6th grade Life Science Pacing Guide **Curriculum Framework: Life Science**
Lynchburg City Schools 2013-2014 **Curriculum Framework: Grade 6**

1ST 9 WEEKS (8/26-10/25)

SOL	Enabling Objective: Description	Text	Recommended Activities (e.g., applets, ESS, labs)	# days to teach
	Begin gathering data the 1st day of school!	***DO NOT FEEL BOUND TO THE TEXT BOOK! .....*** *PLEASE USE* ***ONLINE RESOURCES, APPLETS, & HANDS-ON ACTIVITIES***		***44 days***
	During the 1st week of school give a PRE-TEST(for growth measurement for Teacher Evaluation & School Improvement—1 day short test of essential skills)			
6.1 a-j (6.1 and LS obj. Are Similar and can go hand and hand to enhance each other.)	*Orientation to Middle School/Rules and Procedures; Lab Safety; Setup of Interactive Notebooks, Science Response Logs/Journals* **Science Investigation & Measurement** ***The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which*** a) Observation are made involving fine discrimination between similar objects and organisms b) precise and approximate measurements are recorded c) scale models are used to estimate distance, volume, and quantity d) hypotheses are stated in ways that identify the independent and dependent variables e) a method is devised to test the validity of predictions and inferences f) one variable is manipulated over time, using many repeated trials; g) data are collected, recorded, analyzed, and reported using metric measurements and tools	Life Science Text: Chapter 1 Sections 1-3	* *There should be a strong emphasis on metric measurement, the scientific process, interpreting and creating graphs, and collecting and analyzing data using the scientific tools mentioned.* Scientific Inquiry Interpreting and creating graphs Scientific Method video Create a graph Simpsons worksheet- parts of an experiment SpongeBob worksheet- parts of an experiment Virtual Lab Scientific Method Triple Beam Balance Worksheet Predicting Mass Measurement Controlled Experiment Scientific Theory Making Predictions Scientific Method Collecting Data Resources are the same as above since 6.1 and LS.1	5 days 20 days

	h) data are analyzed and communicated through graphical representation; i) models and simulations are designed and used to illustrate and explain phenomena and systems; and j) current applications are used to reinforce science concepts.		are comparable and go hand in hand	
LS.1 c,e, g, i	***The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which*** c) triple beam and electronic balances, thermometers, metric rulers, graduated cylinders, and probe-ware are used to gather data; e) sources of experimental error are identified; g) variables are controlled to test hypotheses and trials are repeated; i) patterns are identified in data and are interpreted and evaluated; (see next page)			
	Weather & Measurement			
6.6 b-f	***The student will investigate and understand the properties of air and the structure and dynamics*** **of the Earth's atmosphere. Key concepts include** b) air pressure, temperature, and humidity; c) how the atmosphere changes with altitude d) natural and human caused changes to the atmosphere and the importance of protecting and maintain air quality e) the relationship of atmospheric measures and weather conditions f) basic information from weather maps including fronts, systems, and basic measurements		Weather Weather and climate Weather Instruments Relative Humidity Air Masses & Fronts Weather Dude Barometer Reading Weather Maps Interactive Weather Map Clouds and Precipitation Weather Instruments Earth's Atmosphere Air Pressure and Wind Weather and climate Atmospheric level interactive What is in each Atmospheric level Atmospheric Influences (Adv)	
6.5 d	**The student will investigate and understand the unique properties and characteristics of water and its roles in the natural and human-made environment. Key concepts include**			

