

# Science Curriculum

## Grade 1

The Fairfax County Elementary Science Program of Studies is a hands-on, inquiry based curriculum designed to provide students with a basic understanding of scientific investigation as it applies to the concepts of force, motion, and energy; matter; life processes; living systems; resources; Earth patterns, cycles, and change; interrelationships in Earth and space systems. Through science process skills and the practice of experimental design, students will develop abilities to solve problems, communicate, and make connections to science in our everyday world. The program materials include activity-centered units, science trade books, Windows on Science videodiscs, Fresh Science DVDs and specific web sites correlated to each science unit.



### SCI.G1

#### Standard 1

#### CONDUCT INVESTIGATIONS

The student will conduct investigations.



#### Benchmark 1.a

##### Use the Senses to Observe Differences in Physical Properties

The student will conduct investigations in which differences in physical properties are observed using the senses.



#### Indicator 1.a.1

##### Use senses to enhance observations of physical properties

Use senses to enhance observations of physical properties.



#### Benchmark 1.b

##### Use Simple Tools to Enhance Observations

The student will conduct investigations in which simple tools are used to enhance observations.



#### Indicator 1.b.1

##### Use simple tools to enhance observations of physical properties

Use simple tools, such as a magnifying glass, ruler, and thermometer, to enhance observations of physical properties.



#### Benchmark 1.c

##### Classify and Arrange Objects or Events According to Attributes

The student will conduct investigations in which objects or events are classified and arranged according to attributes or properties.



#### Indicator 1.c.1

##### Classify objects so that similarities and differences become apparent

Classify and arrange objects or events according to at least two attributes or properties so that similarities and differences become apparent.



#### Benchmark 1.d

##### Observations and Data are Communicated Both Orally and in Writing

The student will conduct investigations in which observations and data are communicated orally and with simple graphs, pictures, written statements, and numbers.

**Indicator 1.d.1****Communicate observations & data orally and with graphs, pictures, etc.**

Communicate observations made and data collected orally and with simple graphs, pictures, written statements, and numbers.

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**Benchmark 1.e****Measure Length, Mass and Volume Using Standard and Nonstandard Units**

The student will conduct investigations in which length, mass, and volume are measured using standard and nonstandard units.

**Indicator 1.e.1****Measure length, mass and volume using appropriate instruments & units**

Measure length, mass, and volume, using standard and nonstandard units and appropriate instruments. By the third grade, students will be expected to have basic facility with metric measures, including centimeters, grams, and liters.

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**Benchmark 1.f****Base Predictions on Patterns of Observations Rather than Guesses**

The student will conduct investigations in which predictions are based on patterns of observation rather than random guesses.

**Indicator 1.f.1****Predict outcomes based on observations & evidence rather than guesses**

Predict outcomes based on actual observations and evidence rather than random guesses.

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**Benchmark 1.g****Conduct Simple Experiments to Answer Questions**

The student will conduct investigations in which simple experiments are conducted to answer questions.

**Indicator 1.g.1****Answer questions by conducting simple experiments using simple tools**

Answer questions by conducting simple experiments/investigations, using simple tools, such as thermometer, ruler, or magnifying glass. A simple experiment is one that changes only one thing at a time (tests only one variable), gives quick results, and provides easily observable changes.

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**Benchmark 1.h****Make Inferences and Draw Conclusions About Familiar Objects and Events**

The student will conduct investigations in which inferences are made and conclusions are drawn about familiar objects and events.

**Indicator 1.h.1****Use familiar events & objects to make inferences and draw conclusions**

Use familiar events and objects to make inferences and draw conclusions.

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**SCI.G1****Standard 2****MOVING OBJECTS EXHIBIT DIFFERENT KINDS OF MOTION**

The student will investigate and understand that moving objects exhibit different kinds of motion.

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## **Benchmark 2.a**

### **Understand Objects May Have Straight, Circular, Back and Forth Motions**

The student will investigate and understand objects may have straight, circular, and back-and-forth motions.



