Christ the King, Toledo

Bonnie-Jean Chudzinski

Our Lady of Lourdes, Toledo

Susan Bastian

Sylvania Franciscan Academy, Sylvania

Tracy Frederick

Central Catholic, Sandusky

Mary Russell

St. Aloysius, Bowling Green

DIOCESE OF TOLEDO PHILOSOPHY

“The duty of human perfection, like the whole universe, has been renewed, recast, supernaturalized, in the Kingdom of God. It is a truly Christian duty to grow... and to make one’s talents bear fruit...It is a part of the essentially Catholic vision to look upon the world as maturing--not only in each individual or in each nation, but in the whole human race.”
(Teilhard de Chardin, The Divine Milieu)

The schools of the Catholic Diocese of Toledo assist parents in preparing their youngsters to assume their Christian vocation. The schools enable youngsters to perfect and grow in the knowledge, skills, values and attitudes to which they are called by Jesus Christ. This vocation begins and grows as each member hears the message of the Gospel, seeks to achieve a personal relationship with Jesus Christ, and shares in a commitment of love and service of God and others in order to transform self and society.

Christian education in the Toledo diocesan schools is intended to make students become people of faith who can experience--inside and outside the school setting--learning and living in the light of this faith commitment. Students are instructed in human knowledge and skills in order to best relate human culture to God’s plan for his evolving creation. Religious education, i.e., instruction in truths and development of values, is of primary concern. This religious education serves as the basis by which students can integrate their experiences of learning and living at each stage of their development.

This integration thrives in a thoroughly Christian atmosphere where faculties and staffs share and demonstrate in their professional and private lives this same commitment to personal perfection and growth in Jesus Christ.

Toledo diocesan schools enable students to extend their personal faith commitment through prayer and by serving others. Together with faculty and staff, students participate in liturgical activities, which foster community. Students explore ways to meet the challenges of tensions and conflicts, which occur in community, especially in peacemaking and the achievement of justice. Gospel values impel students to special concern for all who suffer any disadvantage. Students are enabled to commit themselves to the public interest by developing the skills and talents needed to contribute to the life of the nation.

This experience of integrating learning and living a commitment of faith is a reason for hope. It is the duty of the schools of the diocese of Toledo to continually explore and rekindle hope for the future in the light of the present reality of the universe. Engaging our members--and the community-at-large--in a search for growth and perfection is our never-ending obligation. Our ultimate goal is union with Jesus Christ, “the way, the truth and the life.”

Science Education Philosophy

As Catholic School Educators we believe that...

Science education provides, helps, and shares the understanding of God's creation through exploration and inquiry.

Earth and Space science is the understanding of the composition of the parts of the universe, their interactions and our responsibility as stewards of creation.

Life science is knowledge, understanding and exploration of all living systems, in their physical environment. It includes the creation process, respect for life and the responsibility for human animal and plant life of our earth.

Physical science is a knowledge of the structures, the processes and the interactions that drive our natural world. It includes stewardship of creation and the responsibility to protect God's creation.

Space and Technology is the interdisciplinary connection of our understanding of science and how we make and use tools to progress in scientific knowledge; involving assessment and investigation to communicate knowledge and exploration. It should include the understanding of the benefits, risks, costs, and responsibility of using technology.

Scientific Inquiry is the ability to ask valid questions; gather and analyze information; develop and understand a hypothesis; make projections; develop a plan of action; and evaluate a variety of conclusions. It should include the teaching that life has dignity and in the process of study there is responsibility and respect.

Scientific knowledge is the ability to understand the relationship and interaction between living and non-living components. It is based on evidence, prediction and logic, and is subject to modification, and not subject to the natural world. It includes the understanding that God is the author of all life and there will be growth and advances as new evidence is discovered.

Excerpts from the Catechism of the Catholic Church

295 We believe that God created the world according to his wisdom.¹⁴¹ It is not the product of any necessity whatever, nor of blind fate or chance. We believe that it proceeds from God's free will; he wanted to make his creatures share in his being, wisdom and goodness: "For you created all things, and by your will they existed and were created."¹⁴² Therefore the Psalmist exclaims: "O LORD, how manifold are your works! In wisdom you have made them all"; and "The LORD is good to all, and his compassion is over all that he has made."¹⁴³

302 Creation has its own goodness and proper perfection, but it did not spring forth complete from the hands of the Creator. The universe was created "in a state of journeying" (*in statu viae*) toward an ultimate perfection yet to be attained, to which God has destined it. We call "divine providence" the dispositions by which God guides his creation toward this perfection:

By his providence God protects and governs all things which he has made, "reaching mightily from one end of the earth to the other, and ordering all things well". For "all are open and laid bare to his eyes", even those things which are yet to come into existence through the free action of creatures.¹⁶¹

306 God is the sovereign master of his plan. But to carry it out he also makes use of his creatures; co-operation. This use is not a sign of weakness, but rather a token of almighty God's greatness and goodness. For God grants his creatures not only their existence, but also the dignity of acting on their own, of being causes and principles for each other, and thus of co-operating in the accomplishment of his plan.

307 To human beings God even gives the power of freely sharing in his providence by entrusting them with the responsibility of "subduing" the earth and having dominion over it.¹⁶⁸ God thus enables men to be intelligent and free causes in order to complete the work of creation, to perfect its harmony for their own good and that of their neighbors. Though often unconscious collaborators with God's will, they can also enter deliberately into the divine plan by their actions, their prayers and their sufferings.¹⁶⁹ They then fully become "God's fellow workers" and co-workers for his kingdom.¹⁷⁰

308 The truth that God is at work in all the actions of his creatures is inseparable from faith in God the Creator. God is the first cause who operates in and through secondary causes: "For God is at work in you, both to will and to work for his good pleasure."¹⁷¹

Creation Accounts in Genesis

The first story of Genesis describes the creation of the universe, a world that is all good. The writers of this story present an explanation of the universe that is based neither on historical events nor on facts of natural science. Instead, the writers present religious truths, because their focus is God, not cultures and peoples, and not nature or science. God creates the first man and woman in his image as human beings with dignity and free will.

For the Genesis writers, the religious truths presented are more important than the literal, scientific accuracy of the details of the stories: God created the world and all that is in it; how he made it is not their focus.

Creationism

Creationism is the teaching of the origins of the world through a literal interpretation of the creation stories in Genesis. This means that God created the world literally in six days and rested on the seventh.

However, to a non-creationist, the important truth in the Creation accounts is religious truth: God made the world and all that is in it. It is more important to a "non-creationist" to know THAT God created the world, rather than to know literally HOW he created it. "Non-creationists" know that in the story of creation, the writers presented religious truth, but the details of the creation stories are not to be interpreted literally. In reading them, one must consider the culture, literary forms, and the author's purpose in telling or writing the story.

Evolution Theory

The evolution theory seeks to explain the origins of the world and of humans through science. Evolution teaches that humans and other forms of life have evolved from lower forms.

