

Subject Philosophy for Science

Science is included in the curriculum of St. John's Lutheran School because Science is the study of relationships in God's creation. The study of Science helps young people develop the knowledge and skills necessary to make informed and reasoned decisions as stewards of our world according to God's will. Without this foundation, students cannot develop nor acquire the knowledge and skills necessary to act as caretakers of God's created world. Students will use these skills to analyze and explore the disciplines of Physical and Earth Sciences, Chemistry, and Biology. Using these disciplines, students will appreciate and fulfill their role in Creation.

Exit Goals

- A. Identify and Explain God's presence in all aspects of His creation encompassing Physical, Earth, Chemistry, and Biological studies.**
- B. Apply scientific methods, tools, and technologies to investigate and care for God's creation.**
- C. Use and understand scientific terms and/or concepts correctly.**
- D. Analyze scientific issues from a Christian perspective.**

Standards/ Objectives adapted from the following:

Wisconsin Model Academic Standards for Science

<http://dpi.wi.gov/science/standards>

Integrating the Faith A Teacher's Guide for Curriculum in Lutheran Schools; Concordia Publishing, St. Louis, MO

Kindergarten

Students in Kindergarten will by the end of Kindergarten show, demonstrate, and understand:

- A.1 How all living things depend on each other.
- A.2 The basic needs of living organisms and how they are met.
- A.3 The basic food groups, foods and snacks that promote good health in the bodies God gave us.
- A.4 Changes that occur over time in science related events.
- B.1 How to ask questions about organisms, objects, and events then communicate explanations about investigations at age appropriate levels.
- B.2 How to predict, observe, and record science related investigations such as changes in size, temperature, color, position, and balance.
- B.3 How to explain forces that cause objects to move by pushing or pulling.
- C.1 How to identify a particular organism or object as living or nonliving.
- C.2 How to identify matter as a liquid, solid, or gas.
- C.3 How to give examples of ways that rocks, soil, and water are useful.
- C.4 How to construct graphs, tables, maps, and/or charts to organize, examine, and evaluate information at age appropriate levels.
- D.1 How to investigate changes through time of living things (adaptation, endangered species, extinct species) through a Christian perspective.

Grade 1

Students will at 85% efficiency by the end of Grade One be able to:

- A.1 Discuss the interrelationship of all living things, the value of the variety God created, and the responsibility God gave to humans to tend the earth.
- A.2 Compare different types of environments and how they sustain plant and animal life.
- A.3 Identify ways to keep our bodies healthy through diet, exercise, and wise choices.
- B.1 Plan and conduct simple descriptive investigations.

- B.2 Observe and record changes and growth in plant and animal life.
- B.3 Observe and record effects of changing seasons and weather on God's creation.
- C.1 Identify ways the earth provides resources for life and identify various habitats.
- C.2 Identify and explain the parts and functions of plants and animals.
- C.3 Explain life cycles of animals and plants.
- C.4 Identify changes in weather and seasons.
- D.1 Show how scientific exploration has made positive contributions to society through a Christian perspective.
- D.2 Investigate changes through time in plant, animals, and earth formations (extinct animals/fossils).

Grade 2

Students will at 85% efficiency by the end of Grade Two be able to:

- A.1 Identify habitats as a wonderful creation of God.
- A.2 Use science themes to describe the seasons.
- A.3 Understand that substances can exist in different states- solids, liquids, and gasses.
- A.4 Identify what is found in the day and night sky.
- B.1 Investigate how living things use energy.
- B.2 Identify, predict, and test uses of heat to cause change such as melting and evaporation.
- B.3 Identify and record forces of gravity, magnets, and water on the earth and each other.
- B.4 Identify and observe gravity, electricity, and magnets as sources of force.
- C.1 Explain using proper terms the interactions between organisms and their habitat.
- C.2 Show how information is gained through experimentation and investigation.
- C.3 Demonstrate knowledge of cycles found on earth.
- D.1 Use encyclopedias, source books, texts, computers, teachers, parents, Bible, and Pastor to help answer science related questions from scientific and Christian viewpoints.
- D.2 Explore various jobs found in the science field and apply a Christian world view.

