

New standards are to be introduced, and are subject to benchmark testing and SOL field testing in 2011-2012. Old standards are to be taught to mastery in 2011-2012. Full implementation of new standards in 2012-2013.

Amherst County Public Schools Grade 4 Science Pacing Guide Revised 2010	
Nine Weeks 1	
4.1 a Duration: Throughout the instruction of SOL 4.2 and 4.3	The student will <u>demonstrate an understanding of scientific reasoning, logic and the nature of science by planning</u> and conducting investigations in which <ul style="list-style-type: none"> a) distinctions are made among observations, conclusions, inferences, and predictions. *Use content from SOL 4.2 and 4.3
4.1 i, e Duration: Throughout the instruction of SOL 4.2 as appropriate	The student will demonstrate an understanding of scientific reasoning, logic and the nature of science by planning and conducting investigations in which <ul style="list-style-type: none"> i) data are <u>collected, recorded, analyzed</u>, and displayed using bar and basic line graphs; e) predictions <u>and inferences</u> are made, and <u>conclusions are drawn from a variety of sources.</u> *Use content from SOL 4.2
4.1 h, g, Duration: Throughout the instruction of SOL 4.3 as appropriate	The student will demonstrate an understanding of scientific reasoning, logic and the nature of science by planning and conducting investigations in which <ul style="list-style-type: none"> h) hypotheses are <u>developed</u> as cause and effect relationships g) constants in an experimental situation are identified; *Use content from SOL 4.3
4.2 Duration: 12 days	The student will investigate and understand characteristics and interaction of moving objects. Key concepts include <ul style="list-style-type: none"> a) motion is described by an object's direction and speed; b) changes in motion are related to force and mass; c) friction is a force that opposes motion; and d) moving objects have kinetic energy.
4.3 Duration: 25 days	The student will investigate and understand the characteristics of electricity. Key concepts include <ul style="list-style-type: none"> a) conductors and insulators; b) basic circuits (open/closed, parallel/series); c) static electricity; d) the ability of electrical energy to be transformed into light <u>and motion, and to produce heat</u>; e) simple electromagnets and magnetism; and f) historical contributions in understanding electricity.

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Nine Weeks 2	
4.1 a, h, b Duration: Throughout the instruction of SOL 4.7 and 4.8 as appropriate	The student will <u>demonstrate an understanding of scientific reasoning, logic and the nature of science by planning</u> and conducting investigations in which <ul style="list-style-type: none"> a) distinctions are made among observations, conclusions, inferences, and predictions; h) hypotheses are <u>developed as</u> cause and effect relationships; and b) <u>objects or events are classified and arranged according to characteristics or properties.</u> *Use content from SOL 4.7 and 4.8
4.7 NEW Duration: 10 days	<u>The student will investigate and understand the organization of the solar system. Key concepts include</u> <ul style="list-style-type: none"> a) <u>the planets in the solar system;</u> b) <u>the order of the planets in the solar system; and</u> c) <u>the relative sizes of the planets.</u>
4.8 Duration: 10 days	The student will investigate and understand the relationships among the Earth, moon, and sun. Key concepts include <ul style="list-style-type: none"> a) the motions of the Earth, moon, and sun (revolution and rotation) b) the causes for the Earth's seasons; c) <u>the causes for the phases of the moon;</u> d) the relative size, position, age, and makeup of the Earth, moon, and sun; and e) historical contributions in understanding the Earth-moon-sun system.
4.9 Duration: 20 days	The student will investigate and understand important Virginia natural resources. Key concepts include <ul style="list-style-type: none"> a) watersheds and water resources; b) animals and plants; c) minerals, rocks, ores, and energy sources; and d) forests, soil, and land.

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Nine Weeks 3	
<p>4.1 c, a, h</p> <p>Duration: Throughout the instruction of SOL 4.6 as appropriate</p>	<p>The student will <u>demonstrate an understanding of scientific reasoning, logic and the nature of science by planning</u> and conducting investigations in which</p> <ul style="list-style-type: none"> c) appropriate instruments are selected <u>and used</u> to measure length, mass, volume, and temperature <u>in metric units;</u> a) distinctions are made among observations, conclusions, inferences, and predictions; and i) hypotheses are <u>developed</u> as cause and effect relationships. <p>*Use content from SOL 4.6</p>
<p>4.6</p> <p>Duration: 40 days</p>	<p>The student will investigate and understand how weather conditions and phenomena occur and can be predicted. Key concepts include</p> <ul style="list-style-type: none"> a) weather phenomena (fronts, clouds, and storms); b) weather measurements and meteorological tools (air pressure/barometer, wind speed/anemometer, rainfall/rain gauge, and temperature/thermometer); c) <u>use of weather measurements and weather phenomena to make weather predictions.</u>
Nine Weeks 4	
<p>4.1 c, d, f, i, j, k, l, m</p> <p>Duration: Throughout the instruction of SOL 4.4 as appropriate</p>	<p>The student will <u>demonstrate an understanding of scientific reasoning, logic and the nature of science by planning</u> and conducting investigations in which</p> <ul style="list-style-type: none"> c) appropriate instruments are selected <u>and used</u> to measure length, mass, volume, and temperature <u>in metric units;</u> d) <u>appropriate instruments are selected and used to measure elapsed time;</u> f) <u>independent and dependent variables are identified;</u> j) data are <u>collected, recorded, analyzed,</u> and displayed using bar and basic line graphs; k) numerical data that are contradictory or unusual in experimental results are recognized; l) <u>data are communicated with simple graphs, pictures, written statements, and numbers;</u> m) <u>models are constructed to clarify explanations, demonstrate relationships, and solve needs; and</u> n) <u>current applications are used to reinforce science concepts.</u> <p>*Use the content from SOL 4.4</p>

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<p>4.4</p> <p>Duration: 16 days</p>	<p>The student will investigate and understand basic plant anatomy and life processes. Key concepts include</p> <ul style="list-style-type: none">a) the structures of typical plants and the function of each structure (leaves, stems, roots, and flowers);b) processes and structures involved with plant reproduction (pollination, stamen, pistil, sepal, embryo, spore, and seed);c) photosynthesis (sunlight, chlorophyll, water, carbon dioxide, oxygen, and sugar); andd) <u>adaptations allow plants to satisfy life needs and respond to the environment;</u> <p>Old d) dormancy</p>
<p>4.5</p> <p>Duration: 24 days</p>	<p>The student will investigate and understand how plants and animals, <u>including humans</u>, in an ecosystem interact with one another and with the nonliving components in the ecosystem. Key concepts include</p> <ul style="list-style-type: none">a) plant and animal adaptations (behavioral and structural adaptations);b) organization of <u>populations</u>, communities, and <u>ecosystems and how they interrelate;</u>c) flow of energy through food webs;d) habitats and niches;e) <u>changes in an organism's niche at various stages in its life cycle; and</u>f) influence of human activity on ecosystems.