Natural science has enriched our knowledge of the development of life on earth, the appearance of humans, and the structure of the world.

However, today's scientific knowledge was unknown and unimportant to the writers of the Creation accounts in the Bible.

Catholics and the Evolution Theory

If Catholics choose to accept the theory of evolution, they must also believe that God began the entire process of creation. If human life has taken its form from a pre-existent living form, as evolution teaches, Catholics believe that the spiritual soul has been created immediately by God and did not evolve.

With all of the developments in science, however, the truths underlying the stories in Genesis are still valid today:

God created human life and infused a human soul.

Life is to be lived in right relationship to Himself and in right relationship to other people and nature.

God chose to have a special people and made a covenant with them.

These eternal truths are central to the faith community and tell us a great deal about God, about human nature, and about the relationship between God and humans.

Excerpts from
SHARING CATHOLIC SOCIAL TEACHING
Challenges and Directions
REFLECTIONS OF THE U.S. CATHOLIC BISHOPS

The church's social teaching is a rich treasure of wisdom about building a just society and living lives of holiness amidst the challenges of modern society. Modern Catholic social teaching has been articulated through a tradition of papal, conciliar, and episcopal documents. The depth and richness of this tradition can be understood best through a direct reading of these documents. In these brief reflections, we wish to highlight several of the key themes that are at the heart of our Catholic social tradition.

LIFE AND DIGNITY OF THE HUMAN PERSON

The Catholic Church proclaims that human life is sacred and that the dignity of the human person is the foundation of a moral vision for society. Our belief in the sanctity of human life and the inherent dignity of the human person is the foundation of all the principles of our social teaching. In our society, human life is under direct attack from abortion and assisted suicide. The value of human life is being threatened by increasing use of the death penalty. We believe that every person is precious, that people are more important than things, and that the measure of every institution is whether it threatens or enhances the life and dignity of the human person.

CALL TO FAMILY, COMMUNITY, AND PARTICIPATION

The person is not only sacred but also social. How we organize our society—in economics and politics, in law and policy—directly affects human dignity and the capacity of individuals to grow in community. The family is the central social institution that must be supported and strengthened, not undermined. We believe people have a right and a duty to participate in society, seeking together the common good and well-being of all, especially the poor and vulnerable.

RIGHTS AND RESPONSIBILITIES

The Catholic tradition teaches that human dignity can be protected and healthy community can be achieved only if human rights are protected and responsibilities are met. Therefore, every person has a fundamental right to life and a right to those things required for human decency. Corresponding to these rights are duties and responsibilities to one another, to our families, and to the larger society.

OPTION FOR THE POOR AND VULNERABLE

A basic moral test is how our most vulnerable members are faring. In a society marred by deepening divisions between rich and poor, our tradition recalls the story of the Last Judgment (Mt 25:31-46) and instructs us to put the needs of the poor and vulnerable first.

THE DIGNITY OF WORK AND THE RIGHTS OF WORKERS

The economy must serve people, not the other way around. Work is more than a way to make a living; it is a form of continuing participation in God's creation. If the dignity of work is to be protected, then the basic rights of workers must be respected—the right to productive work, to decent and fair wages, to organize and join unions to private property, and to economic initiative.

SOLIDARITY

We are our brothers' and sisters' keepers, wherever they live. We are one human family, whatever our national, racial, ethnic, economic, and ideological differences. Learning to practice the virtue of solidarity means learning that "loving our neighbor" has global dimensions in an interdependent world.

CARE FOR GOD'S CREATION

We show our respect for the Creator by our stewardship of creation. Care for the earth is not just an Earth Day slogan, it is a requirement of our faith. We are called to protect people and the planet, living our faith in relationship with all of God's creation. This environmental challenge has fundamental moral and ethical dimensions that cannot be ignored.

This summary should only be a starting point for those interested in Catholic social teaching. A full understanding can only be achieved by reading the papal, conciliar, and episcopal documents that make up this rich tradition.

Grades K-2

Life Sciences

Students demonstrate an understanding of how living systems function and how they interact with the physical environment. This includes an understanding of the cycling of matter and flow of energy in living systems. An understanding of the characteristics, structure and function of cells, organisms and living systems will be developed. Students will also develop a deeper understanding of the principles of heredity, biological evolution, and the diversity and interdependence of life. Students demonstrate an understanding of different historical perspectives, scientific approaches and emerging scientific issues associated with the life sciences.

Benchmark A: Discover that there are living things, non-living things and pretend things, and describe the basic needs of living things (organisms)

Kindergarten

- Characteristics and Structure of Life*
1. Explore differences between living and non-living things (e.g., plant-rock).
 2. Discover that stories (e.g., cartoons, movies, comics) sometimes give plants and animals characteristics they really do not have (e.g., talking flowers).

Grade One

- Characteristics and Structure of Life*
1. Explore that organisms, including people, have basic needs which include air, water, food, living space and shelter.
- Diversity and Interdependence of Life*
4. Investigate that animals eat plants and/or other animals for food and may also use plants or other animals for shelter and nesting.

Grade Two

- Characteristics and Structure of Life*
1. Explain that animals, including people, need air, water, food, living space and shelter; plants need air, water, nutrients (e.g., minerals), living space and light to survive.
- Diversity and Interdependence of Life*
5. Explain that food is a basic need of plants and animals (e.g., plants need sunlight to make food and to grow, animals eat plants and/or other animals for food, food chain) and is important because it is a source of energy (e.g., energy used to play, ride bicycles, read, etc.).

Benchmark B: Explain how organisms function and interact with their physical environment.

Kindergarten

*Diversity and
Interdependence of Life*

5. Investigate observable features of plants and animals that help them live in different kinds of places.
6. Investigate the habitats of many different kinds of local plants and animals and some of the ways in which animals depend on plants and each other in our community.

Grade One

*Characteristics and
Structure of Life*

2. Explain that food comes from sources other than grocery stores (e.g., farm crops, farm animals, oceans, lakes and forests).
3. Explore that humans and other animals have body parts that help to seek, find and take in food when they are hungry (e.g., sharp teeth, flat teeth, good nose and sharp vision).
5. Recognize that seasonal changes can influence the health, survival or activities of organisms.

Grade Two

*Characteristics and
Structure of Life*

2. Identify that there are many distinct environments that support different kinds of organisms.
3. Explain why organisms can survive only in environments that meet their needs (e.g., organisms that once lived on Earth have disappeared for different reasons such as natural forces or human-caused effects).
6. Investigate the different structures of plants and animals that help them live in different environments (e.g., lungs, gills, leaves and roots).
7. Compare the habitats of many different kinds of Ohio plants and animals and some of the ways animals depend on plants and each other.
8. Compare the activities of Ohio's common animals (e.g., squirrels, chipmunks, deer, butterflies, bees, ants, bats and frogs) during the different seasons by describing changes in their behaviors and body covering.
9. Compare Ohio plants during the different seasons by describing changes in their appearance.

