Science Curriculum

Philosophy

Science at Word of Life Lutheran School is taught in the light of God's Word. Although the world may promote its philosophies of humanism and evolution as the truth, we assert that God's Word is Truth.

We teach science to better understand the created world of our God. All areas of learning in the fields of science reveal the all-powerful hand of God revealing Himself in nature as He works as the creator and ruler of the universe.

The creation has been affected by sin resulting in frustration, death, and decay. We Christians live in a sin-blemished world. Science teaches us to be good stewards of the world the Lord has given us.

Our science curriculum allows children to see the wisdom and skill of our Creator. Through hands on learning the students will be actively engaged in experiments, projects and presentations. These opportunities will allow them to develop skills such as observing, comparing, hypothesizing, predicting, measuring, testing and interpreting for a better understanding of the world our Lord created. The study of life science, physical science, and earth science allow us to apply the laws of science to our daily lives.

The core of our curriculum is the Project Lead the Way Launch and Gateway program. Their activity-, project-, and problem-based (APB) instructional design centers on hands-on, real-world activities, projects, and problems that help students understand how the knowledge and skills they develop in the classroom may be applied in everyday life. The APB approach scaffolds student learning through structured activities and projects that empower students to become independent in the classroom and help them build skill sets to apply to an open-ended design problem.

This approach provides students with unique opportunities to work collaboratively, identify problems, apply what they know, persevere through challenges, find unique solutions, and lead their own learning.

One unit in 7th and 8th grade is a FOSS (Full Option Science) unit on Planetary Science. Like PLTW, FOSS is a project based curriculum which allows for hands on learning.

Our course of study is as follows:

Kindergarten	Exploring Design Pushes and Pulls Human Body Animal Algorithms
First Grade	Light and Sound Light: Observing Sun, Moon and Stars Animal Adaptions
Second Grade	Properties of Matter Form and Function The Changing Earth
Third Grade	Science of Flight Forces and Interaction Variation of Traits Operation Science Rocks and Minerals
Fourth Grade	Collisions Conversions Input and Output: Computer Systems Input and Output: Human Brain
Fifth Grade	Intro to Engineering Design Process Infection Detection Infection Modeling and Simulation Energy and the Environment
Sixth Grade	Intro to Engineering Design Process Robotics and Automation Robotics and Automation: Challenge Medical Detectives
Seventh Grade	Intro to Engineering Design Process App Creators Computer Science for Innovators and Makers Make A Difference Fair
Eighth	Design and Modeling Energy and the Environment Green Architecture FOSS Planetary Science

Preschool

Life Science

1. Demonstrate the use of all five senses and explain unsafe situations in using each sense.
3. Distinguish between living and nonliving things.
4. Tend plants and animals (or monitor pets from home via reports from other children).

Earth Science

1. Connect lighted spaces to sun, moon and artificial sources.
2. Identity a day.
3. Recognize a week.
4. Keep a daily weather record.
5. Describe differences in seasons.
6. Observe consciously the environment.
7. Identify the globe as a symbol of the earth.
8. Observe and describe how plants grow from seeds and that they need air, soil, light and water to grow.

Physical Science

1. Classify objects on the basis of properties (i.e. shapes, size, color, matter, etc.).
2. Explore color.
3. Relate objects and shadows.
4. Perform simple experiments.

Kindergarten

Life Science

1. Learn how plants need air, soil, light and water to grow.
2. Learn how plants grow from seeds and that each plant has its own special seed.
3. Learn about animals as pets, work animals, jungle animals, farm animals and animals that live in the woods.
4. Learn about the five senses and the body parts where they are found.
5. Learn about the body's systems.
6. Learn good hygiene practices and do a study of nutrition.

Earth Science

1. Learn about the sky and the stars and how the sky looks differently at night and during the day.
2. Learn about the weather and learn the symbols that show the different weather conditions.
3. Learn about using a thermometer to see whether the temperature goes up or down.

Physical Science

1. Explore pushes and pulls and how they affect the objects that they are using.
2. Learn about lengths and weights of different objects.
3. Learn the design process.
4. Learn about matching objects by using more than one attribute.

