Morgan County Schools
4th Grade Pacing Guide
This is a working document

Science Curriculum 4th grade - Suggested Pacing for Next Generation Science Standards
1st, 2nd, 3rd, and 4th Nine Weeks: Engineering Design (teach within other topics)
1st Nine Weeks – Earth's Systems: Processes that Shape the Earth
2nd Nine Weeks – Energy
3rd Nine Weeks – Waves: Waves and Information
4th Nine Weeks – Structure, Function, and Information Processing

Engineering Design		
Objective Description	Nine Weeks	Resources
3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.	1st Nine Weeks – Earth's Systems	
	2nd Nine Weeks – Energy	
	3rd Nine Weeks – Waves and Information	
	4th Nine Weeks – Structure, Function, and Information Processing	
3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.	1st Nine Weeks – Earth's Systems	
	2nd Nine Weeks – Energy	
	3rd Nine Weeks – Waves and Information	
	4th Nine Weeks – Structure, Function, and Information Processing	

3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of model or prototype that can be improved.	1st Nine Weeks – Earth's Systems	
	2nd Nine Weeks – Energy	
	3rd Nine Weeks – Waves and Information	
	4th Nine Weeks – Structure, Function, and Information Processing	

Earth's Systems			
Objective Description	Clarification Statement or Examples	Instructional Activities	
S.4.GS.11 Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in landscape over time.	Examples of evidence from patterns could include rock layers with marine shell fossils above rock layers with plant fossils and no shells, indicating a change from land to water over time; and, a canyon with different rock layers in the walls and a river in the bottom, indicating that over time a river cut through a rock. Reference Earth Science textbook Chapter 2.		
S.4.GS.12 Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.	Examples of variables to test could include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow. Reference Earth Science textbook Chapter 4.		
S.4.GS.13 Analyze and interpret data from maps to describe patterns of Earth's features.	Maps can include topographic maps of Earth's land and ocean floor, as well as maps of the locations of mountains, continental boundaries, volcanoes, and earthquakes.		

S.4.GS.14 Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.	Examples of solutions could include designing an earthquake resistant building and improvement in monitoring volcanic activity. Reference Earth Science textbook chapter 5.		

Energy			
Objective Description	Clarification Statement or Examples	Instructional Activities	
S.4.GS.1 Use evidence to construct an explanation relating the speed of an object to the energy of that object.	Clarification Statement: The faster a given object is moving the more energy it possesses. Reference Physical Science textbook Chapter 3		
S.4.GS.2 Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.	Clarification Statement: Energy can be moved from place to place by moving objects or through sound, light, or electric currents. Reference Physical Science textbook Chapter 5 & 7		Literacy:
S.4.GS.3 Ask questions and predict outcomes about the changes in energy that occur when objects collide.	Clarification Statement: Emphasis is on the change in the energy due to the change in speed, not on the forces, as objects interact. Reference Physical Science textbook Chapter 5		
S.4.GS.4 Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.	Clarification Statement: Examples of devices could include electric circuits that convert electrical energy into motion energy of a vehicle, light, or sound; and, a passive solar heater that converts light into heat. Examples of constraints could include the materials, cost, or time to design the device.		
S.4.GS.5 Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.	Clarification Statement: Renewable energy resources include wind energy, water behind dams, and sunlight; non-renewable energy resources are fossil fuels and fissile (able to undergo nuclear fission) materials. Environmental effects include loss of habitat due to dams or surface mining, and air pollution from burning of fossil fuels.		

Waves: Waves and Information			
Objective Description	Clarification Statement or Examples	Instructional Activities	
S.4.GS.6 Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.	Examples of models could include diagrams, analogies, and physical models using wire to illustrate wavelength and amplitude of waves. Reference Physical Science textbook chapter 6		
S.4.GS.7 Generate and compare multiple solutions that use patterns to transfer information.	Examples of solutions could include drums sending coded information through sound waves, using a grid of 1's and 0's representing black and white to send information about a picture, and using Morse code to send text.		

Notes

Pacing is suggested and suggested resources may overlap 9-week periods.

Structure, Function, and Information Processing			
Objective Description	Clarification Statement or Examples	Instructional Activities	
S.4.GS.8 Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.	Clarification Statement: An object can be seen when light reflected from its surface enters the eye.		
S.4.GS.9 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.	Examples of structure could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin. Reference Life Science textbook Chapter 4		
S.4.GS.10 Use a model to describe that animals receive different types of information through their senses,	Clarification Statement: Emphasis is on systems of information transfer.		

process the information in their brain, and respond to the information in different ways.			