	d) the ability of large bodies of water to store heat and moderate climate		Atmosphere and Weather Interactive Atmosphere Movie and Informational pieces, graphs Climate Change- EPA Climate Change Slide Show	
LS.5a-c LS. 8a-e LS.6 d	****Review Characteristics and Needs of Living Things prior to beginning this unit.* **Photosynthesis** ***The student will investigate and understand the basic physical and chemical processes of photosynthesis and its importance to plant and animal life. Key concepts include*** a) energy transfer between sunlight and chlorophyll; b) transformation of water and carbon dioxide into sugar and oxygen c) photosynthesis as the foundation of virtually all food webs **Food Chains & Food Webs** ***The student will investigate and understand interactions among populations in a biological community. Key concepts include*** a) the relationships among producers, consumers, and decomposers in food webs; b) the relationship between predators and prey; c) competition and cooperation; d) symbiotic relationships; and e) niches. ***Energy Flow*** ***The student will investigate and understand that organisms within an ecosystem are dependent on one another and on nonliving components of the environment. Key concepts***	Life Science Text: Chapter 2 Section 1-3 Life Science Text: Chapter 18 Sections 1-3	Life Processes Illuminating Photosynthesis Photosynthesis Leaf Photosynthesis Food Chains Food Webs Types of Symbiosis Decomposer video Predator/Prey Food Chain and Web Games Create a Leveled Web Investigating Ecosystem Worksheet Ecosystem food web interactive Antarctica food web Energy Flow Video Food Web Video Food Chain and Web Games Create a Leveled Web	15 days

	include d) energy flow in food webs and energy pyramids			
	FLEX days & REMEDIATION			4 days

Reflection Notes:

2ND 9 WEEKS (10/29-1/17)

SOL	Enabling Objective: Description	Text	Recommended Activities (e.g., applets, ESS, labs)	# days to teach
				45 days
LS.9 a-c	**Ecosystems** ***The student will investigate and understand how organisms adapt to biotic and abiotic factors in an ecosystem. Key concepts include*** a) differences between ecosystems and biomes b) characteristics of land, marine, and freshwater ecosystems c) adaptations that enable organisms to survive within a specific ecosystem	Life Science Text: Chapter 20 Sections 1-3	Biomes Ecosystem video Desert Ecosystems Biome Map 3-D Biomes Make a Panda Habitat Enchanted Learning Biomes Biome Labs, Activities, and other Resources Build a Prairie Build a Reef Movie Biome/Animal Resource Site	20 days
6.7 a-g	***Water Sheds*** ***The student will investigate and understand the natural processes and human interactions that affect watershed systems. Key concepts include*** a) the health of ecosystems and the abiotic factors of a watershed b) the location and structure of Virginia's regional watershed systems; c) divides, tributaries, river systems, and river and stream processes; d) wetlands; e) estuaries;		Virginia Water Shed with PDF Aquatic Ecosystems Water Shed SOL Pass River System PDF Note Page Build a Pond Sail Around the Chesapeake Bay Estuary Education	

LS. 6 c 6.5 c,e- f	f) major conservation, health, and safety issues associated with watersheds; and g) water monitoring and analysis using field equipment including hand-held technology. ***The student will investigate and understand that organisms within an ecosystem are dependent on one another and on nonliving components of the environment. Key concepts include*** c) complex relationships within terrestrial, freshwater, and marine ecosystems ***The student will investigate and understand the unique properties and characteristics of water and its roles in the natural and human-made environment. Key concepts include*** c) the action of water in physical and chemical weathering e) the importance of water for agriculture, power generation, and public health; and f) the importance of protecting and maintaining water resources			
LS.11 a-e	**Changes in the Ecosystem and Environment** ***The student will investigate and understand the relationships between ecosystem dynamics and human activity. Key concepts include*** a) food production and harvest; b) change in habitat size, quality, or structure; c) change in species competition; d) population disturbances and factors that threaten or enhance species survival e) environmental issues ***The student will investigate and understand public policy decisions relating to the environment. Key concepts include :***	Life Science Text: Chapter 21 Sections 1-2	Population Growth Changes in Ecosystems Changes in Environment Interactive Human Impact on the Environment Garbage and Pollution Info Human's Effect on Pond life Simulation	15 days