Other resources: ***Applying the Standards STEM K***
20 Turnkey Stem Projects to Intrigue, Inspire and Challenge

First and Second

Life Science

1. Identify living/non-living things.
2. Define "habitat".
3. Tell how plants, animals and humans use air, water, and soil.
4. Discuss plant structure.
5. Show the growth stages of plants, animals and humans.
6. Compare and contrast animals.
7. Compare body characteristics.
8. Discuss the food pyramid and nutrition.
9. Discuss staying healthy through exercise and sleep.
10. Discuss dental hygiene.

Physical Science

1. Observe and describe how magnets attract and repel.
2. Discuss the properties of solids, liquids and gases.
3. Explore the characteristics of light.
4. State that light and sound behave as waves.
5. Explain how we hear sounds.

Earth Science

1. Discuss weather changes related to the seasons.
2. Observe and record changes in the weather.
3. Study models/posters of the solar system.
4. Observe the earth as a globe.
5. Brief and basic discussion of the planets.

Third and Fourth

Life Science

1. Compare animal and plant cells.
2. Describe the characteristics of an organism.
3. Explore ways living things can be classified.
4. Understand how living and non-living things interact in an ecosystem.
5. Explore factors that change ecosystems.
6. Describe the structures and function of roots, stems, and leaves.
7. Contrast photosynthesis and respiration.
8. Trace the life cycle of flowering plants.
9. Describe the structure and function of organ systems in animals.
10. Describe the ways animals change as they grow.
11. Compare and contrast different ways animals reproduce.
12. Discover how body parts and behaviors help animals survive.

Physical Science

1. Identify and describe matter.
2. Measure matter using non-standard and standard units of measure.
3. Understand that matter can be classified, mixed, and combined.
4. Compare and contrast physical and chemical changes.
5. Understand how speed, force, energy, and work are related.
6. Discover how machines make work easier.
7. Understand how speed, force, energy and work are related.
8. Describe the characteristics of static electricity.
9. Describe how electric circuits work.
10. Describe the properties of magnets and magnetic fields.
11. Understand how electricity is made.

Earth Science

1. Compare, contrast, and identify rocks and minerals.
2. Describe the rock cycles.
3. Explain how Christians can understand fossils.
4. Explain how forces change the shape of the earth.
5. Describe the three different soil horizons.
6. Describe the structure of the earth.
7. Explain the reasons for day and night, the seasons, and the phases of the moon.
8. Identify the planets and other bodies in the solar system.
9. Describe the physical features of the oceans.
10. Explain how ground water forms.
11. Describe the steps of the water cycle.
12. Describe how ocean currents and tides are produced.
13. Explain how water travels through the soil and under ground.
14. Explore ways to use and conserve water.
15. Understand the conditions of our atmosphere which create weather.
16. Explain the factors which affect climate.

Fifth and Sixth

Life Science

1. Observe how all plants have common characteristics.
2. Explain how all plants have certain parts with the same function.
3. Explain how plants make food and produce oxygen through photosynthesis.
4. Describe the differences and similarities between vascular and nonvascular plants.
5. Observe and explain how fertilized flowers produce seeds that become plants.
6. Compare seed plants.
7. Explain how plants have certain behaviors and adaptations that help them survive.
8. Discover how animals can be classified using various characteristics.
9. Describe how ecosystems have living and non-living parts.
10. Explain how food chains and webs describe the feeding relationships in a ecosystem.
11. Observe and describe how the Earth's systems recycle materials.
12. Compare how living and non-living things interact in an ecosystem.
13. Explain how ecosystems go through both slow and sudden changes.

Earth Science

1. Explain how forces on and under the Earth shape its surface.
2. Describe the earth's crust and how it contains many types of minerals.
3. Explain how rock's can be classified according to their composition and properties.
4. Describe how the Earth's atmosphere supports life on earth.
5. Investigate how fresh water is constantly renewed by the water cycle.
6. Explain how some energy resources and inexhaustible while some run out.
7. Investigate how oceans are an important natural resources.
8. Discover how the sun warms the earth's surface
9. Describe how water on the earth's surface changes form and affects weather.
10. Explain how clouds form and produce precipitation.
11. Describe how wind is formed.
12. Describe were weather changes occur.
13. Investigate severe storms.
14. Investigate climates.

