

## **Kindergarten Pages and Topics**

*Using my senses to understand my world*

In science, kindergarten students use their senses to make observations of the characteristics and interactions of objects in their world. Students study the characteristics of water and the basic needs of living things. They also study the relationship between the sun and Earth through shadows and weather. They determine how their actions can change the motion of objects and learn how they can make a difference in their world. Throughout the elementary years, students will develop scientific skills, supported by mathematics and computational thinking, as they learn science content. In kindergarten, students will develop skills in posing simple questions, conducting simple investigations, observing, classifying, and communicating information about the natural world.

### **Scientific and Engineering Practices - K.1**

See SOL

### **Earth and Space Science - K.8, K.9, K.10, K.11**

Sun and shadows

Light and temperature

Patterns in nature (daily weather, seasons, day and night)

Change occurs over time

Use of resources

Recycling and reusing resources

Choices we make impact the air, water, land and living things

### **Life Science - K.5, K.6, K.7**

Five senses

Living organisms and nonliving objects

Needs of plants and animals

Plant and animal life cycles

### **Physical Science - K.2, K.3, K.4**

Motion of objects

Physical properties

Introductory ideas about water

## **Grade One Pages and Topics**

*How I interact with my world*

In first-grade science, students become aware of factors that affect their daily lives. Students continue to learn about the basic needs of all living things and that living things respond to factors in their environment, including weather and the change of season. They continue the examination of matter by observing physical properties and how materials interact with light. Throughout the elementary years, students will develop scientific skills, supported by mathematics and computational thinking, as they learn science content. In first grade, students will develop skills in posing simple questions, conducting simple investigations, observing, classifying, and communicating information about the natural world. Students are introduced to the engineering design process.

### **Scientific and Engineering Practices - 1.1**

See SOL

### **Earth and Space Science - 1.6, 1.7, 1.8**

Relationship between sun and Earth

Sun as a source of energy and light

Sun's position in the sky

Weather and seasonal changes

How weather changes affect plants and animals

Natural resources - use and conservation

### **Life Science - 1.4, 1.5**

Plant needs, parts, and classification

Animal needs, physical characteristics, and classification

### **Physical Science - 1.2, 1.3**

Objects move in different ways

Objects may vibrate and produce sound

Objects are made from materials that can be described by their physical properties

## **Grade Two Pages and Topics**

*Change occurs all around us*

Science in second grade builds on previous understandings of forces, water, weather, and plants and animals, and students explore these concepts through the lens of change. They examine how water changes phase, how visible and invisible forces change motion, how plants and animals change through their life cycles, and how weather changes the Earth. Students also examine how change occurs over a short or long period of time. Throughout the elementary years, students will develop scientific skills, supported by mathematics and computational thinking, as they learn science content. In second grade, students will develop skills in posing simple questions, planning and conducting simple investigations, observing, classifying, and communicating information about the natural world. Students engage in more aspects of the engineering design process at this level.

### **Scientific and Engineering Practices - 2.1**

See SOL

### **Earth and Space Science - 2.6, 2.7, 2.8**

Weather

Seasonal changes

Plants as natural resources

Importance of plants and how they are used

### **Life Science - 2.4, 2.5**

Life cycles of plants and animals

How plants and animals interact with their surroundings

Habitats change over time

### **Physical Science - 2.2, 2.3**

Forces cause an object's motion to change

Gravity and magnetism can cause objects to move from a distance

How heating and cooling change matter

## **Grade Three Pages and Topics**

### *Interactions in our world*

The focus of science in third grade is interactions in our world. Students continue to study forces and matter by learning about simple machines and by examining the interactions of materials in water. They also look at how plants and animals, including humans, are constantly interacting with the living and nonliving aspects of the environment. This includes examining how adaptations satisfy life needs of plants and the importance of water, soil, and the sun in the survival of plants and animals. Throughout the elementary years, students will develop scientific skills, supported by mathematics and computational thinking, as they learn science content. In third grade, students will develop more sophisticated skills in posing questions and predicting outcomes, planning and conducting simple investigations, collecting and analyzing data, constructing explanations, and communicating information about the natural world. Students begin to use the engineering design process to apply their scientific knowledge to solve problems.