#### **Indicator 2.a.1**

##### **Describe an object's motion as straight, circular, curved, etc.**

Describe and classify the motion of an object as straight, circular, curved, or back-and-forth.



#### **Indicator 2.a.2**

##### **Compare the movement of objects, using graphs, pictures, or numbers**

Compare the movement of objects, using graphs, pictures, and/or numbers.

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## **Benchmark 2.b**

### **Understand Objects May Vibrate and Produce Sound**

The student will investigate and understand objects may vibrate and produce sound.



#### **Indicator 2.b.1**

##### **Understand that vibrations may create sound**

Understand that vibrations may create sound, such as humming, strumming a guitar, or plucking a rubber band.

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## **Benchmark 2.c**

### **Understand Pushes or Pulls Can Change the Movement of an Object**

The student will investigate and understand pushes or pulls can change the movement of an object.



#### **Indicator 2.c.1**

##### **Understand that pushes or pulls can change the movement of an object**

Understand that pushes or pulls can change the movement of an object.



#### **Indicator 2.c.2**

##### **Predict an object's movement using its size, shape and force**

Predict an object's movement, using its size, shape, and the force of the push or pull on it.

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## **Benchmark 2.d**

### **Observe the Motion of Objects in Toys and Playground Activities**

The student will investigate and understand the motion of objects may be observed in the manipulation toys and in playground activities.



#### **Indicator 2.d.1**

##### **Make and communicate observations about moving objects**

Make and communicate observations about moving objects. Examples should include balls, objects with wheels, windup toys, tops, rubber bands, and playground equipment.



#### **Indicator 2.d.2**

##### **Conduct a simple experiment to determine an object's movement**

Conduct a simple experiment to determine an object's movement.



#### **Indicator 2.d.3**

##### **Record observations of movement using standard and nonstandard units**

Record observations of movement (length/distance), using standard (English/metric) and nonstandard units.



## SCI.G1

### Standard 3

#### UNDERSTAND HOW DIFFERENT COMMON MATERIALS INTERACT WITH WATER

The student will investigate and understand how different common materials interact with water.

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#### Benchmark 3.a

##### Understand that Some Liquids Separate When Mixed With Water

The student will investigate and understand that some liquids will separate when mixed with water, but others will not.



##### Indicator 3.a.1

###### Classify liquids as those that will dissolve in water or will not

Classify liquids into those that will dissolve in water and those that will not.



##### Indicator 3.a.3

###### Predict and describe how various materials act when mixed with water

Predict and describe how various materials (vinegar, milk, and oil) act when mixed with water.



##### Indicator 3.a.4

###### Observe and describe the various states of water: solid, liquid, gas

Observe and describe the various states of water: solid, liquid, gas (ice, water, vapor/steam).



##### Indicator 3.a.2

###### Display the information about dissolving liquids in water using graphs

Use picture graphs, tables, and/or charts to record and display the information about dissolving liquids in water.

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#### Benchmark 3.b

##### Understand that Some Common Solids Will Dissolve in Water

The student will investigate and understand that some common solids will dissolve in water, but others will not.



##### Indicator 3.b.1

###### Describe and apply the term dissolve

Describe and apply the term dissolve.



##### Indicator 3.b.2

###### Classify solids as those that will dissolve in water vs. will not

Classify solids into those that will dissolve in water and those that will not.



##### Indicator 3.b.4

###### Predict and describe how various materials act when mixed with water

Predict and describe how various materials (baking soda, powdered drink mix, sugar, salt, sand, soil, and rocks) act when mixed with water.



##### Indicator 3.b.3

###### Use picture graphs, tables, and/or charts to record & display results

Use picture graphs, tables, and/or charts to record and display the information about dissolving solids in water.

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#### Benchmark 3.c

## Understand that Some Substances Dissolve More Readily in Hot Water

The student will investigate and understand that some substances will dissolve more readily in hot water than in cold water.