Benchmark C: Describe similarities and differences that exist among individuals of the same kind of plants and animals.

Kindergarten

- Heredity*
3. Describe how plants and animals usually resemble their parents.
 4. Investigate variations that exist among individuals of the same kind of plant or animal.

Grade One

No indicators present for this benchmark.

Grade Two

- Heredity*
4. Compare similarities and differences among individuals of the same kind of plants and animals, including people.

Grades K-2

Physical Sciences

Students demonstrate an understanding of the composition of physical systems and the concepts and principles that describe and predict physical interactions and events in the natural world. This includes demonstrating an understanding of the structure and properties of matter, the properties of materials and objects, chemical reactions and the conservation of matter. In addition, it includes understanding the nature, transfer and conservation of energy; motion and the forces affecting motion; and the nature of waves and interactions of matter and energy. Students demonstrate an understanding of the historical perspectives, scientific approaches and emerging scientific issues associated with the physical sciences.

Benchmark A: Discover that many objects are made of parts that have different characteristics. Describe these characteristics and recognize ways an object may change.

Kindergarten

Nature of Matter

1. Demonstrate that objects are made of parts (e.g., toys, chairs).
2. Examine and describe objects according to the materials that make up the object (e.g., wood, metal, plastic and cloth).
3. Describe and sort objects by one or more properties (e.g., size, color and shape).

Grade One

Nature of Matter

1. Classify objects according to the materials they are made of and their physical properties.
2. Investigate that water can change from liquid to solid or solid to liquid.
3. Explore and observe that things can be done to materials to change their properties (e.g., heating, freezing, mixing, cutting, wetting, dissolving, bending and exposing to light).
4. Explore changes that greatly change the properties of an object (e.g., burning paper) and changes that leave the properties largely unchanged (e.g., tearing paper).

Grade Two

No indicators present for this benchmark.

Benchmark B: Recognize that light, sound and objects move in different ways.

Kindergarten

- Forces and Motion*
4. Explore that things can be made to move in many different ways such as straight, zigzag, up and down, round and round, back and forth, or fast and slow.
 5. Investigate ways to change how something is moving (e.g., push, pull).

Grade One

- Forces and Motion*
5. Explore the effects some objects have on others even when the two objects might not touch (e.g., magnets).
 6. Investigate a variety of ways to make things move and what causes them to change speed, direction and/or stop.

Grade Two

- Forces and Motion*
1. Explore how things make sound (e.g., rubber bands, tuning fork and strings).
 3. Explore with flashlights and shadows that light travels in a straight line until it strikes an object.

Benchmark C: Recognize sources of energy and their uses.

Kindergarten

No indicators present for this benchmark.

Grade One

- Nature of Energy*
7. Explore how energy makes things work (e.g., batteries in a toy and electricity turning fan blades).
 8. Recognize that the sun is an energy source that warms the land, air and water.
 9. Describe that energy can be obtained from many sources in many ways (e.g., food, gasoline, electricity or batteries).

Grade Two

- Forces and Motion*
2. Explore and describe sounds (e.g., high, low, soft and loud) produced by vibrating objects.

Grades K-2

Science and Technology

Students recognize that science and technology are interconnected and that using technology involves assessment of the benefits, risks and costs. Students should build scientific and technological knowledge, as well as the skill required to design and construct devices. In addition, they should develop the processes to solve problems and understand that problems may be solved in several ways.

Benchmark A: Explain why people, when building or making something, need to determine what it will be made of, how it will affect other people and the environment.

Kindergarten

Understanding Technology

1. Explore that objects can be sorted as “natural” or “man-made”.
2. Explore that some materials can be used over and over again (e.g., plastic or glass containers, cardboard boxes and tubes).

Grade One

Understanding Technology

1. Explore that some kinds of materials are better suited than others for making something new (e.g., the building materials used in the *Three Little Pigs*).
3. Identify some materials that can be saved for community recycling projects (e.g., newspapers, glass and aluminum).
4. Explore ways people use energy to cook their food and warm their homes (e.g., wood, coal, natural gas and electricity).
5. Identify how people can save energy by turning things off when they are not using them (e.g., lights and motors).

Grade Two

Understanding Technology

1. Explain that developing and using technology involves benefits and risks.
2. Investigate why people make new products or invent new ways to meet their individual wants and needs.
3. Predict how building or trying something new might affect other people and the environment.

Benchmark B: Explain that to construct something requires planning, communication, problem solving and tools.

Kindergarten

*Abilities To Do
Technological Design*

3. Explore that each kind of tool has an intended use, which can be helpful or harmful (e.g., scissors can be used to cut paper but they can also hurt you).

Grade One

*Understanding
Technology*

2. Explain that when trying to build something or get something to work better, it helps to follow directions and ask someone who has done it before.

*Abilities To Do
Technological Design*

6. Investigate that tools are used to help make things and some things cannot be made without tools.
7. Explore that several steps are usually needed to make things (e.g., building with blocks).
8. Investigate that when parts are put together they can do things that they could not do by themselves (e.g., blocks, gears and wheels).

Grade Two

*Abilities To Do
Technological Design*

4. Communicate orally, pictorially, or in written form the design process used to make something.

Grades K-2

Scientific Inquiry

Students develop scientific habits of mind as they use the processes of scientific inquiry to ask valid questions and to gather and analyze information. They understand how to develop hypotheses and make predictions. They are able to reflect on scientific practices as they develop plans of action to create and evaluate a variety of conclusions. Students are also able to demonstrate the ability to communicate their findings to others.

Benchmark A: Ask a testable question.

Kindergarten

Doing Scientific Inquiry

1. Ask “what if” questions.
2. Explore and pursue student-generated “what if” questions.

Grade One

Doing Scientific Inquiry

1. Ask “what happens when” questions.
2. Explore and pursue student-generated “what happens when” questions.

Grade Two

Doing Scientific Inquiry

1. Ask “how can I/we” questions.
2. Ask “how do you know” questions (not “why” questions) in appropriate situations and attempt to give reasonable answers when others ask questions.
3. Explore and pursue student-generated “how” questions.

Benchmark B: Design and conduct a simple investigation to explore a question.

Kindergarten

Doing Scientific Inquiry

3. Use appropriate safety procedures when completing scientific investigations.
4. Use the five senses to make observations about the natural world.
7. Use appropriate tools and simple equipment/instruments to safely gather scientific data (e.g., magnifiers and other appropriate tools).
10. Make new observations when people give different descriptions for the same thing.

Grade One

Doing Scientific Inquiry

3. Use appropriate safety procedures when completing scientific investigations.
6. Use appropriate tools and simple equipment/instruments to safely gather scientific data (e.g., magnifiers, timers and simple balances and other appropriate tools).