Physical Science

1. Investigate and describe matter.
2. Describe and explain what matter is made of.
3. Explain the states of matter.
4. Describe mixtures and solutions.
5. Explain how matter can undergo chemical and physical changes.
6. Investigate acids and bases.
7. Explain how chemical changes often release energy.
8. Investigate Newton's three laws of motion.
9. Describe the force of gravity.
10. Investigate sound waves and their different aspects.
11. Describe how light is a form of energy.
12. Explain the reflection and refraction of light.
13. Investigate the electromagnetic spectrum.
14. Explain forces and motion.
15. Describe speed and velocity as characteristics of motion.
16. Investigate and describe simple machines.

Units Plants; Animals; Weather and Climate; Acids, Bases and Solutions

Field Trips Mequon Nature Preserve, Water Works (Viola)

Seventh and Eighth

Life Science

1. Organize their learning of plants and animals with classification charts.
2. Compare the life cycles of various organisms.
3. Name the structure and functions of the parts of a flowering plant — stems, roots, leaves, flowers, etc.
4. Explain the food web.
5. Investigate the diversity among animals from amoeba to mammals.
6. Compare transpiration and respiration in plants and animals.
7. Compare coordination, support, and locomotion in animals of varying complexity.
8. Compare reproduction across the animal kingdom.
9. Explain how development is controlled in animals.
10. Explain diffusion and osmosis and give examples of each.
11. Discuss cell division and mitosis meiosis and explain what happens to chromosomes during mitosis and meiosis.
12. Describe the skin and list examples of its function.
13. Explain the structures of the bones and how pairs of muscles help bones move.
14. Explain the structures and functions of the parts of the digestive, respiratory, circulatory, excretory, nervous, endocrine and reproductive systems.
15. Observe and compare plant and animal cells.
16. Identify interrelations among organisms in nature.
17. Evaluate the effect of drugs and alcohol on human systems.
18. Discuss and practice elements of good nutrition.

Earth Science

1. Evaluate several current problems in the biosphere and ways in which man affects the state of the biosphere.
2. Explain photosynthesis, the water cycle, nitrogen cycle and other natural cycles.

Physical Science

1. Explain the atomic theory and list some differences between atoms and molecules.
2. Use the periodic table to describe atomic relationships.
3. Write and explain balanced chemical equations for everyday processes.
4. Measure forces and use them to accelerate carts and lift objects.
5. Measure the energy of work (f*d), kinetic energy of carts (112 my2), potential of gravity and momentum (my).
6. Use the atomic molecular model to explain the behavior of acids and bases.
7. Learn to produce, collect and identify common gases.
8. Use the ideas of chemistry to explain the changes in everyday things — kitchen chemistry; air, land, and water pollution; the ozone problem; organic molecules.
9. Demonstrate the electrical nature of matter — circuits, static electricity, dissociation of water, etc.
10. Order the behavior of wave and particle behavior.
11. Find the earth's location in space and how scale affects space study.
12. Quantify the relationships between the earth and the sun.
13. Identify the reason for the seasons.
14. Explore what man has learned about the moon and what exploration remains.
15. Demonstrate the cause of the phases of the moon.
16. Identify the major classifications of the cosmos and their systems.
17. Learn how a spectroscope is used to identify if planets could support the components of life.

Health Science

1. Discuss and practice elements of good nutrition.
2. Identify the long-term benefits of aerobic activity.
3. Evaluate the effects of drug/alcohol on human systems.

Field Trip Ideas

1. Brewer Day
2. Water Explorers (Milwaukee County Parks)
3. Biodiversity Basic (Milwaukee County Parks)
4. National Weather Service Field Office
5. Spinning Top and Yo-Yo Museum
6. Kettle Moraine State Forest
7. Discovery World
8. Havenswood State Forest
9. Urban Ecology Center
10. UW-Madison Biotech Center

Stewardship Ideas

1. Kompost
2. Wilson Park
    a. Cleanup
    b. Invasive species