DINWIDDIE COUNTY Public Schools

2nd Grade

Science Curriculum

Dinwiddie County Public Schools provides each student the opportunity to become a productive citizen, engaging the entire community in the educational needs of our children.

Revised 8/7/16

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Science Curriculum

- The DCPS scope and sequence/pacing guide contains key topics that must be cross referenced with the VDOE enhanced scope and sequence and VDOE curriculum framework.

- All scientific investigations suggested in the Curriculum Framework under *Essential Knowledge, Skills, and Processes* should be included in science instruction. More information and resources can be found in the Enhanced Scope and Sequence found at the DOE link below.

DOE LINKS

Science Standards and SOL Based Resources

Performance Assessments

Performance assessments measure subject-matter proficiency and the ability of students to apply the content and skills they have learned. Performance assessments may also assess acquisition of the "Five C's" – critical thinking, creativity, communication, collaboration and citizenship – described in the Board of Education's Profile of a Virginia Graduate. Performance assessments are designed to encourage deeper learning and are an essential component of a balanced testing program.

The Virginia Department of Education – supported by a $1.1 million grant from the Hewlett Foundation – is developing resources and regional and statewide professional learning opportunities to help school divisions develop the capacity to design performance assessments and provide instruction that supports deeper learning.

Information about new resources and opportunities will be posted on the VDOE website as it becomes available.

- Performance Test Bank
- Local Alternate Assessments

Nine Weeks	Weeks Taught	Topic	Target SOL	Curriculum Framework
1	2	Scientific Investigation, Reasoning, Logic	2.1	1-5
1	7	Living Systems	2.5 2.1	16-18
2	3	Interrelationships Earth/Space Systems	2.6 2.1	19-21
2	3	Earth Patterns, Cycles, Changes	2.7 2.1	22-25
2	5	Matter	2.3 2.1	9-11
3	7	Earth's Resources	2.8 2.1	26-28
3-4	7	Living Processes	2.4 2.1	12-15
4	3	Force, Energy, Motion	2.2 2.1	6-8
4	2	Review material throughout the year	All SOLs	3-30

Dinwiddie County Public Schools Science Curriculum	
SOL 2.1 – 1st Nine Weeks / Ongoing Throughout the Year	**Prior Knowledge**
The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which a) observations and predictions are made and questions are formed; b) observations are differentiated from personal interpretation; c) observations are repeated to ensure accuracy; d) two or more characteristics or properties are used to classify items; e) length, volume, mass, and temperature are measured in metric units and standard English units using the proper tools; f) time is measured using the proper tools; g) conditions that influence a change are identified and inferences are made; h) data are collected and recorded, and bar graphs are constructed using numbered axes; i) data are analyzed, and unexpected or unusual quantitative data are recognized; j) conclusions are drawn; k) observations and data are communicated; l) simple physical models are designed and constructed to clarify explanations and show relationships; and m) current applications are used to reinforce science concepts.	

Understanding the Standard	Essential Knowledge, Skills, and Procedures
• Science demands evidence. Scientists develop their ideas based on evidence and they change their ideas when new evidence becomes available or the old evidence is viewed in a different way. • Science is a complex social endeavor. It is a complex social process for	• analyze sets of objects, numerical data, or pictures, and create basic categories to organize the data (descriptive or numerical). • judge which, if any, collected data in a small set appear to be unexpected or unusual.

producing knowledge about the natural world. Scientific knowledge represents the current consensus as to what is the best explanation for phenomena in the natural world. This consensus does not arise automatically, since scientists with different backgrounds from all over the world may interpret the same data differently. To build a consensus, scientists communicate their findings to other scientists and attempt to replicate one another's findings. In order to model the work of professional scientists, it is essential for second-grade students to engage in frequent discussions with peers about their understanding of their investigations. • In order to communicate accurately, it is necessary to provide a clear description of exactly what is observed. There is a difference between what one can observe and what can be interpreted from an observation. • An observation is what you actually see, feel, taste, hear, or smell. • The more times an observation is repeated, the greater the chance of ensuring the accuracy of the observation. • It is easier to see how things are related if objects are classified according to their common characteristics. • By constructing and studying simple models, it is sometimes easier to understand how real things work. • Scientific investigations require standard measures, proper tools (e.g., balance, thermometer, ruler, magnifying glasses), and organized collection and reporting of data. The way the data are displayed can make it easier to interpret important information. • When using any standard measurement scale, measure to the marked increment and estimate one more decimal place. Scientists do not round their measurements as this would be inaccurate. • Students should communicate observations and data publicly	• construct and interpret picture and bar graphs with numbered axes depicting the distribution of data. • communicate observations and data.