Grade Two

Doing Scientific Inquiry

4. Use appropriate safety procedures when completing scientific investigations.
7. Use appropriate tools and simple equipment/instruments to safely gather scientific data (e.g., magnifiers, non-breakable thermometers, timers, rulers, balances and calculators and other appropriate tools).
8. Measure properties of objects using tools such as rulers, balances and thermometers.

Benchmark C: Gather and communicate information from careful observations and simple investigation through a variety of methods.

Kindergarten

Doing Scientific Inquiry

5. Draw pictures that correctly portray features of the item being described.
6. Recognize that numbers can be used to count a collection of things.
8. Measure the lengths of objects using non-standard methods of measurement (e.g., teddy bear counters and pennies).
9. Make pictographs and use them to describe observations and draw conclusions.

Grade One

Doing Scientific Inquiry

4. Work in a small group to complete an investigation and then share findings with others.
5. Create individual conclusions about group findings.
7. Make estimates to compare familiar lengths, weights and time intervals.
8. Use oral, written and pictorial representation to communicate work.
9. Describe things as accurately as possible and compare with the observations of others.

Grade Two

Doing Scientific Inquiry

5. Use evidence to develop explanations of scientific investigations. (What do you think? How do you know?)
6. Recognize that explanations are generated in response to observations, events and phenomena.
9. Use whole numbers to order, count, identify, measure and describe things and experiences.
10. Share explanations with others to provide opportunities to ask questions, examine evidence and suggest alternative explanations.

Grades K-2

Scientific Ways of Knowing

Students realize that the current body of scientific knowledge must be based on evidence, be predictive, logical, subject to modification and limited to the natural world. This includes demonstrating an understanding that scientific knowledge grows and advances as new evidence is discovered to support or modify existing theories, as well as to encourage the development of new theories. Students are able to reflect on ethical scientific practices and demonstrate an understanding of how the current body of scientific knowledge reflects the historical and cultural contributions of women and men who provide us with a more reliable and comprehensive understanding of the natural world.

Benchmark A: Recognize that there are different ways to carry out scientific investigations. Realize that investigations can be repeated under the same conditions with similar results and may have different explanations.

Kindergarten

Nature of Science

1. Recognize that scientific investigations involve asking open-ended questions. (How? What if?)
2. Recognize that people are more likely to accept your ideas if you can give good reasons for them.

Grade One

Nature of Science

1. Discover that when a science investigation is done the same way multiple times, one can expect to get very similar results each time it is performed
2. Demonstrate good explanations based on evidence from investigations and observations.

Grade Two

Nature of Science

1. Describe that scientific investigations generally work the same way under the same conditions.

Benchmark B: Recognize the importance of respect for all living things.

Kindergarten

- Ethical Practices* 3. Interact with living things and the environment in ways that promote respect.

Grade One

No indicators present for this benchmark.

Grade Two

- Ethical Practices* 3. Describe ways in which using the solution to a problem might affect other people and the environment.

Benchmark C: Recognize that diverse groups of people contribute to our understanding of the natural world.

Kindergarten

- Science and Society* 4. Demonstrate ways science is practiced by people everyday (children and adults).

Grade One

- Science and Society* 3. Explain that everybody can do science, invent things and have scientific ideas no matter where they live.

Grade Two

- Nature of Science* 2. Explain why scientists review and ask questions about the results of other scientists' work.
- Science and Society* 4. Demonstrate that in science it is helpful to work with a team and share findings with others.

Grade Two

1.0 Earth and Space Sciences

<p><i>Caring for God's Creation</i></p>	<p>1.1 Know that our loving God created the universe.</p> <p>1.2 Recognize that the gift of knowledge comes from God.</p> <p>1.3 Recognize that there are more stars in the sky than anyone can easily count.</p> <p>1.4 Observe and describe the effect on the sun, moon and stars as the earth slowly rotates.</p>
<p><i>Earth Systems</i></p>	<p>1.5 Observe and describe the phases of the moon (how the moon appears a little different every day but looks nearly the same again about every four weeks).</p> <p>1.6 Observe and describe daily and seasonal weather patterns.</p> <p>1.7 Use appropriate tools to describe weather by measurable quantities such as temperature and precipitation.</p>

2.0 Life Sciences

<p><i>Care for God's Creation</i></p>	<p>2.1 Know and respect life as a gift from God.</p> <p>2.2 Realize how that as children of God we respect ourselves and God's creation.</p> <p>2.3 Explain that animals, including people, need air, water, nutrients (e.g., minerals), living space and light to survive.</p> <p>2.4 Identify that there are many distinct environments that support different kinds of organisms.</p>
<p><i>Heredity</i></p> <p><i>Diversity and Interdependence of Life</i></p>	<p>2.5 Identify how different biomes affect life and evolution (e.g., deserts, rainforests).</p> <p>2.6 Explain why organisms can survive only in environments that meet their needs (e.g., organisms that once lived on Earth have disappeared for different reasons such as natural forces or human-caused effects).</p> <p>2.7 Identify similarities and differences among individuals of the same kind of plants and animals, including people.</p> <p>2.8 Explain that food is a basic need of plants and animals (e.g., plants need sunlight to make food and to grow, animals eat plants and/ or other</p>

	<p>animals for food, food chain) and that food is important because it is a source of energy (e.g., energy used to play, ride bicycles, read, etc.).</p> <p>2.9 Investigate the different structures of plants and animals that help them live in different environments (e.g., lungs, gills, leaves and roots).</p> <p>2.10 Compare the habitats of many different kinds of Ohio plants and animals and some of the ways animals depend on plants and on each other.</p> <p>2.11 Compare the activities of Ohio’s common animals (e.g., squirrels, chipmunks, deer, butterflies, bees, ants, bats, and frogs) during the different seasons by describing changes in their behaviors and body covering.</p> <p>2.12 Compare Ohio plants during the different seasons by describing changes in their appearance.</p>
--	---

3.0 Physical Sciences

<i>Forces and Motion</i>	<p>3.1 Explore why things make sound through vibrations (e.g., rubber bands, tuning fork and strings).</p> <p>3.2 Explore and describe sounds (e.g., high, low, soft and loud) produced by vibrating objects.</p> <p>3.3 Explore with flashlights and shadows that light travels in a straight line until it strikes an object.</p>
--------------------------	--

4.0 Science and Technology

<i>Understanding Technology</i>	<p>4.1 Know and demonstrate that we are called to use our gifts and talents for the good of others.</p> <p>4.2 Explain that developing and using technology involves benefits and risks.</p> <p>4.3 Investigate why people make new products or invent new ways to meet their individual wants and needs.</p>
<i>Abilities To Do Technological Design</i>	<p>4.4 Predict how building or trying something new might affect other people and the environment.</p> <p>4.5 Communicate orally, pictorially, and in written form the design process used to make something.</p>