### **Scientific and Engineering Practices - 3.1**

See SOL

### **Earth and Space Science - 3.6, 3.7, 3.8**

Soil

Water cycle

Human impact on the environment

Water and soil as natural resources

Impact of fire, flood, disease, and erosion on ecosystems

### **Life Science - 3.4, 3.5**

Physical and behavioral adaptations

Fossils

Aquatic and terrestrial ecosystems

### **Physical Science - 3.2, 3.3**

Forces act on objects

Simple and compound machines

How materials interact with water

## **Grade Four Pages and Topics**

### *Our place in the solar system*

Our solar system is a grand place, and in fourth-grade science, students learn where we fit in this solar system. Starting with the solar system, and then moving to the planet Earth, the Commonwealth of Virginia, and finally their specific ecosystems, students examine how features of plants and animals support life. They also explore how living things interact with both living and nonliving components in their ecosystems. Throughout the elementary years, students will develop scientific skills, supported by mathematics and computational thinking, as they learn science content. In fourth grade, students will continue to develop skills in posing questions and predicting outcomes, planning and conducting simple investigations, collecting and analyzing data, constructing explanations, and communicating information about the natural world. Students continue to use the engineering design process to apply their scientific knowledge to solve problems.

### **Scientific and Engineering Practices - 4.1**

See SOL

### **Earth and Space Science - 4.4, 4.5, 4.6, 4.7, 4.8**

Weather

Planets

Relationships among the Earth, moon, and sun (motions, seasons, moon phases)

Oceans

Virginia natural resources

### **Life Science - 4.2, 4.3**

Structures of plants and animals for growth and reproduction

Photosynthesis

Food webs

Classification of organisms

***Note that there are no Physical Science Standards in Grade 4.***

## **Grade Five Pages and Topics**

### *Transforming matter and energy*

Grade five science delves more deeply into foundational concepts in physical science as students begin to make connections between energy and matter. Students explore how energy is transformed, and learn about electricity, sound, and light. They also learn about the composition of matter and explore how energy can change phases of matter. Students apply an understanding of force, matter, and energy when they explore how the Earth's surface changes. Students continue to develop scientific skills and processes as they pose questions and predict outcomes, plan and conduct investigations, collect and analyze data, construct explanations, and communicate information about the natural world. Mathematics and computational thinking gain importance as students advance in their scientific thinking. Students continue to use the engineering design process to apply their scientific knowledge to solve problems.

#### **Scientific and Engineering Practices - 5.1**

See SOL

#### **Earth and Space Science - 5.8, 5.9**

Changing Earth (plate tectonics, rock cycle, weathering, erosion, etc.)

Fossils and geologic patterns

Conservation of energy resources

Renewable and nonrenewable energy

#### **Physical Science - 5.2, 5.3, 5.4, 5.5, 5.6, 5.7**

Energy (definition, forms, transformation, conservation)

Energy of moving objects and friction

Current and static electricity

Electromagnetism

Sound

Light

Matter has properties and interactions

Atomic structure

Mixtures and solutions

Effect of energy on phases of matter

***Note that there are no Life Science Standards in Grade 5.***

## **Grade Six Pages and Topics**

*Our world; our responsibility*

In sixth grade, students are transitioning from elementary to middle school. The science standards support that transition as students examine more abstract concepts, providing a foundation in the disciplines of science. They explore the characteristics of their world, from the Earth's placement in the solar system to the interactions of water, energy, air, and ecosystems on the Earth. As students more closely examine the use of resources, they also consider how their actions and choices affect future habitability of Earth. Students continue to develop scientific skills and processes as they pose questions and predict outcomes, plan and conduct investigations, collect and analyze data, construct explanations, and communicate information about the natural world. Mathematics and computational thinking gain importance as students advance in their scientific thinking. Students continue to use the engineering design process to apply their scientific knowledge to solve problems.

### **Scientific and Engineering Practices - 6.1**

See SOL

### **Earth and Space Science - 6.2, 6.3, 6.7, 6.8, 6.9**

Solar system

Relationship between the sun, Earth, and the moon

Properties of the Earth's atmosphere

Watersheds

Human impact on the environment (natural resources, energy resources, public policy)

### **Physical Science - 6.4, 6.5, 6.6**

Sources of energy and transformations

Atomic structure of matter

Properties of water

***Note that there are no Life Science Standards in Grade 6.***