Vocabulary	Lessons and TEI Items	Trade Books
Observations- what you can see, hear, smell, taste, or feel	A Matter of Pattern Science Bob Experiments Science Experiments for Kids Reeko's Mad Scientist Lab Jefferson Lab – Teacher Resources	*Being a Scientist* (by Natalie Lunis and Nancy White) *Let's Experiment* (by Natalie Lunis and Nancy White) *Seven Blind Mice* (by Ed Young)

Additional Resources	
Interactive Notes Book Room Resources Library Resources Discovery Works Wonderville Teacher Tube Fossweb Scholastic Resources: BookFLIX, TrueFLIX, ScienceFLIX	National Science Digital Library Science Net Links Story Books Online Online Science Books National Geographic: Young Explorers Online Scholastic Study Jams BBC.co

Dinwiddie County Public Schools Science Curriculum	
SOL 2.5 – 1st Nine Weeks	**Prior Knowledge**
The student will investigate and understand that living things are part of a system. Key concepts include: a) living organisms are interdependent with their living and nonliving surroundings; b) an animal's habitat includes adequate food, water, shelter or cover, and space; c) habitats change over time due to many influences; and d) fossils provide information about living systems that were on Earth years ago.	**1.5** Animals need air, food, water, shelter, habitat. Students should already know: a) Animals have different physical characteristics. b) Classify animals by their characteristics.

Understanding the Standard	Essential Knowledge, Skills, and Procedures
• Living organisms are dependent on other living organisms and their nonliving surroundings for survival. • All of the interactions between and among living organisms and their nonliving surroundings are referred to as a system. • Shelter may be living (coral, tree) or nonliving (caves, houses). • The habitat of an animal includes adequate food, water, shelter or cover, and space. If any of the basic elements of an animal's habitat are absent, the animal's survival is threatened. The animal may adapt or leave the area. • The habitats of living organisms, such as forests, grasslands, rivers, and streams, change due to many human or natural influences (e.g., forest fires, hurricanes, and droughts). Habitats change from season to season.	**In order to meet this standard, it is expected that students will** • classify objects as to whether they are living or nonliving. • describe the basic components of an animal habitat (food, water, shelter or cover, and space). • classify the parts of an animal's habitat as living or nonliving. • construct and interpret simple models of different kinds of habitats, including a forest and a stream. • predict and describe seasonal changes in habitat and their effects on plants and animals, for example, how trees change through the seasons and how animals respond to changes in the seasons. • describe how animals are dependent on their surroundings, for example, how squirrels and other animals are affected by the loss of forest habitat.

• Fossils found provide scientists with information about plants and animals that lived on Earth many years ago. (e.g., The rise and fall of sea level is recorded in the richly fossiliferous rocks of Virginia's coastal plain. An abundance of marine fossils – fossil clams, snails, sand dollars, shark's teeth, and whalebones – can be found in Virginia's coastal plains.) • Virginia's state fossil, *Chesapecten jeffersonius*, is a large extinct species of scallop that dates to approximately 4.5 million years ago. It was the first fossil ever described in North America and is named after Thomas Jefferson, one of our founding fathers, and an amateur paleontologist.	• describe how scientists use the study of fossils to show past weather/climate conditions and environmental characteristics.

Vocabulary	Lessons and TEI Items	Trade Books
Shelter- a place or structure that gives protection against weather or danger **Habitat-** the place where a plant of animal naturally lives and grows. **Fossils-** any remains or imprint of living things of the past **Dependent-** relying on another for help for what one needs **Adapt-** to change for a particular use	There's no place like home - DOE Habitat changes over time – DOE Fossil Fun - DOE Investigating Local Ecosystems A Butterfly's Habitat Habitats Cross-Curricular Lessons Arthropod Cycles	*Who Lives in the Arctic* (by Susan Canizares) *Homes in the Ground (*by Mary Reid) *Who Lives Here* (by Dot and Sy Barlow) *Desert* (by Daniel Moreton) *Shelter* (by Susan Canizares) *Animals at Rest: Sleeping Patterns and Habitats* (author unknown)