5.0 Scientific Inquiry

<p><i>Doing Scientific Inquiry</i></p>	<p>5.1 Recognize the presence of God in nature.</p> <p>5.2 Use scientific method to approach reports and projects.</p> <p>5.3 Ask “how do you know” questions (not “why” questions) in appropriate situations and attempt to give reasonable answers when others ask questions.</p> <p>5.4 Explore and pursue student-generated “how” questions.</p>
<p><i>Care for God’s Creation</i></p>	<p>5.5 Use appropriate safety procedures when completing scientific investigations.</p> <p>5.6 Ask “how can I/we” questions.</p> <p>5.7 Use evidence to develop explanations of scientific investigations. (What do you think? How do you know?)</p> <p>5.8 Recognize that explanations are generated in response to observations, events, and phenomena.</p> <p>5.9 Use appropriate tools and simple equipment/instruments to safely gather scientific data (e.g., magnifiers, non-breakable thermometers, timers, rulers, balances and calculators and other appropriate tools).</p> <p>5.10 Experiment, collect and analyze data or findings.</p> <p>5.11 Measure properties of objects using tools such as rulers, balances and thermometers, using metric system.</p> <p>5.12 Use whole numbers to order, count, identify, measure and describe things and experiences.</p> <p>5.13 Share explanations with others to provide opportunities to ask questions, examine evidence and suggest alternative explanations.</p> <p>5.14 Appropriately use verbs: Discover, Explore, Investigate, Identify, Explain, Describe, Relate, Summarize, Predict, Compare, Analyze, Recognize, Ask, Trace, Demonstrate.</p>

6.0 Scientific Ways of Knowing

<p><i>Nature of Science</i></p>	<p>6.1 Understand that we respect others as children of God.</p> <p>6.2 Understand that physical evidence is established through experimentation.</p>
<p><i>Life and Dignity of Human Person</i></p>	<p>6.3 Describe that scientific investigations generally work the same way under the same conditions.</p>

<i>Ethical Practices</i>	6.4 Explain why scientists review and ask questions about the result of other scientists' work.
<i>Science and Society</i>	6.5 Describe ways in which using the solution to a problem might affect other people and the environment. 6.6 Demonstrate that in science it is helpful to work with a team and share findings with others. 6.7 Experience group experiments and group projects.

PERFORMANCE VERBS

analyze	To study the different parts of a problem or situation in order to understand the “big picture”.
apply	To put into action.
ask	To make inquiry; seek information.
choose	To select from a number of possible alternatives; decide on and pick out.
cite	To mention or bring forward as support, illustration, or proof.
classify	To arrange or organize according to class or category.
communicate	To convey information about; make known; impart.
compare	To examine similarities and differences.
comprehend	To take in the meaning, nature, or importance of; grasp.
conclude	To arrive at (a logical conclusion or end) by the process of reasoning; infer on the basis of convincing evidence.
construct	To form by assembling or combining parts; build.
decide	To settle conclusively all contention or uncertainty about.
define	To describe the nature or basic qualities of; explain.
demonstrate	To present by experiments, examples, or practical application; explain and illustrate.
derive	To arrive at by reasoning; deduce or infer.
describe	Tell about something in detail.
design	To formulate a plan for.
develop	To cause to become more complex or intricate; add detail and fullness to.
differentiate	To constitute the distinction between.
discover	To notice or learn, especially by making an effort.
discuss	To speak with another or others about; talk over.

draw	To bring to a certain condition or action; lead.
evaluate	To use criteria to judge the role or value of something for a given purpose, such as explaining the pros, cons, or consequences of a decision or an action.
examine	To observe carefully or critically; inspect.
explain	To offer reasons for or a cause of; justify.
explore	To investigate systematically; examine appropriately.
formulate	To express an idea based on examination of information, trends, or patterns, such as devising a category to classify events.
give	To furnish or contribute.
identify	To ascertain the origin, nature, or definitive characteristics of.
illustrate	To clarify, as by use of examples or comparisons.
infer	To go beyond what is stated; draw conclusions based on given information.
interpret	To explain the meaning of.
interact	To act on each other.
justify	To demonstrate or prove to be just, right, or valid.
make	To institute or establish; enact.
measure	An evaluation or a basis of comparison.
name	A word or words by which an entity is designated and distinguished from others.
observe	To watch attentively.
predict	To use knowledge to make a statement about what is to come.
present	To introduce, especially with formal ceremony.
recognize	To know or identify from past experience or knowledge.
record	To set down for preservation in writing or other permanent form.
relate	To establish or demonstrate a connection between.

research	Scholarly or scientific investigation or inquiry.
revise	To prepare a newly edited version of.
select	To take as a choice from among several; pick out.
share	To participate in, use, enjoy, or experience jointly or in turns.
show	To direct one's attention to; point out.
summarize	To condense information such as stating the main points of an argument or the main events in a story.
support	To provide evidence to back a conclusion or argument.
trace	To describe a path or sequence, such as the order of events in a story.
use	To put into service or apply for a purpose.

GLOSSARY

A

abiotic	Non-living.
acceleration	The rate of change of velocity with respect to time.
acid	A substance that dissolves in water with the formation of hydrogen ions and reacts with a base to form a salt and water. It neutralizes alkalis, dissolves some metals, and turns litmus red; typically, a corrosive and sour-tasting liquid.
adaptation	Adjustment to environmental conditions, modification of an organism or its parts that makes it more fit for existence under the conditions of its environment.
alleles	Any of the alternative forms of a gene that may occur at a given locus on a chromosome.
anemometer	An instrument for measuring and indicating the force or speed of the wind.
asexual reproduction	Involving or reproducing by reproductive processes (as cell division, spore formation, fission or budding) that do not involve the union of germ cells or egg and sperm.
asteroid	A small rocky body orbiting the sun.
atmosphere	The gaseous envelope surrounding the earth; consists of oxygen, nitrogen and other gases, extends to a height of about 40,744 km (22,000 miles), and rotates with Earth.
atmospheric pressure	The pressure exerted by the atmosphere at the surface of the Earth due to the weight of the air.
atom	The smallest particle of an element that can exist either alone or in combination.
atomic number	the number of protons in the nucleus of an atom.

B

bacteria	Unicellular, prokaryotic microorganisms that lack chlorophyll, multiply by fission, and can be seen only with a microscope; they occur in three main forms: spherical, rod-shaped and spiral. Some bacteria cause diseases such as pneumonia, tuberculosis and anthrax, and others are necessary for fermentation and nitrogen fixation.
balance	An instrument for measuring mass.
barometer	An instrument for determining the pressure of the atmosphere.
base	A substance that dissolves in water with the formation of hydroxyl ions and reacts with an acid to form a salt and water; turns litmus paper blue.
biogeochemical cycles	Relating to the partitioning and cycling of chemical elements and compounds between the living and nonliving parts of an ecosystem.
biological evolution	Changes in the genetic composition of a population through successive generations
biomass	The amount of living matter.
biome	Major ecological community (tropical rain forest, grassland or desert).
biotechnology	Biological science when applied especially in genetic engineering and recombinant DNA technology.
biotic	Relating to life.
body covering	Feature that covers the body, such as fur or feathers.
body system	A system of the body (i.e. digestive system, circulatory system).
boiling point	The temperature at which a liquid boils.