6.9 a-d LS.10 a-c	a) management of renewable resources; b) management of nonrenewable resources; c) the mitigation of land-use and environmental hazards through preventive measures; and d) cost/benefit tradeoffs in conservation policies. ***The student will investigate and understand that ecosystems, communities, populations, and organisms are dynamic, change over time, and respond to daily, seasonal, and long-term changes in their environment. Key concepts include*** a) phototropism, hibernation, and dormancy; b) factors that increase or decrease population size; and c) eutrophication, climate changes, and catastrophic disturbances.	Life Science Text Chapter 13 Section 3	Phototropism Tutorial Eutrophication Eutrophication 2 Eutrophication Animation Primary Succession Tutorial Secondary Succession Tutorial	
LS.6 a-b	**Cycles** ***The student will investigate and understand that organisms within an ecosystem are dependent on one another and on nonliving components of the environment. Key concepts include:*** a) the carbon, water, and nitrogen cycles b) interactions resulting in a flow of energy and matter throughout the system	Life Science Text: Chapter 19 Section 1-2	Water Cycle Water Cycle Animation Nitrogen Cycle Nitrogen cycle animation Carbon Cycle Carbon Cycle Game	5 days
	FLEX day/Remediation			5 days

Reflection Notes:

3RD 9 WEEKS (1/22-3/28)

SOL	Enabling Objective: Description	Text	Recommended Activities (e.g., applets, ESS, labs)	# days to teach
				48 days
	*** A brief overview of microscopes should be provided prior to teaching L.S. 2*		Pond Organisms How to use a Microscope Powers of 10- Magnification	33 days
LS.1d	***The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which*** d) models and simulations are constructed and used to illustrate and explain phenomena		Microscope Learning Lab	
	Cells & Heredity			
LS.2 a-d	***The student will investigate and understand that all living things are composed of cells. Key concepts include*** a) cell structure and organelles; b) similarities and differences between plant and animal cells; c) development of cell theory; and d) cell division	Life Science Text: Chapter 3 Sections Life Science Text: Chapter 4 Section3	Cell Part on Cells Alive Types of Cells Plant Cells Animal Cells All About Cells Animal, Plant, and Bacterial Cell Tutorial Inside a Cell (Adv) Diffusion Plant and Animal Cell Venn Diagram Worksheet Plant and Animal Comparison Rap Video Cell Theory Song Video	
LS.3 a,b	***The student will investigate and understand that living things show patterns of cellular organization. Key concepts include*** a) cells, tissues, organs, and systems; and b) patterns of cellular organization and their relationship to life processes in living things. ***The student will investigate and understand that organisms***	Life Science Text: Chapter 3 Section 1 Chapters	Mitosis/ Cell division Animation Mitosis on Cells Alive NOVA How Cells Divide Organization of Life Reading Comp. Worksheet Organ Systems What Organs Make each Organ System?	

LS.12 a-f	***reproduce and transmit genetic information to new generations. Key concepts include*** a) the structure and role of DNA; b) the function of genes and chromosomes; c) genotypes and phenotypes; d) characteristics that can and cannot be inherited; e) genetic engineering and its applications; and f) historical contributions and significance of discoveries related to genetics	5 and 6 Sections 1-2 In Both	Organization of Life Tutorial DNA Extraction Lab Heredity Pea Experiment Punnett Squares Tour of the Basics (DNA, Genes, etc)	
LS.13a-c	**Animal Adaptations** ***The student will investigate and understand that populations of organisms change over time. Key concepts include*** a) the relationships of mutation, adaptation, natural selection, and extinction; b) evidence of evolution of different species in the fossil record; and c) how environmental influences, as well as genetic variation, can lead to diversity of organisms.	Life Science Text: Chapters 7 and 8 Sections 1-3 In Both	Animal Adaptations Darwin's Natural Selection Animal Adaptations 2 Plant Adaptations D arwin's D iary Mutation of bug and Survival Animal Adaptation Game	10 days
	FLEX days& REMEDIATION			5 days

Reflection Notes:

4TH 9 WEEKS (4/1-6/6)				
SOL	**Enabling Objective: Description**	**Text**	**Recommended Activities (e.g., applets, ESS, labs)**	**# days to teach**
				43 days
	Classification			41 days
LS.1 b	***The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which*** b) a classification system is developed based on multiple attributes	Life Science Text: Chapter 9 Sections 1-2	Variation and Classification Classification Classification power point Invertebrate and Vertebrate Sort backyard nature (kingdom and phylum) Classifying Animals	
LS.7 a-b	**The student will investigate and understand that interactions exist among members of a population. Key concepts include** a) competition, cooperation, social hierarchy, b) territorial imperative; and influence of behavior on a population	Life Science Text: Chapters 10-17	Ecology and food web simulation	
LS.4 a-d	***The student will investigate and understand how organisms can be classified. Key concepts include*** a) the distinguishing characteristics of domains of organisms; b) the distinguishing characteristics of kingdoms of organisms; c) the distinguishing characteristics of major animal phyla and plant divisions; and d) the characteristics that define a species.	All sections	Tardigrades Vertebrates Invertebrates Arthropods The Kingdoms Gymnosperms Angiosperms Mosses and Ferns	
	POST-TEST (for Teacher Evaluation & School Improvement goal: test should be same as PRE-TEST)			2 day