Additional Resources	
Interactive Notes	National Science Digital Library
Book Room Resources	Science Net Links
Library Resources	The Franklin Institute for Science Learning
Discovery Works	Story Books Online
Wonderville	Online Science Books
Teacher Tube	National Geographic: Young Explorers Online
Fossweb	Scholastic Study Jams
BBC.co	Scholastic Resources: BookFLIX, TrueFLIX, ScienceFLIX

Dinwiddie County Public Schools Science Curriculum	
SOL 2.6 – 2nd Nine Weeks	**Prior Knowledge**
The student will investigate and understand basic types, changes, and patterns of weather. Key concepts include a) identification of common storms and other weather phenomena; b) the uses and importance of measuring, recording, and interpreting weather data; and c) the uses and importance of tracking weather data over time.	**1.7** a. Earth experiences changes in weather which affect life. b. Changes in temperature, light, precipitation can be observed and recorded over time.

Understanding the Standard	Essential Knowledge, Skills, and Procedures
• Earth's weather changes continuously from day to day. • Changes in the weather are characterized by daily differences in wind, temperature, and precipitation. • Precipitation occurs when water, previously evaporated, condenses out of the air and changes its phase from a gas to a liquid (rain) or to a solid (snow or sleet). • Extremes in the weather, such as too little or too much precipitation, can result in droughts or floods. • Storms have powerful winds, which may be accompanied by rain, snow, or other kinds of precipitation. • Weather data are collected and recorded using instruments. This information is very useful for predicting weather and determining weather patterns. • Weather influences human activity. • Scientists collect weather data over time to study trends and patterns.	**In order to meet this standard, it is expected that students will** • observe and describe seasonal weather patterns and local variations. • observe and record daily weather conditions, such as sunny, cloudy, windy, rainy, or snowy. • record and interpret daily temperature, using a graph with numbered axes. • measure and record weather data, using weather instruments, including a thermometer, rain gauge, and weather vane (standard English and metric measures). • describe weather in terms of temperature, wind, and precipitation. • observe and describe precipitation in terms of evaporation and condensation of water. • observe and describe types of precipitation, including rain, snow, and ice (sleet and hail). • describe how tracking weather data over time helps scientists make

These trends and patterns help them to make future weather predictions.	future weather predictions. • evaluate the influence of daily weather conditions on personal activities and dress. • identify common types of storms. Examples include hurricanes, tornadoes, blizzards, and thunderstorms. • compare and contrast droughts and floods.

Vocabulary	Lessons and TEI Items	Trade Books
Evaporation- the process in which water particles change from a liquid to a gas. **Precipitation-** water in the atmosphere that falls to Earth as rain, snow, hail, or sleet. **Sleet-** precipitation in the form of ice pellets created by the freezing of rain as it falls **Hail-** pellets made of ice and snow **Hurricane-** a very large, swirling storm with very low pressure at the center. **Tornado-** a violent whirling wind that moves across the ground in a narrow path. **Blizzard-** a heavy snowstorm that lasts for a long time. **Thunderstorm-** the most common severe storm, formed in cumulonimbus clouds.	Weather: Storms and Other Weather Phenomena Collecting Weather Data Weather Patterns and Seasons Temperature Weather For Kids Weather Maker Engineering Erosion Meteorologist Visit • NWS – Wakefield : Email Laura.Brummett@noaa.gov	*Lightning* (by Seymour Simon) *Danger! Earthquakes* (by Seymour Simon) *Weather Forecasting* (by Gail Gibbons) *What will the Weather Be?* (by Lynda DeWitt) *Earthquakes Weather* (by Carol Hosking) *Tornadoes* (by Seymour Simon) *Weather* (by Penelope Arlon) *What is Weather?* (by Ellen Lawrence) *Everything Weather* (by Kathy Furgang) *Wild Weather: Floods!* (by Lorraine Jean Hopping)

Drought- a long period of time with little or no precipitation.		