C

capacity	The maximum amount or number that can be contained or accommodated.
-----------------	---

carnivore	A flesh-eating animal.
cell	The smallest structural and functional unit of an organism.
cell division	The formation of two daughter cells from one parent cell, mitosis.
cell membrane	The bounding membrane of cells which controls the entry of molecules and the interaction of cells with their environment, plasma membrane.
cell respiration	Metabolic processes which break down nutrients into usable energy.
cell wall	A structure external to the plasma membrane of a plant cell. It provides structure and support.
characteristic	A distinguishing trait, feature, quality or property.
chemical change	A change in a substance resulting in an entirely different substance with different properties from the first.
chemical property	Chemical characteristics of a substance that distinguish it from other substances.
chemical reaction	A process that involves rearrangement of the molecular or ionic structure of a substance, as opposed to a change in physical form or a nuclear reaction.
chemosynthesis	Synthesis of organic compounds (as in living cells) by energy derived from chemical reactions.
chloroplast	A plastid that contains chlorophyll and is the site of photosynthesis.
chromosome	A threadlike structure of nucleic acids and protein found in the nucleus of most living cells, carrying genetic information in the form of genes.
chrysalis	The pupa of a butterfly and some insects.
cilia	Fine hair-like protrusions of the cell surface, which beat in unison to create currents of liquid over cell surface of propel the cell through the medium.

circuit	The complete path of an electric current usually including the source of electric energy.
circular motion	Motion of an object that follows the circumference of a circle.
classification	Systematic arrangement in groups or categories according to established criteria.
climate	The average course or condition of the weather at a place usually over a period of years as exhibited by temperature, wind velocity and precipitation.
comet	A celestial body that consists of a fuzzy head usually surrounding a bright nucleus, that has a usually highly eccentric orbit, and that often, when in the part of its orbit near the sun, develops a long tail which points away from the sun.
community	Interacting populations that live in a defined habitat.
composition	The qualitative and quantitative makeup of a chemical compound.
condensation	The conversion of a substance (such as water) from the vapor state to denser liquid or solid state usually initiated by a reduction in the temperature of the vapor.
conservation	A careful preservation and protection of something; especially planned management of a natural resource to prevent exploitation, destruction or neglect.
consumer	An organism requiring complex organic compounds for food, which it obtains by preying on other organisms or by eating particles or organic matter.
control	A group used as a standard or comparison for checking the results of an experiment.
covalent	chemical bonds formed by the sharing of electrons between atoms.
convection	The circulatory motion that occurs in a fluid at a non-uniform temperature owing to the variation of its density and the action of gravity.
convergent	To come together or tend to come together at a point.

core	The central part of a celestial body (as Earth or sun) usually having different physical properties from the surrounding parts.
crust	The outer part of a planet, moon or asteroid composed essentially of crystalline rocks.
crustal deformation	A change in the crust of a planet, moon or asteroid.
crystal	A piece of homogeneous solid substance having a natural, geometrically regular form with symmetrically arranged plane faces.
current	Continuous flow as of air, water or electric charge.
cycle	An interval of time during which a sequence of a recurring succession of events isotope is formed.
D	
decay rate	The rate at which a radioactive isotope disintegrates until a final non-radioactive isotope is formed.
decomposers	Organisms such as bacteria and fungi that feed and breakdown dead organisms returning constituents of organic substances to the environment.
dependent variable	A variable whose values are determined by one or more (independent) variables.
design	To create, fashion, execute or construct according to plan.
differentiation	The sum of the processes whereby apparently indifferent cells, tissues and structures attain their adult form and function.
diversity	A great deal of variety.
DNA	Deoxyribonucleic acid, a double strand of nucleotides, that is a self-replicating material present in living organisms as the main constituent of chromosomes. It contains the genetic code and transmits the heredity pattern.
dominant	A gene, that when present, is expressed in the phenotype.

E

eclipse	The total or partial obscuring of one celestial body by another.
ecological	The interactions and relationships between organisms and their environment.
ecosystem	The complex of a community of organisms and its environment functioning as an ecological unit.
egg	Female gamete; ovum.
electric field	A region associated with a distribution of electric charge or a varying magnetic field, in which forces due to that charge or field, act upon other electric charges.
electric force	A force that exists between two charged objects.
electricity	A form of energy resulting from the existence of charged particles, either statically as an accumulation of charge or dynamically as a current.
electromagnetic radiation	A kind of radiation including visible light, radio waves, gamma rays and x-rays in which electric and magnetic fields vary simultaneously.
electromagnetic spectrum	The entire range of wavelengths or frequencies of electromagnetic radiation extending from gamma rays to the longest radio waves and including visible light.
electron	A stable subatomic particle with negative electrical charge, found in all atoms and acting as the primary carrier of electricity in solids.
element	Any of more than 100 fundamental substances that consist of atoms of only one kind and that singly or in combination constitute all matter.
emigration	A category of population dispersal covering one-way movement out of the population area.
endothermic	Characterized by or formed with absorption of heat.
energy	The capacity for doing work, can be in various forms such as nuclear, sound, thermal and light.

entropy	A thermodynamic quantity representing the availability of a system's thermal energy for conversion into mechanical work, often interpreted as the degree of disorder or randomness in the system.
environment	The complex of physical, chemical and biotic factors that act upon an organism or an ecological community and ultimately determine its form and survival.
epicenter	The part of the Earth's surface directly above the focus of an earthquake.
equilibrium	A state in which opposing forces or influences are balanced.
eukaryotic	An organism composed of one or more cells containing visibly evident nuclei and organelles.
evaporation	To convert into vapor.
evidence	Facts of observations on which a conclusion can be based.
evolution (biological)	Changes in the genetic composition of a population through successive generations.
exothermic	Characterized by or formed with liberation of heat.
extinct	A species of organisms that no longer exists.
F	
faulting	To fracture so as to produce a geologic fault.
fermentation	An enzymatically controlled anaerobic breakdown of an energy-rich compound.
fission	The splitting of an atomic nucleus resulting in the release of large amounts of energy.
flagella	Long hair-like extensions from the cell surface whose movement is used for locomotion.
focus	The place of origin of an earthquake or moonquake (as related to earthquakes).

food chain	An arrangement of the organisms of an ecological community according to the order of predation in which each uses the next usually lower member as a food source.
food web	The totality of interacting food chains in an ecological community; interacting food chains in an ecological community.
force	An influence, that if applied to a free body, results chiefly in an acceleration of that body in the direction of its application.
fossil	Remnant, impression or trace of an organism of past geologic ages that has been preserved in the Earth's crust.
fossil fuel	A fuel (such as coal, oil or natural gas) that is formed in Earth from plant or animal remains.
frame of reference	an arbitrary set of axes with reference to which the position or motion of something is described or physical laws are formulated.
friction	The force that resists relative motion between two bodies in contact.
fungi	Any of a major group of saprophytic and parasitic spore-producing organisms including molds, rusts, mildews, smuts, mushrooms and yeasts.
fusion	The union of atomic nuclei to form heavier nuclei resulting in the release of enormous quantities of energy.
G	
galaxy	Any of the very large groups of stars and associated matter that are found throughout the universe.
gas	A fluid (such as air) that has neither independent shape nor volume but tends to expand indefinitely.
gene	A functional hereditary unit located at a particular point on a chromosome that controls or acts in the transmission of hereditary characteristics.
genetic drift	The process by which gene frequencies are changed.