Reflection Notes:

Reporting Categories are the same as well as the number of items within each category. However, some content has been added or deleted. See the changes listed below the Blueprint summary table.

Blueprint Summary		**2003**			**2010**
Reporting Category	**SOLs** -----*(significant changes are in bold print).* See Crosswalk, Brief Notes below, & Curriculum framework for details	**#items**	**% of test**	**#items**	**% of test**
Scientific Investigation	6.1a-l, **LS.1a-i**,	10	20%	10	20%
Force, Motion, Energy, & Matter	6.2a, 6.2e, 6.4a-g, 6.5a-b, 6.6a,	15	30%	15	30%
Life Systems	LS.2a-d, LS.3a-b, **LS.4a**-d, LS.5a-c, **LS.12a**-f, LS.13a	7	14%	7	14%
Ecosystems	6.7a-g, LS.6a-d, LS.7a-b, LS.8a-e, LS.9a-c, LS.10a-c, LS.11a-e	7	14%	7	14%
Earth & Space Systems	6.2b-d, 6.3a-e, **6.5c-f**, **6.6b-f**, **6.8a**-i, 6.9a-d	11	22%	11	22%

Brief List of SOL Changes: Science Crosswalk between 2003 and 2010 standards

6th grade SOL changes

-The old **6.5e** (the origin and occurrence of water on Earth) was deleted.
-The old **6.6g** was moved to **6.6d.**
-For **6.8a**, there was a content addition (*dwarf planets*) to the bullet.

Life Science SOL changes

-**LS.1b**, content removed (variables are defined)
-**LS.1b** new content was added (a classification system is developed based on multiple attributes)
-**LS.1c** content removed (metric units, SI—International System of Units are used)
-**LS.1c** new content was added, (triple beam & electronic balances, thermometers, metric rulers, graduated cylinders & probeware are used to gather data)
-**LS.1i** content emphasis was narrowed ("interpretations of data became patterns of data")
-**LS.1j** new content was added, (current applications are used to reinforce life science concepts)

-**LS.4** content was removed, "The student will investigate & understand that the basic needs of organisms must be met in order to carry out life processes. Key concepts include: a) plant needs, b) animal needs, c) factors that influence life processes.
-**LS.4a**, new content was added (the distinguishing characteristics of domains of organisms)
-**LS.13a** was moved to **LS.12a**, additional content was added (structure & role of DNA)
-**LS.13d**, content was deleted (factors affecting the expression of traits)

Additional Resources

Brain Pop http://www.brainpop.com/science/
Discovery Education/ United Streaming http://streaming.discoveryeducation.com/
Scholastic Study Jams http://studyjams.scholastic.com/studyjams/jams/science/index.htm

LS.1
Science news for kids

LS.4
Animals

LS. 9
Biomes
Biome Resources

LS.10
Biome Resources

6.6
Weather
Weather, Ocean, Maps, Atmosphere Can be used year long

6R Science SOL Course Content Overview

1st 9 weeks=	44 days
Introduction	**3 days**
Science Investigation & Measurement	**14 days**
(includes: Weather & Measurement)	
Ecosystems	**22 days**

2nd 9 weeks=	45 days
Food Chains & Food Webs	**10 days**
Ecosystems & Change	**10 days**
Watershed Systems	**20 days**

3rd 9 weeks=	48 days
Environmental Changes	**17 days**
Cells & Heredity	**26 days**

4th 9 weeks=	43 days
Animal Adaptations	**10 days**
Classification & Photosynthesis	**27 days**