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Dinwiddie County Public Schools Science Curriculum	
SOL 2.7 – 2nd Nine Weeks	**Prior Knowledge**
The student will investigate and understand that weather and seasonal changes affect plants, animals, and their surroundings. Key concepts include a) effects of weather and seasonal changes on the growth and behavior of living things; and b) weathering and erosion of land surfaces.	**1.7** Changes in weather affect plants and animals.

Understanding the Standard	Essential Knowledge, Skills, and Procedures
• Living organisms respond to weather and seasonal changes. This can be reflected in changes in growth and behavior. • Adverse conditions of weather may slow the growth and development of plants and animals, whereas optimal weather conditions may accelerate the growth and development of plants and animals. • Dormancy is a state of reduced metabolic activity adopted by many organisms (both plants and animals) under conditions of environmental stress or when such stressful conditions are likely to appear, such as in winter. • Many trees produce new leaves in the spring and lose them in the fall due to seasonal changes in temperature and light. • The outward coloration and coloration patterns of many animals are similar in appearance to the plants in the places in which they live. This similarity to background is referred to as camouflage, and it enables animals to hide and avoid those that may eat or harm them. • Some animals (e.g., geese, monarch butterflies, tundra swans) travel from one place to another and back again (migration) in search of a new	**In order to meet this standard, it is expected that students will** • identify growth and behavioral responses of plants and animals to weather and seasonal changes. Examples of responses that are adaptive include migration, hibernation, camouflage, and dormancy. • identify animals that migrate, hibernate, or show other changes throughout the seasons or in the presence of adverse environmental conditions. • evaluate the usefulness of camouflage in an animal's habitat (for example, coloration patterns of frogs). • compare and contrast the responses of plants and animals to weather and seasonal changes. • model the effects of weathering and erosion on the land surface.

temporary habitat because of climate, availability of food, season of the year, or reproduction. • Some animals (e.g., groundhogs, black bears) go into a deep sleep (hibernation) due to seasonal changes. Hibernation is a condition of biological rest or inactivity where growth, development, and metabolic processes slow down. • Some animals undergo physical changes (e.g., thickening of dog fur in the winter and shedding in the summer) from season to season. • Land surfaces are subject to the agents of weathering and erosion. Land surfaces that are not covered with or protected by plants are more likely to be subject to the loss of soil by wind and water. • Weathering is the breaking down of rocks, which usually happens over long periods of time. • Erosion is the process by which the products of weathering are moved from one place to another. Erosion may happen quickly (e.g., during a flood or a hurricane) or over a long period of time.	

Vocabulary	Lessons and TEI Items	Trade Books
Adapt- to change for a particular use **Camouflage-** a way of hiding something by covering or coloring it so that it looks like its surroundings **Dormancy-** state of rest or sleep **Erosion-** the picking up and carrying away of pieces of rock.	What changes when the seasons changes? - DOE Erosion Simulation - DOE Erosion Interactive Seasons Model Hurricanes and their Effects on Life	*On the Move: Mass Migrations* (by Scotti Cohn) *Stripes of All Types* (by Susan Stockdale) *Going Home: The Mystery of Animal Migration* (by Marianne Berkes) *Great Migrations* (by Elizabeth Carney) *How do Animals Adapt?* (by Bobbie Kalman)

Hibernate- to sleep through the winter in a den or burrow to save energy **Migrate-** to move from one region into another **Weathering-** breaking down rocks into smaller pieces	Arthropod Cycles Engineering Erosion Appomattox Soil and Water • Sara Cravath will come to do lessons for erosion – sara.cravath@vaaswcd.org 469-7297 ext. 101	*Do Not Disturb: The Mysteries of Animal Hibernation and Sleep* (by Margery Facklam)

Additional Resources	
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Dinwiddie County Public Schools Science Curriculum	
SOL 2.3 – 2nd Nine Weeks	**Prior Knowledge**
The student will investigate and understand basic properties of solids, liquids, and gases. Key concepts include a) identification of distinguishing characteristics of solids, liquids, and gases; b) measurement of the mass and volume of solids and liquids; and c) changes in phases of matter with the addition or removal of energy.	**1.3** • Liquids can separate when mixed. • Solids can dissolve in some liquids. • Some substances dissolve more easily in hot water.