### Indicator 3.c.1

#### Infer that some substances will dissolve more easily in hot water

Infer that some substances will dissolve more easily in hot water than in cold water by conducting investigations using water at different temperatures.



## SCI.G1

### Standard 4

#### PLANTS: LIFE NEEDS, FUNCTIONAL PARTS, AND CLASSIFICATION

The student will investigate and understand that that plants have life needs and functional parts and can be classified according to certain characteristics.



### Benchmark 4.a

#### Understand Plant Needs: Food, Air, Water, Light and a Place to Grow

The student will investigate and understand plant needs (food, air, water, light, and a place to grow).



### Indicator 4.a.1

#### Describe plant needs: food, air, water, light and a place to grow

Describe the needs of plants: food, air, water, light and a place to grow.



### Indicator 4.a.2

#### Conduct simple experiments/investigations related to plant needs

Conduct simple experiments/investigations related to plant needs by changing one variable (food, air, water, light, or place to grow) at a time. Students do not need to know the term variable.



### Benchmark 4.b

#### Investigate Plant Parts: Seeds, Roots, Stems, Leaves, Blossoms, Fruits

The student will investigate and understand plant parts (seeds, roots, stems, leaves, blossoms, fruits).



### Indicator 4.b.1

#### Create and interpret a model/drawing of a plant

Create and interpret a model/drawing of a plant, including seeds, roots, stems, leaves, blossoms, and fruits.



### Indicator 4.b.2

#### Identify the functions of the seed, root, stem and leaf

Identify the functions of the seed, root, stem, and leaf.



### Indicator 4.b.3

#### Describe methods by which seeds travel

*Describe methods by which seeds travel.*



### Indicator 4.b.4

#### Investigate and understand the life cycle of plants

*Investigate and understand the life cycle of plants.*



### Benchmark 4.c

### **Understand Plant Characteristics: Edible, Flowering, Evergreen, etc.**

The student will investigate and understand plant characteristics (edible/nonedible, flowering /nonflowering, evergreen/deciduous).



#### **Indicator 4.c.1**

##### **Describe plant characteristics: edible, flowering, evergreen, etc.**

Describe plant characteristics: edible/nonedible, flowering/nonflowering, evergreen/deciduous.



#### **Indicator 4.c.2**

##### **Classify the plant characteristics by using tables, charts and graphs**

Classify plants by the characteristics of edible/nonedible, flowering/nonflowering, and evergreen/deciduous, using tables, charts, and picture graphs.



## **SCI.G1**

### **Standard 5**

#### **ANIMALS: LIFE NEEDS, PHYSICAL CHARACTERISTICS, AND CLASSIFICATION**

The student will investigate and understand that animals, including people, have life needs and specific physical characteristics and can be classified according to certain characteristics.



#### **Benchmark 5.a**

##### **Understand the Life Needs of Animals (Air, Food, Water, Place to Live)**

The student will investigate and understand life needs (air, food, water, and a suitable place to live) of animals.



#### **Indicator 5.a.1**

##### **Describe the life needs of animals: air, food, water & a place to live**

Describe the life needs of animals, including air, food, water, and a suitable place to live.



#### **Indicator 5.a.2**

##### **Make and communicate observations of the needs & homes of live animals**

Make and communicate observations of live animals, including people, about their needs and where they live.



#### **Benchmark 5.b**

##### **Investigate Physical Characteristics of Animals**

The student will investigate and understand physical characteristics (body coverings, body shape, appendages, and methods of movement) of animals.



#### **Indicator 5.b.1**

##### **Make & communicate observations of physical characteristics of animals**

Make and communicate observations of live animals, including people, about their physical characteristics.



#### **Indicator 5.b.2**

##### **Identify and chart characteristics by which animals can be classified**

Identify and chart simple characteristics by which animals can be classified, including body coverings (hair, fur, feathers, scales, and shells), body shape, appendages (arms, legs, wings, fins, and tails), and methods of movement (walking, crawling, flying, and swimming).