germenation	The beginning of growth in a spore, seed, zygote etc., especially following a dormant period.
glaciation	To subject to glacial action in which a large body of ice moves slowly down a slope or valley, or spreads outward on a land surface.
gravitation	A force manifested by acceleration toward each other of two free material particles or bodies, or of radiant-energy quanta.
gravity	The gravitational attraction of the mass of the Earth, the moon or a planet for bodies at or near its surface.
H	
habitability	Suitable for a dwelling place.
habitat	The place or environment where a plant or animal naturally or normally lives and grows.
herbivore	A plant-eating animal.
heredity	The sum of the qualities and potentialities genetically derived from one's ancestors; the relation between successive generations, by which characteristics persist.
homeostasis	A state of equilibrium between different but interrelated functions or elements, as in an organism or group.
humidity	The amount of moisture in the atmosphere.
hydrosphere	The aqueous envelope of the Earth including bodies of water and aqueous vapor in the atmosphere.
hypothesis	A formula derived by inference from scientific data that explains a principle operating in nature.
I	
igneous	Relating to, resulting from, or suggestive of the intrusion or extrusion of magma or volcanic activity.
immigration	Coming into the population.
independent	Each chromosome in a pair that is independent of other

assortment	chromosomes.
independent variable	A variable whose value is specified first and determines the value of one or more other values.
infrared radiation	Invisible rays just beyond the red end of the visible spectrum. Their waves are longer than those of the spectrum colors but shorter than radio waves, and have a penetrating heating effect; used in cooking and photography.
interstellar	Located, taking place or traveling among the stars, especially of the Milky Way galaxy.
ion	An atom or group of atoms that carries a positive or negative electric charge as a result of having lost or gained one or more electrons.
isotope	Any of two or more species of atoms of a chemical element with the same atomic number and nearly identical chemical behavior, but with differing atomic mass or mass number and different physical properties.
J	
jumping genes	Genes that move from one position on the chromosome to another.
K	
kinetic energy	Energy associated with motion.
L	
landform	A natural feature of a land surface.
life	An organism that has the capacity for metabolism, growth, reaction to stimuli and reproduction.
life cycle	The series of stages in form and functional activity through which an organism passes from fertilized ovum to the fertilized ovum of the next generation.
liquid	A fluid (such as water) that has no independent shape but has a definite volume, does not expand indefinitely and that is only slightly compressible.

lithosphere	The solid part of a celestial body (such as Earth), specifically, the outer part of the solid Earth composed of rock essentially like that exposed at the surface and usually considered to be about 80 kilometers (50 miles) in thickness.
M	
magma	Molten rock of material within the Earth from which igneous rock results by cooling.
magnetic reversal	Periods of time in which there was a reversal in direction of the Earth's magnetic field.
mantle	The part of the interior of a terrestrial planet, especially the Earth, that lies beneath the lithosphere and above the central core.
mass	The property of a body that is a measure of its inertia and that is commonly taken as a measure of the amount of material it contains causing it to have weight in a gravitational field.
matter	Material substance that occupies space, has mass and is composed of atoms consisting of protons, neutrons and electrons that constitutes the observable universe, and that is interchangeable with energy.
mean	The sum of a set of numbers divided by the number of elements in the set.
median	The middle number or item in a set of numbers or objects arranged from least to greatest, or the mean of the two middle numbers when the set has two middle numbers.
metamorphism	A change in the constitution of rock; specifically, a pronounced change affected by pressure, heat and water that results in a more compact and more highly crystalline condition.
meteor	Any of the small particles of matter in the solar system that are directly observable only by their incandescence from frictional heating on entry into the atmosphere.
meteoroid	One of a large number of celestial bodies of various size that appear as meteors when they enter Earth's atmosphere.

method	A systematic procedure, technique or mode of inquiry employed by or proper to a particular discipline or art.
microorganisms	An organism of microscopic or ultramicroscopic size.
metric system	A decimal system of weights and measures based on the meter and on the kilogram.
Milky Way	A broad luminous irregular band of light that stretches completely around the celestial sphere and is caused by the light of myriads of faint stars.
mineral	A soiled homogeneous crystalline chemical element or compound that results from the inorganic processes of nature.
mitochondria	Cell structure responsible for cellular respiration.
mixture	A portion of matter consisting of two or more components in varying proportions that retain their own properties.
mode	The number or object that appears most frequently in a set of numbers of objects.
model	A description or analogy used to help visualize something (such as an atom) that cannot be directly observed.
molecule	The smallest particle of a substance that retains all the properties of the substance and is composed of one or more atoms.
moon cycle	The cycle of the moon's phases, from new to full and back.
motion	An act, process or instance of changing position through time.
multicellular	Having or consisting of many cells.
mutation	A relatively permanent change in hereditary material involving either a physical change in chromosome relations or a biochemical change in the codon(s) that make up genes
N	
natural	Existing in, or produced by nature.

natural selection	The principle that in a given environment individuals having characteristics that aid survival will produce more offspring, and the proportion of individuals having such characteristics will increase with each succeeding generation.
nesting	To build or occupy a nest; settle in.
neutral	Neither acidic nor basic (as in pH).
neutrons	An uncharged elementary particle that has a mass nearly equal to that of the proton and is present in atomic nuclei.
nuclear	Used in or produced by a nuclear reaction; referring to particles or properties of an atomic nucleus.
nuclear reaction	A change in the identity or characteristics of an atomic nucleus that results when it is bombarded with an energetic particle.
nucleus	1. the positively charged central portion of an atom that comprises nearly all of the atomic mass and that consists of protons and neutrons. 2. The portion of a eukaryotic cell that is surrounded by a nuclear membrane and contains DNA.
nutrient	A nutritive substance or ingredient.
O	
observe	To watch carefully, especially with attention to details or behavior for the purpose or arriving at a judgment.
ocean trench	A long, narrow, deep depression in the ocean bed.
omnivore	An animal that feeds on both animal and vegetable substances.
orbit	A path described by one body in its revolution about another (as by the Earth about the sun or by an electron about an atomic nucleus).
organ	A differentiated structure (such as a heart, kidney, leaf or stem) consisting of cells and tissues, and performing some specific function in an organism.