Understanding the Standard	Essential Knowledge, Skills, and Procedures
• All substances are made of matter. • Matter is anything that has mass and takes up space. • Solids have a defined shape and volume. • Liquids have a definite volume and take the shape of the container. • Gases will completely fill any closed container (take the shape of its container) and assume the volume of its container. (e.g., Helium gas put into a balloon takes the shape of the balloon because the balloon defines its shape.) • Mass is a measure of the amount of matter. • Weight is the measure of the gravitational pull on an object. • Volume is the measure of the amount of space occupied by matter. • Matter most commonly occurs in three phases: solids, liquids, and gases. • Matter can change from one phase to another.	**In order to meet this standard, it is expected that students will** • classify materials as to whether they are liquids, solids, or gases. • describe and identify examples of condensation, evaporation, melting, and freezing of water. • measure the mass of solids and the volume of liquids in metric and standard English units. • examine and describe the transformation of matter from one phase to another, i.e., solid water (ice) to liquid (water) to gas (water vapor). • conduct an investigation to observe the condensation of water. • design and conduct an investigation to determine basic factors that affect the evaporation of water. • identify the phases of water and the uses of water in its various phases in the home and at school.

• When matter changes from one phase to another, these changes are referred to as physical changes. • Changes from solid to liquid to gas require the addition of energy.	

Vocabulary	Lessons and TEI Items	Trade Books
Matter- anything that has mass and takes up space. **Liquids-** a state of matter that takes up a definite amount of space but has no definite shape. **Solids-** a state of matter that has a definite shape and takes up a definite amount of space. **Gases-** a state of matter that does take up a definite amount of space and has no definite shape. **phases of matter-** solid, liquid, gas **Condensation-** the process in which water particles change from a gas to liquid. **Evaporation-** the process in which water particles change from a liquid to a gas. **Melting-** when water particles absorb heat energy and change from a solid to a liquid. **Freezing-** the process in which moving particles in water slow down, loose heat, and change from a liquid to a solid.	What makes a solid a solid? - DOE Let's find the mass and volume - DOE The Water Cycle - DOE States of water Evaporation and Condensation Condensation Applying Energy Engineering Erosion Matter Heats Up Matter – Solid, Liquid, Gas	*What is the World Made Of?(* by Kathleen Zoehfeld) *What is Everything Made Of?* (Macmillan) *Solid, Liquid, or Gas?* (by Sally Hewitt) *Matter: See it, Touch it, Taste it, Smell it* (by Darlene Stille)

Mass- the amount of matter making up an object. **Volume-** the amount of space an object takes up.		

Additional Resources	
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Book Room Resources	Science Net Links
Library Resources	The Franklin Institute for Science Learning
Discovery Works	Story Books Online
Wonderville	Online Science Books
Teacher Tube	National Geographic: Young Explorers Online
Fossweb	Scholastic Study Jams
BBC.co	Scholastic Resources: BookFLIX, TrueFLIX, ScienceFLIX

Dinwiddie County Public Schools Science Curriculum	
SOL 2.8 –3rd Nine Weeks	**Prior Knowledge**
The student will investigate and understand that plants produce oxygen and food, are a source of useful products, and provide benefits in nature. Key concepts include a) important plant products are identified and classified; b) the availability of plant products affects the development of a geographic area; c) plants provide oxygen, homes, and food for many animals; and d) plants can help reduce erosion.	**1.8** • There are factors which affect air and water quality. • Recycling, reducing, and reusing resources helps save natural materials.

Understanding the Standard	Essential Knowledge, Skills, and Procedures
• Plants provide many useful products and materials, which benefit human beings as well as other living organisms. • Plant products include such essentials as oxygen and food, as well as materials useful for clothing and shelter. • Plants may grow well in certain geographic areas, thus enabling the production of plant products that allow humans to live in and thrive in those areas. • Some examples of plants that grow in Virginia's geographic regions include: - Coastal Plains (Tidewater): peanuts, cotton, soybeans; - Piedmont: apples, tobacco, cabbage; - Blue Ridge Mountains: evergreens, apples, corn; - Valleys and Ridges: evergreens, apples, corn; and - Appalachian Plateau: tobacco. • Plants provide homes and food sources for many animals.	**In order to meet this standard, it is expected that students will** • understand that plants produce oxygen and food. • classify and identify the sources and uses of plant products, such as fiber, cotton, oil, spices, lumber, rubber, medicines, and paper. • describe how the availability of certain plant products in a geographic area would affect the development of that area. • describe plant products grown in Virginia that are useful to people, including wood, fruits, and vegetables. List and classify plant products (e.g., peanuts, cotton, soybeans, apples, evergreens). • compare and contrast different ways animals use plants as homes and shelters. • construct and interpret a chart illustrating the plant foods consumed by different animals.