Grade 3

Students will at 85% efficiency by the end of Grade Three be able to:

- A.1 Describe connections among living and non-living things in various environments.
- A.2 Find and explain patterns and cycles in the earth's daily, yearly, and long-term changes.
- A.3 Group and/or classify objects and substances based on properties.
- B.1 Classify and sequence organisms, objects, and events based on properties and patterns.
- B.2 Manipulate, predict, and identify parts that, when separated from the whole or reassembled, may result in the part or whole not working.
- C.1 Group and/or classify objects and substances based on properties of earth materials.
- C.2 Observe and describe changes in form, temperature, color, speed, and direction of objects and construct explanations using appropriate vocabulary for the changes.
- C.3 Describe some cycles, structures, and processes that are found in simple systems.
- D.1 Discuss living things of long ago: extinct animals, and reasons for their demise, and apply this to endangered species today.
- D.2 Show how the major developments of scientific knowledge in the earth, space, life, environmental, or physical science have changed over time.

Grade 4

Students will at 85% efficiency by the end of Grade Four be able to:

- A.1 Discover how each organism meets its needs for water, nutrients, protection, and energy in order to survive.
- A.2 Investigate that earth materials are composed of rocks and soils and correctly use the appropriate vocabulary terms.
- A.3 Classify and identify minerals according to hardness, luster, streak, and color.
- A.4 Interpret how landforms are the results of a combination of constructive and destructive forces such as deposition or sediment and weathering.
- B.1 Observe measure, record, analyze, predict, and illustrate changes during investigations.
- B.2 Use data students have collected to develop explanations and answer questions generated by investigations.

C.1 Identify and describe the roles of some organisms in living systems and parts in non-living systems.

C.2 Use the vocabulary of the unifying themes to ask questions about objects, organisms, and events being studied.

C.3 Communicate results of investigations in ways their audiences will understand through visual or written means.

D.1 Analyze from a creationist and evolutionist viewpoint how adaptive characteristics help individuals within a species to survive.

D.2 Support their conclusions with logical arguments from a Christian perspective.

Grade 5

Students will at 85% efficiency by the end of Grade Five be able to:

A.1 Understand the structure and function of cells, organs, tissues, organ systems, and whole organisms.

A.2 Understand how chemical interactions and behaviors lead to new substances with different properties.

A.3 Using the science themes, explain and predict changes in major features of land, water, and atmospheric systems.

B.1 Explain how the general rules of science apply to the development and use of evidence in science investigations, model making, and applications.

B.2 Demonstrate that new substances can be made when two or more substances are chemically combined and compare the properties of the new substances to the original substance.

B.3 Use models and explanations to predict actions and events in the natural world.

C.1 Identify how structure complements function at different levels of organization including organs, organ systems, organisms, and populations.

C.2 Use inferences to help decide possible results of their investigations, use observations, and check their inferences.

C.3 Analyze a given community and give examples of producers, consumers, and decomposers.

C.4 Ask questions about organisms, objects, and events then synthesize the information to exhibit critical thinking.

D.1 Evaluate the impact of research on scientific thought, society, and the environment from a Christian perspective.

D.2 Use accepted scientific and religious knowledge, models, and theories to explain investigative results and to raise further questions about their investigations.

D.3 Analyze and describe adaptive characteristics that result in an organisms unique niche in an ecosystem.

Earth Science

Students will at 85% efficiency by the end of the study of Earth Science be able to:

A.1 Identify and explain patterns in the environment including seasons, climate and weather, ocean currents, soil movements, the rock and water cycles, and erosion using scientific themes.

A.2 Identify and explain the structures of the earth and how they function including plates, earthquakes, and volcanoes and their effects on the earth and its inhabitants.

A.3. Identify how humans use resources, how they impact Creation, and how they can conserve those resources effectively.

A.4 Make inferences and draw conclusions about the effects of human activity on Earth's resources.

A.5 Use scientific themes to explain and predict changes in major features of land, water, and atmospheric systems.

B.1 Explain the Scientific Method of Investigation using a hypothesis, investigation, data collection, analysis, and conclusions.

B.2 Demonstrate that repeated investigations may increase the reliability of results.

