Science

GRADE 5

Life Science	Physical Science	Earth and Space Science
Plants Kingdoms Groups of Plants Plant parts Photosynthesis **Plant Reproduction and Response** Life Cycles of seedless and seed plants Responses and Traits • Inherited vs. learned	**Motion, Forces and Work:** Motion • Distance-time graphs • Speed/acceleration • Newton's 3 laws • Momentum Machines and Work • Simple and Compound Machines • Potential and Kinetic energy • Structure and mechanical advantage of machines • Efficiency • Flight technology	**Weather and Climate:** Causes of Weather • Sun's energy • Atmosphere • Air pressure • Water Cycle ▪ clouds ▪ precipitation Patterns • air masses and fronts • severe storms • extreme weather conditions • climates

STANDARD 1
The student *understands and uses scientific concepts and principles.*

To meet this standard, the student will:

<u>Benchmark 5.1.1</u>: Use properties to identify, describe, and categorize substances, materials, and objects

Indicator:
Physical

5.1.1.1 Describe objects using sensory terms and properties including shape, size, color, texture, hardness, weight, length and volume in metric units

<u>Benchmark 5.1.2</u>: Identify, describe, and categorize living things based on their characteristics

Indicators:
Life

5.1.2.1 Identify the principle characteristics used to classify living things
5.1.2.2 Use characteristics to classify living organisms into groups with similar features

<u>Benchmark 5.1.3</u>: Measure properties and characteristics

Indicators:
Physical

5.1.3.1 Use instruments to measure time, temperature, length, mass, weight, and volume
5.1.3.2 Identify and manage sources of error in measurements
5.1.3.3 Understand the goals of measurement and the usefulness of standard measurements
5.1.3.4 Estimate and check measurements

Key: <u>1</u>. Grade 1.<u>1</u> Standard 1.1.<u>1</u> Benchmark 1.1.1.<u>1</u> Indicator

Benchmark 5.1.4: Recognize the components, structure, and organization of systems and the interconnections within and among them

Indicators:

Earth

5.1.4.1 Make predictions about the dependence of weather conditions on atmospheric conditions
5.1.4.2 Name and use instruments used to measure weather conditions
5.1.4.3 Describe various factors which influence regional weather patterns including location, wind, geographic features and the transfer of energy from the sun

Life

5.1.4.4 Describe how each organism is unique
5.1.4.5 Explain energy cycles in nature
5.1.4.6 Identify and state the basic needs of plants

Benchmark 5.1.5: Understand that interactions within and among systems cause changes in matter and energy

Indicators:

Physical

5.1.5.1 Define familiar forms of energy including mechanical (potential and kinetic)
5.1.5.2 Distinguish between physical changes and chemical changes
5.1.5.3 Investigate ideas of motion and speed with familiar objects
5.1.5.4 Identify factors which affect the motion of an object
5.1.5.5 Understand that when forces on an object are balanced, the object will remain at rest or move at a constant speed and direction
5.1.5.6 Observe, analyze, and predict properties of one-dimensional motion including position, distance, average speed, and change of speed
5.1.5.7 Describe the linear motion of an object using concepts such as speed, acceleration, time intervals, and position
5.1.5.8 Explain how an object's motion is affected by forces such as friction, tension, and gravity

Earth

5.1.5.9 Describe the water cycle
5.1.5.10 Compare and contrast cycles and other patterns of change
5.1.5.11 Explain how energy from the sun drives the water cycle
5.1.5.12 Explain the relationships among the energy from the sun, photosynthesis, and the energy needs of living organisms

Benchmark 5.1.6: Construct and use models to predict, test, and understand scientific phenomena

Indicators:

5.1.6.1 Describe how models are similar to and different from the systems they represent
5.1.6.2 Construct a physical model
5.1.6.3 Construct and interpret scale drawings

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STANDARD 2
The student *conducts scientific investigations to expand understanding of the natural world.*

To meet this standard, the student will:

Benchmark 5.2.1: Plan and implement scientific investigations

Indicators:

5.2.1.1 Distinguish between an observation and an inference
5.2.1.2 Develop questions and testable hypotheses in response to observations
5.2.1.3 Use appropriate tools to collect data and safely test a hypothesis
5.2.1.4 Individually and collaboratively plan an experiment; analyze issues affecting the design
5.2.1.5 Conduct a safe, controlled experiment
5.2.1.6 Develop and communicate procedures, predictions, descriptions, results, and explanations
5.2.1.7 Understand and follow proper safety procedures

Benchmark 5.2.2: Think logically, analytically, and creatively

Indicators:

5.2.2.1 Use several different strategies to approach questions and problems
5.2.2.2 Distinguish among evidence, explanation, and opinion
5.2.2.3 Make predictions and create explanations by drawing inferences and recognizing patterns and relationships (especially mathematical relationships)

Benchmark 5.2.3: Practice the principles of scientific inquiry

Indicators:

5.2.3.1 Demonstrate that science is one way of looking at the world
5.2.3.2 Accurately record and report a series of observations
5.2.3.3 Analyze a set of principles based on knowledge, and recognize what is still unknown or unanswered
5.2.3.4 Develop conclusions based on evidence
5.2.3.5 Realize and explain that scientific understanding can come from unexpected results