• Plants are important in the prevention of soil erosion. • Products from plants include, but are not limited to, cinnamon from the bark of trees; fiber from reeds, grasses and trees; cotton from a cotton plant; spices from various plant parts; lumber from wood; rubber from rubber trees; and medicines (e.g., aloe vera from the aloe plant, quinine from the bark of Cinchona trees found in South America to treat malaria).	• construct and interpret a model that demonstrates how plants reduce soil erosion.

Vocabulary	Lessons and TEI Items	Trade Books
Oxygen- a gas with no color or smell **Fiber-** a small, thin part of a plant, animal, or mineral that is shaped like a thread. **Rubber-** a stretchy substance made from the dried sap or liquid from certain tropical plants	We need plants! - DOE Plant Products Review Earth's Resources Where is Wood? How Bamboo Are You? Appomattox Soil and Water • Sara Cravath will come do a lesson on plants sara.cravath@vaawscd.org 469-7297 ext. 101	*Franklin Plants a Tree* (by Paulette Bourgeois) *From Plant to Blue Jeans* (by Arthur John L'Hommedieu) *Be a Friend to Trees* (by Patricia Lauber)

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Library Resources	The Franklin Institute for Science Learning
Discovery Works	Story Books Online
Wonderville	Online Science Books
Teacher Tube	National Geographic: Young Explorers Online
Fossweb	Scholastic Study Jams
BBC.co	Agricultural Map of Virginia
	Scholastic Resources: BookFLIX, TrueFLIX, ScienceFLIX

Dinwiddie County Public Schools Science Curriculum	
SOL 2.4 – 3rd/4th Nine Weeks	**Prior Knowledge**
The student will investigate and understand that plants and animals undergo a series of orderly changes as they mature and grow. Key concepts include a) animal life cycles; and b) plant life cycles.	**1.4** • Plants need air, water, light, and places to live. • Plants have different basic parts. • Classify plant parts and their characteristics.

Understanding the Standard	Essential Knowledge, Skills, and Procedures
• Throughout their lives, plants and animals undergo a series of orderly and identifiable changes. • Changes in organisms over time occur in cycles and differ among the various plants and animals. • Some animals, such as mealworms, pill bugs, frogs, and butterflies go through distinct stages as they mature to adults. Other animals, such as crickets, praying mantises, gray squirrels, and white-tailed deer, resemble their parents from birth to maturity and do not have distinct stages. • White-tailed deer are the largest herbivores in Virginia. They are found in all areas of Virginia including forests, open fields, mountain tops, coastal islands, and in cities and towns. Their diet consists of grasses, leaves, nuts, fruits, and fungi. Virginia's white-tailed deer have few predators. Fawns may be taken by bobcat. Other mortality factors include hunting, motor vehicles, poaching, and trains. • Newborn white-tailed deer are called fawns. They become yearlings at 14 to 18 months of age. As adults, males are called bucks and females are called does. White-tailed deer are tan or reddish brown in the summer and grayish brown in the winter. The underside and throat are white, and the tail is brown above and white below.	**In order to meet this standard, it is expected that students will** • describe changes in the life cycles of a butterfly and a white-tailed deer. • compare and contrast life cycles of a butterfly and a white-tailed deer. • identify the stages in the life cycle of a flowering plant. • construct and interpret models/diagrams of animal and plant life cycles.

• A white-tailed deer's lifespan averages eight years. • Of the more than 200,000 kinds of vascular plants in the world today over 95 percent flower at some time in their lives. The best-known flowers are bright and colorful but others, like those of grasses, are small and inconspicuous. • The basic stages in the life cycle of flowering plants include: seeds, germination of the seed, growth of the stem and roots, growth of leaves, growth of flowers, fertilization (pollination) of the flowers, production of fruit/new seeds, and death.	