B.3 Use computer software and other technologies to organize, process, and present data.

B.4 Use technology to collect, record, and organize data from an investigation.

B.5 Use models and explanations to predict future events in the natural world.

B.6 Conduct investigations to explain scientific concepts.

C.1 Identify and explain the parts of the solar system and the function of each part.

C.2 Identify questions that can be reasonable investigated given available equipment and skills.

C.3 Identify ways Creation supports the needs of life.

D.1 Explain how the major developments and theories of Earth Science have developed and changed over time.

D.2 Identify and explain past events that have led to the formation of the earth's renewable, nonrenewable, and inexhaustible resources and explain the differences between them.

D.3 Project the consequences of human interaction with Creation and ways the negative impacts can be reduced.

D.4 Describe scientific events from a Christian perspective.

Life Science (Biology)

Students will at 85% efficiency by the end of the study of Life Science be able to:

A.1 Identify the basic needs of living organisms and explain how organisms interact with each other and their environments to meet those needs.

A.2 Explain how organisms inherit their unique traits and how they age and adapt.

A.3 identify and explain positive and negative health, hygiene, and diet habits and their consequences.

B.1 Review and practice the Scientific Method of Investigation using a hypothesis, investigation, data collection, analysis, and conclusions through the use of technology and other means.

B.2 Use technology to collect, record, and organize data from an investigation.

B.3 Use models and explanations to predict future events in the natural world.

B.4 Conduct investigations to explain scientific concepts.

C.1 Explain ways Creation supports the needs of life.

C.2 Identify and explain the parts and functions of cells and organisms.

C.3 Explain the role and function of genes, chromosomes, DNA, and heredity in reproduction.

C.4 Explain the results of a scientific investigation to an audience of peers in ways that allow them to understand.

D.1 Explain the natural processes of extinction and adaptation and how they relate to the false Theory of Evolution.

D.2 Explain plant and animal reproduction and understand the need for modesty and maturity in its discussion.

D.3 Explain the limitations of Science when related to social issues.

D.4 Explain how the major developments and theories of Life Science have developed and changed over time.

D.5 Describe scientific events from a Christian perspective.

Physical Science and Chemistry

Students will at 85% efficiency by the end of the study of Physical Science and Chemistry be able to:

A.1 Explain the motion of objects by describing the forces acting on them while conducting investigations.

B.1 Identify, describe, and measure gravity, electricity, heat and magnetism.

B.2 Identify and explain the function of simple and compound machines.

B.3 Identify, explain, and measure the characteristics of rocks and minerals.

B.4 Identify and explain potential and kinetic energy.

B.5 Identify and explain the differences between the states of matter and how they transition.

B.6 Demonstrate the Scientific Method of Investigation by designing an investigation using a hypothesis, investigation, data collection, analysis, and conclusions.

B.7 Measure and record the physical characteristics of solids, liquid, and gasses.

B.8 Classify matter based on its physical and chemical properties.

B.9 Use technology to collect, record, and organize data from an investigation.

B.10 Use models and explanations to predict future events in the natural world.

B.11 Conduct investigations to explain scientific concepts.

C.1 Identify and explain the parts and functions of molecules and atoms.

C.2 Identify and explain the basic representations in the Periodic Table and how elements combine to form compounds.

C.3 Identify and explain the physical and chemical properties of elements and compounds including density, boiling/melting points, conductivity, magnetism, solubility, and chemical reactions.

C.4 Read and write chemical symbols and sentences to identify elements, compounds, and common chemical reactions and explain how chemical reactions and behaviors lead to new substances with different properties.

- C.5 Explain speed, velocity, acceleration, friction, and momentum.
- C.6. Explain waves as they relate to light and other energy.
- C.7 Explain the basic Laws of Science.
- C.8 Defend the results and conclusions of a scientific investigation the student conducted.
- D.1 Explain how the major developments and theories of Physical Science have developed and changed over time.
- D.2 Evaluate scientific evidence using various media to address social issues.
- D.3 Describe how scientific discoveries have contributed to meeting personal needs, including hygiene, nutrition, and health care.
- D.4 Describe scientific events from a Christian perspective.