#### **Benchmark 5.c**

##### **Understand Other Animal Characteristics (Wild/Tame, Water/Land Homes)**

The student will investigate and understand other characteristics (wild/tame, water homes/land homes) of animals.



#### **Indicator 5.c.1**

##### **Identify and chart characteristics by which animals can be classified**

Identify and chart simple characteristics by which animals can be classified, including wild or tame and water homes or land homes.



#### **Indicator 5.c.2**

##### **Distinguish between wild animals & tame animals and recognize examples**

Distinguish between wild animals (raccoon, hawk, squirrel, shark) and tame animals (dog, cat, sheep) and recognize examples of each.



#### **Indicator 5.c.3**

##### **Infer types of animal homes from the animal's physical characteristics**

Infer types of animal homes (water or land), using the physical characteristics of the animals, such as scales and fins that allow fish to live and move in water or fur and legs that allow dogs to live and move on land.



#### **Indicator 5.c.4**

##### **Classify animals by where they live (their homes)**

Classify animals by where they live (their homes).



## **SCI.G1**

### **Standard 6**

#### **BASIC RELATIONSHIPS BETWEEN THE SUN AND EARTH**

**The student will investigate and understand the basic relationships between the sun and Earth.**



#### **Benchmark 6.a**

##### **Understand that the Sun is the Source of Heat and Light for Earth**

The student will investigate and understand that the sun is the source of heat and light that warms the land, air, and water.



#### **Indicator 6.a.1**

##### **Infer that sunlight striking an object makes the object warmer**

Infer that sunlight striking an object makes the object warmer.



#### **Indicator 6.a.2**

##### **Conduct simple experiments to show how sunlight changes temperature**

Conduct simple experiments to show how sunlight changes the temperature of land, air, and water.



#### **Benchmark 6.b**

##### **Understand that Night and Day are Caused By the Rotation of the Earth**

The student will investigate and understand that night and day are caused by the rotation of the Earth.



#### **Indicator 6.b.1**

##### **Demonstrate and describe the concept of rotation**

Demonstrate and describe the concept of rotation.



#### **Indicator 6.b.2**

##### **Comprehend that day and night are caused by Earth's rotation**

Comprehend that day and night are caused by Earth's rotation.



#### **Indicator 6.b.3**

##### **Compare and contrast day and night by changes in temperature and light**

Compare and contrast day and night by characteristic changes in temperature and light.



**Indicator 6.b.4**

**Model the rotation of Earth and its physical relationship to the sun**

Model the rotation of Earth and its physical relationship to the sun.



**Indicator 6.b.5**

**Interpret the relationship between the sun's position and time of day**

Interpret the relationship between the sun's position in the sky and the general time of day. This includes the sun's relative position in the morning (East), at noon, and in the late afternoon (West).



**SCI.G1**

**Standard 7**

**RELATIONSHIP OF SEASONAL CHANGE AND WEATHER TO PLANTS AND ANIMALS**

The student will investigate and understand the relationship of seasonal change and weather to the activities and life processes of plants and animals.



**Benchmark 7.a**

**Understand How Temperature, Light and Precipitation Affect Plants**

The student will investigate and understand how temperature, light, and precipitation bring about changes in plants (growth, budding, falling leaves, and wilting).



**Indicator 7.a.1**

**Measure and chart changes in plants: budding, growth, wilting, etc.**

Measure and chart changes in plants, including budding, growth, wilting, and losing leaves. Recognize in what season budding and wilting will most likely occur.



**Indicator 7.a.2**

**Predict how an outdoor plant would change through the seasons**

Predict how an outdoor plant would change through the seasons.



**Indicator 7.a.3**

**Compare and contrast how common plants appear during summer and winter**

Compare and contrast how some common plants (e.g., oak trees, pine trees, and lawn grass) appear during summer and winter.



**Benchmark 7.b**

**Understand How Temperature, Light and Precipitation Affect Animals**

The student will investigate and understand how temperature, light, and precipitation bring about changes in animals (behaviors, hibernation, migration, body covering, and habitat).