Vocabulary	Lessons and TEI Items	Trade Books
Lifecycle- the stages of growth and change in an organisms life. **White-tailed deer-** largest herbivore in Virginia found in all regions of the state.	Looking at Life Cycles - DOE Life of a Butterfly Life Cycle of a White Tail Deer What Will I be When I Grow Up? Arthropod Cycles How Bamboo Are You?	*Science Life Cycles Series* (Creative Teaching Press) *Butterflies!* (by Darlene Freeman) *Butterfly Eggs* (by Helen Frost) *Frogs* (by Gail Gibbons) *Are You a Butterfly* (by Judy Allen and Tudor Humphries) *White-Tailed Deer* (by Joan Kalbacken) *Waiting for Wings* (by Lois Ehlert)

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Dinwiddie County Public Schools Science Curriculum	
SOL 2.2 – 4th Nine Weeks	**Prior Knowledge**
The student will investigate and understand that natural and artificial magnets have certain characteristics and attract specific types of metals. Key concepts include a) magnetism, iron, magnetic/nonmagnetic, poles, attract/repel; and b) important applications of magnetism.	**K.3** a. Magnetism has effects on some materials. b. Magnets have different uses

Understanding the Standard	Essential Knowledge, Skills, and Procedures
• Magnets have a north and a south pole. • Unlike magnetic poles attract and like poles repel. The north pole of one magnet attracts the south pole of a second magnet, while the north pole of one magnet repels the other magnet's north pole. • A magnet creates an invisible area of magnetism all around it called a magnetic field. • The north end of a magnetic compass always points roughly toward Earth's North Pole and the south end of the compass needle always points toward Earth's South Pole. That is because Earth itself contains magnetic materials and behaves like a gigantic magnet. • When a magnetized metal, such as a compass needle, is allowed to swing freely, it displays the interesting property of aligning with Earth's magnetic fields. • A magnet is strongest at its poles.	**In order to meet this standard, it is expected that students will** • identify the north and south magnetic poles of magnets. • use magnetic compasses to determine the directions of north and south poles. • predict which materials will be attracted to magnets, test the predictions, and create a chart that shows the results, classifying materials as to whether they are attracted to magnets or not. • conduct an investigation to determine how the different poles of magnets react to the poles of other magnets. • identify important applications of magnets in everyday life: - refrigerator magnets and chalkboard letters - toys - door latches - paper clip holders - computers - motors

• The farther away the magnetic poles are from each other, the weaker the magnetic force. • If you cut a bar magnet in half, you get two new, smaller magnets, each with its own north and south pole. • Magnets can attract objects made of iron, nickel, or cobalt. • Magnets can be artificially made from special metals or can occur naturally. Naturally occurring magnets are composed of a mineral called magnetite or lodestone. • Magnets have important applications and uses in everyday life.	- credit card magnetic strips. • compare natural magnets (lodestone or magnetite) and artificial magnets. • create a new application for using a magnet.

Vocabulary	Lessons and TEI Items	Trade Books
North pole- north end of a magnetic compass always points roughly toward Earth's North Pole **South pole-** the south end of the compass needle always points toward Earth's South Pole **magnetic compass-** an instrument that shows direction relative to the earth's magnetic field **attract-** opposite poles come together **repel-** when two north's or two south's resist each other when put together.	Magnets and Magnetism - DOE What do Magnets Pick Up? Making needle magnets Pointing North	*Marta's Magnets* (by Wendy Pfeffer) *Magnets* (by Anne Schrieber) *Magnetism* (by Peter D. Riley)

magnetic field- the space around a magnet in which a magnetic force is active **natural magnets-** made of minerals magnetite or lodestone **lodestone-** a rock that acts as a magnet and attracts iron **iron -** a heavy gray metal that is one of the chemical elements. Iron rusts easily and can be magnetized **nickel-** a dense, hard, silver-white metal **cobalt-** a brittle silver-white metal		

Additional Resources	
Interactive Notes	National Science Digital Library
Book Room Resources	McGraw-Hill Interactives
Library Resources	Virginia Department of Inland Fisheries
Discovery Works	Science Net Links
Wonderville	The Franklin Institute for Science Learning
Teacher Tube	Story Books Online

Fossweb BBC.co Scholastic Resources: BookFLIX, TrueFLIX, ScienceFLIX	Online Science Books National Geographic: Young Explorers Online Scholastic Study Jams