organ systems	Organs working together for a specific function.
organic	Compounds containing carbon and chiefly or ultimately of biological origin.
organism	An individual constituted to carry on the activities of life by means of organs separate in function but mutually dependent; a living being.
oxidation	Combination of a substance with oxygen.
oxidize	To combine with oxygen.
P	
parasite	An organism living in, with or on another organism in which a parasite obtains benefits from a host that it usually injures.
particle	Any of the basic units of matter and energy (such as a molecule, atom, proton, electron or photon).
pattern	A reliable sample of traits, acts, tendencies or other observable characteristics.
periodic table	An arrangement of chemical elements based on the periodic law.
pH scale	A numerical measure of the acidity or alkalinity of a chemical solution.
phenomenon	A fact or event of scientific interest susceptible to scientific description and explanation.
photosynthesis	The chemical process by which chlorophyll-containing plants use light to convert carbon dioxide and water into carbohydrates, releasing oxygen as a byproduct.
physical change	A change in a substance that does not alter its chemical makeup.
physical properties	A property of a material that can be observed without changing the chemical makeup of the material.
physiology	The biological science of essential and characteristic life processes, activities and functions.

pitch	The property of a sound, especially a musical tone, that is determined by the frequency of the waves producing it; highness or lowness of sound.
planet	Any of the large bodies that revolve around the sun in the solar system.
pollution	A substance that, when added to the environment causes the environment to be harmful or unfit for living things.
population	All the plants or animals of the same kind found in a given area.
potential energy	The energy that matter has because of its position or because of the arrangement of atoms or parts.
precipitation	A deposit on Earth of hail, mist, rain, sleet or snow.
predator	An animal that lives by capturing prey as a means of maintaining life.
prey	An animal taken by a predator as food.
producer	Any of various organisms (such as a green plant) which produce their own organic compounds from simple precursors (such as carbon dioxide and inorganic nitrogen) and many of which are food sources for other organisms.
prokaryotic	A cellular organism (such as bacterium or a blue-green alga) that does not have a distinct nucleus.
property	A quality or trait belonging to an individual or thing.
proton	A stable subatomic particle occurring in all atomic nuclei with a positive electric charge equal in magnitude to that of an electron.
Q	
qualitative	Involving quality or kind.
quantitative	Involving the measurement of quantity or amount.

R

Radiation	The transfer of heat by radiation (such as energy transfer). The process of emitting radiant energy in the form of waves or particles (such as particle emission).
react	To undergo chemical reaction (chemically).
reactant	A substance that enters into and is altered in the course of a chemical reaction.
recycle	To process (as liquid body waste, glass or cans) in order to regain material for human use.
reference point	A basis or standard for evaluation, assessment or comparison; a criterion.
reflection	The throwing back by a body or surface of light, heat or sound without absorbing it.
refraction	Deflection from a straight path undergone by a light ray or energy wave in passing obliquely from one medium (such as air) into another (such as glass) in which its velocity is different.
repel	To force away or apart, or tend to do so by mutual action at a distance.
replicate	To duplicate experiments, procedures or samples.
reproduction	The process by which organisms give rise to offspring and which fundamentally consists for the segregation of a portion of the parental body by a sexual or an asexual process, and its subsequent growth and differentiation into a new individual.
resource	Industrial materials and capacities (as mineral deposits and waterpower) supplied by nature (earth science) and substances used by an organism for survival (biology).
respiration	The physical and chemical processes by which an organism supplies its cells and tissues with the oxygen needed for metabolism and relieves them of the carbon dioxide formed in energy-producing reactions.
rotation	The turning of a body part about its long axis as if on a pivot.

S

scavenger	An organism that feeds habitually on refuse of carrion.
Scientific law	A statement of an order or relation of phenomena that, so far as is known, is invariable under the given conditions.
scientific method	Principles and procedures for the systematic pursuit of knowledge involving the recognition and formulation of a problem, the collection of data through observation and experiment, and the formulation and testing of hypotheses.
scientific theory	A plausible or scientifically acceptable general principle or body of principles offered to explain phenomena.
sediment	Material deposited by water, wind or glaciers.
segregation	The separation of two alleles in a heterozygote when gametes are formed.
significant figure	Each of the digits of a number that are used to express it to the required degree of accuracy.
solid	A substance that does not flow perceptibly under moderate stress, has a definite capacity for resisting forces (such as compression or tension) that tend to deform it, and under ordinary conditions retains a definite size and shape.
solubility	The amount of a substance that will dissolve in a given amount of another substance.
solution	An act, or the process by which a solid, liquid or gaseous substance is homogeneously mixed with a liquid or sometimes a gas or solid.
sound waves	Mechanical radiant energy that is transmitted by longitudinal pressure waves in a material medium (such as air) and is the objective cause of hearing.
species	A group of organisms consisting of similar individuals capable of exchanging genes or interbreeding.
sperm	A male gamete.
star	A natural luminous body visible in the sky, especially at night.

structure	The arrangement of particles or parts in a substance or body.
survival	The continuation of life or existence.
system	1. A group of body organs that together perform one or more vital functions. 2. An organized group of devices, parts or factor that together perform a function or drive a process (weather systems, mechanical systems).
T	
technology	Human innovation in action that involves the generation of knowledge and processes to develop systems that solve problems and extend human capabilities. The innovation, change, or modification of the natural environment to satisfy perceived human needs and wants.
theory	A supposition or a system of ideas intended to explain something, especially one based on general principles independent of the thing to be explained.
tides	The alternate rising and falling of the surface of the ocean and water bodies (such as gulfs and bays) connected with the ocean that occurs usually twice a day, and is caused by the gravitational attraction of the sun and moon occurring unequally on different parts of the Earth.
tissue	An aggregate of cells usually a particular kind together with their intercellular substance that form one of the structural material of organisms.
tool	A device that aids in accomplishing a task, a form of technology.
trait	An inherited characteristic.
transform	To change in composition or structure.
U	
unit	A determinate quantity (such as of length, time, heat or value) adopted as a standard of measurement.
unity	The state of being united into a whole.

uplift	To cause (a portion of Earth's surface) to rise above adjacent areas.
V	
variable	A quantity that may assume any one of a set of values.
velocity	The rate of change of position and direction with respect to time.
virus	Any of various submicroscopic pathogens consisting essentially of a particle of nucleic acid enclosed in protein and able to replicate only within a living cell.
volcano	A vent in the crust of the Earth or another planet from which usually molten rock, ash and steam are ejected.
W	
water cycle	The sequence of conditions through which water passes from vapor in the atmosphere through precipitation upon land or water surfaces and ultimately back into the atmosphere as a result of evaporation and transpiration.
wave	A disturbance or variation that transfers energy progressively from point to point in a medium, and that may take the form of an elastic deformation or of a variation of pressure, electric or magnetic intensity, electric potential, or temperature.
wavelength	The distance between successive crests of a wave.
weather	The state of the atmosphere with respect to heat or cold, wetness or dryness, calm or storm, clearness or cloudiness.
weathering	To subject to the action of the elements.