Benchmark 5.2.4: Understand the relationship between evidence and scientific explanation

Indicator:

5.2.4.1 Properly use terms such as hypothesis, law, principle, and theory to describe scientific explanations

Key: 1. Grade 1.1 Standard 1.1.1 Benchmark 1.1.1.1 Indicator

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STANDARD 3
The student *applies science knowledge and skills to solve problems and meet challenges.*

To meet this standard, the student will:

Benchmark 5.3.1: Identify problems and challenges in which science knowledge and skills can be applied

Indicators:

5.3.1.1 Identify a relevant problem or challenge to which science knowledge and skills can be applied
5.3.1.2 Identify the components of the problem
5.3.1.3 Write a hypothesis and predict possible outcomes

Benchmark 5.3.2: Research, design, and test a variety of ways to address problems and/or challenges

Indicators:

5.3.2.1 Use scientific tools and methods to individually and collaboratively research, design, test, and compare alternative solutions to a problem
5.3.2.2 Record the steps to test the hypothesis
5.3.2.3 Identify and collect necessary equipment and materials for experimentation

Benchmark 5.3.3: Evaluate solutions and consequences

Indicators:

5.3.3.1 Evaluate and explain solutions to a problem under various constraints
5.3.3.1 Organize and transfer outcomes into narrative, pictorial and/or graphic format

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STANDARD 4
The student *uses effective communication skills and tools to build and demonstrate understanding of science.*

To meet this standard, the student will:

Benchmark 5.4.1: Use listening, observing, and reading skills to obtain scientific information

Indicators:

5.4.1.1 Listen to and paraphrase someone describe his/her own observations
5.4.1.2 Ask questions to clarify
5.4.1.3 Read, understand, and summarize informative science texts

Benchmark 5.4.2: Use writing and speaking skills to organize and express science ideas

Indicators:

5.4.2.1 Construct, interpret, and utilize graphs and other graphical displays of information
5.4.2.2 Write informative reports that make proper use of scientific terminology, data, symbols, diagrams, tables, and graphs
5.4.2.3 Present information orally to convince an audience

Key: 1. Grade 1.1 Standard 1.1.1 Benchmark 1.1.1.1 Indicator

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STANDARD 5
The student *understands how science knowledge and skills are connected to other subject areas and real-life situations.*

To meet this standard, the student will:

Benchmark 5.5.1: Use mathematics to enhance scientific understanding

Indicators:

5.5.1.1 Use statistical methods, estimation skills, symbols, graphs, numbers, and tables to make predictions and describe and analyze results

Benchmark 5.5.2: Examine the relationship among science, society, and the workplace

Indicators:

5.5.2.1 List examples of how science and technology influence everyday life
5.5.2.2 Recognize and explain some short-term and long-term consequences of science and technology in the past and for the future
5.5.2.3 State the relationship between science and mathematics to occupational/career areas of interest and
5.5.2.4 Recognize the preparation, skills, and knowledge needed to pursue these areas

Key: 1. Grade 1.1 Standard 1.1.1 Benchmark 1.1.1.1 Indicator

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STANDARD 6
The student *understands how science knowledge carries with it responsibility for its application.*

To meet this standard, the student will:

<u>Benchmark 5.6.1</u>: The student will understand the ethical issues inherent in scientific research (Ethics)

Indicators:

5.6.1.1 Define the term "ethical issues"
5.6.1.2 Understand that scientific knowledge can be used in more ways than scientists intend

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STANDARD 7
The student *applies a Christian perspective to scientific concepts and principles.*

To meet this standard, the student will:

<u>Benchmark 5.7.1</u>: Understand that the Bible and the findings of science do not conflict

Indicators:
Earth
5.7.1.1 Identify that the Bible tells us that God is the creator of our earth, including weather and climates
Life
5.7.1.2 Use words and drawings to explain that God created the complex systems and cycles of plants, including photosynthesis

<u>Benchmark 5.7.2</u>: Understand that the Bible teaches us that God is the creator of everything

Indicators:
Earth
5.7.2.1 Identify God as the creator of different kinds of weather patterns and climates
Life
5.7.2.1 State that God created complex plant systems so that we can better enjoy his world

<u>Benchmark 5.7.3</u>: Understand that God preserves and controls His creation, the world we study in science, so that it continues to function as He planned
Indicators:
Physical
5.7.3.1 Explain how the patterns of energy and matter display God's orderliness
Earth
5.7.3.2 Identify weather patterns in God's creation that prove he is in control
Life
5.7.3.3 Explain that the consistent pattern of plants and human interdependence show God's control and plan
5.7.3.4 Use words and drawings of plants' life cycles and reproduction to explain that God created plants in an orderly fashion

<u>Benchmark 5.7.4</u>: Understand that God created for His own purpose, and creation is meant to praise and glorify God
Indicators:
Physical
5.7.4.1 Identify how humans can use machines in ways that will glorify God
Life
5.7.4.2 Identify ways in which all of God's creation, including the plants, praises God

Benchmark 5.7.5: Understand that God uses His creation to teach people eternal truth through the study of science

Indicators:

5.7.5.1 Credit God with the wonder of life and the world around us

5.7.5.2 Identify examples of patterns and order in science that point to God as the creator