**Indicator 7.b.1**

**Compare and contrast activities of some animals during summer & winter**

Compare and contrast the activities of some common animals (e.g., squirrels, chipmunks, butterflies, bees, ants, bats, and frogs) during summer and winter by describing changes in their behaviors and body covering.



**Indicator 7.b.2**

**Comprehend the concepts of hibernation, migration, and habitat**

Comprehend the concepts of hibernation, migration, and habitat, and describe how these relate to seasonal changes. (It may be useful to recognize common Virginia animals that hibernate and migrate, but specific names of animals is not the focus of student learning here.)



### **Benchmark 7.c**

#### **Understand How Temperature, Light and Precipitation Affect People**

The student will investigate and understand how temperature, light, and precipitation bring about changes in people (dress, recreation, and work).



#### **Indicator 7.c.1**

##### **Infer from people's dress and activities what the season is**

Infer from people's dress, recreational activities, and work activities what the season is.



### **Benchmark 7.d**

#### **Understand Seasonal Changes and Weather**

The student will investigate and understand seasonal changes and weather.



#### **Indicator 7.d.1**

##### **Identify precipitation types and temperature conditions**

Identify types of precipitation as rain, snow, and ice and the temperature conditions that result in each one.



#### **Indicator 7.d.2**

##### **Relate a temperature & precipitation chart to the corresponding season**

Relate a temperature and precipitation chart to the corresponding season (daily or weekly).



#### **Indicator 7.d.3**

##### **Compare and contrast the 4 seasons of spring, summer, fall and winter**

Compare and contrast the four seasons of spring, summer, fall (autumn) and winter in terms of temperature, light, and precipitation.



#### **Indicator 7.d.4**

##### **Observe and describe in general terms how a cloud is formed**

*Observe and describe in general terms how a cloud is formed.*



## **SCI.G1**

### **Standard 8**

#### **NATURAL RESOURCES ARE LIMITED**

**The student will investigate and understand natural resources are limited.**



### **Benchmark 8.a**

#### **Understand Identification of Natural Resources**

The student will investigate and understand identification of natural resources (plants and animals, water, air, land, minerals, forests, and soil).



#### **Indicator 8.a.1**

##### **Identify natural resources: plants, animals, water, air, land, etc.**

Identify natural resources such as plants and animals, water, air, land, minerals, forests, and soil.



#### **Indicator 8.a.2**

##### **Recognize that many natural resources are limited**

Recognize that many natural resources are limited.



#### **Indicator 8.a.3**

##### **Discuss the value of parks to wildlife and to people**

Discuss the value of parks to wildlife and to people.

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 **Benchmark 8.b**


**Understand Factors that Affect Air and Water Quality**

The student will investigate and understand factors that affect air and water quality.

 **Indicator 8.b.1**

**Classify factors that affect air and water quality**

Classify factors that affect air and water quality.

 **Indicator 8.b.2**

**Describe ways students & schools can help improve water & air quality**

Describe ways students and schools can help improve water and air quality in our communities.

 **Indicator 8.b.3**

**Investigate to determine some basic factors that affect water quality**

Determine some basic factors that affect water quality by conducting simple investigations in the school environment. Students should be able to make and record observations of what happens to run off water on rainy days. (Related to 1.3)

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 **Benchmark 8.c**


**Understand Recycling, Reusing and Reducing Consumption**

The student will investigate and understand recycling, reusing, and reducing consumption of natural resources.

 **Indicator 8.c.1**


**Compare and contrast ways of conserving resources**

Compare and contrast ways of conserving resources. This includes recycling, reusing, and reducing consumption of natural resources.

 **Indicator 8.c.2**

**Predict what would happen if natural resources were used up**

Predict what would happen if natural resources were used up.

 **Indicator 8.c.3**

**Explain ways to prevent natural resources from being used up**

Explain ways to prevent natural resources from being used up.