



# Gulfport School District PACING GUIDE

## SIXTH GRADE SCIENCE

Content Strands: Inquiry (I), Life (L), Earth and Space (E), and Physical Science (P)	
QTR	Competency/Objective
<b>Conduct a scientific investigation utilizing appropriate process skills. (I)</b>	
1-4 Tested 4	1a Design and conduct an investigation that includes predicting outcomes, using experimental controls, and making inferences. (DOK 3)
1-4 Tested 4*	1b Distinguish between qualitative and quantitative observations and make inferences based on observations. (DOK 3)
1-4  Tested 1*  Tested 4 Tested 2* Tested 4* Tested 4	1c Use simple tools and resources to gather and compare information (using standard, metric, and non-standard units of measurement). (DOK 1) <ul style="list-style-type: none"> <li>• Tools (e.g., English rulers [to the nearest one-sixteenth of an inch], metric rulers [to the nearest millimeter], thermometers, scales, hand lenses, microscopes, balances, clocks, calculators, anemometers, rain gauges, barometers, hygrometers)</li> <li>• Tools (e.g., telescopes, compasses, spring scales)</li> <li>• Types of data (e.g., mass, volume, temperature, time, area, perimeter)</li> <li>• Types of data (e.g., linear measures)</li> <li>• Resources (e.g., Internet, electronic encyclopedias, journals, community resources, etc.)</li> </ul>
1-4 Tested 4*	1d Analyze data collected from a scientific investigation to construct explanations and draw conclusions. (DOK 3)
1-4 Tested 4.1*	1e Communicate scientific procedures and conclusions using diagrams, charts, tables, graphs, maps, written explanations, and/or scientific models. (DOK 2)
1-4 Tested 4	1f Evaluate the results or solutions to problems by considering how well a product or design met the challenge to solve a problem. (DOK 3)
1-4 Tested 4.1*	1g Infer explanations for why scientists might draw different conclusions from a given set of data. (DOK 2)
1-4 Tested 4	1h Recognize and analyze alternative explanations and predictions. (DOK 2)
<b>Analyze chemical and physical changes and interactions involving energy and forces that affect motion of objects. (P)</b>	
2	2a Recognize that atoms of a given element are all alike but atoms of other elements have different atomic structures. (DOK 1)

\*These skills are tested during the indicated Quarter and correlated with the Mathematics pacing guide.



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	<b>Analyze chemical and physical changes and interactions involving energy and forces that affect motion of objects. (P)</b>
2	2b Distinguish physical properties of matter (e.g., melting points, boiling points, solubility) as it relates to changes in states. (DOK 2) <ul style="list-style-type: none"> <li>• Between solids, liquids, and gases through models that relate matter to particles in motion</li> <li>• Solubility in water of various solids to activities (e.g., heating, stirring, shaking, crushing) on the rate of solution</li> <li>• Use of solubility differences to identify components of a mixture (e.g., chromatography)</li> </ul>
1	2c Investigate and describe the effects of forces acting on objects. (DOK 2) <ul style="list-style-type: none"> <li>• Gravity, friction, magnetism, drag, lift, and thrust</li> <li>• Forces affecting the motion of objects</li> </ul>
2	2d Investigate the mechanical and chemical forms of energy and demonstrate the transformations from one form to another. (DOK 2) <ul style="list-style-type: none"> <li>• Energy transformations represented in the use of common household objects</li> <li>• Mechanical energy transformed to another form of energy (e.g., vibrations, heat through friction)</li> <li>• Chemical energy transformed to another form of energy (e.g., light wands, lightning bugs, batteries, bulbs)</li> </ul>
2	2e Apply the laws of reflection and refraction to explain everyday phenomena. (DOK 2) <ul style="list-style-type: none"> <li>• Properties of reflection, refraction, transmission, and absorption of light</li> <li>• Images formed by plane, convex, and concave lenses and mirrors, and reflecting and refracting telescopes</li> <li>• Objects that are opaque, transparent, or translucent</li> </ul>
1	2f Develop a logical argument to explain how the forces which affect the motion of objects has real-world applications including (but not limited to) examples of Mississippi's contributions as follows: (DOK 3) <ul style="list-style-type: none"> <li>• Automotive industry (Nissan's new production plant is located in Canton, MS.; Toyota's new facility is in Tupelo, MS.)</li> <li>• Aerospace industry (The Raspet Flight Research Laboratory, housed at Mississippi State University, is one of the premier university flight research facilities in the country.)</li> </ul> Shipbuilding industry (Ingall's Shipbuilding, of Pascagoula, MS, is a leading supplier of marine vessels to the United States Navy.)



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2	2g Predict and explain factors that affect the flow of heat in solids, liquids, and gases. (DOK 3) <ul style="list-style-type: none"> <li>• Insulating factors in real life applications (e.g., building, construction, clothing, animal covering)</li> <li>• Conduction, convection, or radiation factors used to enhance the flow of heat</li> <li>• Temperature differences on the movement of water</li> </ul>
	<b>Explain the organization of living things, the flow of matter and energy through ecosystems, the diversity and interactions among populations, and the natural and human-made pressures that impact the environment. (L)</b>
4	3a Describe and predict interactions (among and within populations) and the effects of these interactions on population growth to include the effects on available resources. (DOK 2) <ul style="list-style-type: none"> <li>• How cooperation, competition, and predation affect population growth</li> <li>• Effects of overpopulation within an ecosystem on the amount of resources available</li> <li>• How natural selection acts on a population of organisms in a particular environment via enhanced reproductive success</li> </ul>
3	3b Compare and contrast structure and function in living things to include cells and whole organisms. (DOK 2) <ul style="list-style-type: none"> <li>• Hierarchy of cells, tissues, organs, and organ systems to their functions in an organism</li> <li>• Function of plant and animal cell parts (vacuoles, nucleus, cytoplasm, cell membrane, cell wall, chloroplast)</li> <li>• Vascular and nonvascular plants, flowering and non-flowering plants, deciduous and coniferous trees</li> </ul>
3	3c Distinguish between the organization and development of humans to include the effects of disease. (DOK 2) <ul style="list-style-type: none"> <li>• How systems work together (e.g., respiratory, circulatory)</li> <li>• Fertilization, early cell division, implantation, embryonic and fetal development, infancy, childhood, adolescence, adulthood, and old age</li> <li>• Common diseases caused by microorganisms (e.g., bacteria, viruses, malarial parasites)</li> </ul>



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3	3d Describe and summarize how an egg and sperm unite in the reproduction of angiosperms and gymnosperms. (DOK 1) <ul style="list-style-type: none"> <li>• The path of the sperm cells to the egg cell in the ovary of a flower</li> <li>• The structures and functions of parts of a seed in the formation of a plant and of fruits</li> <li>• How the combination of sex cells results in a new combination of genetic information different from either parent</li> </ul>
4	3e Construct a diagram of the path of solar energy through food webs that include humans and explain how the organisms relate to each other. (DOK 2) <ul style="list-style-type: none"> <li>• Autotrophs and heterotrophs, producers, consumers and decomposers</li> <li>• Predator/prey relationships, competition, symbiosis, parasitism, commensalisms, mutualism</li> </ul>
	<b>Establish connections among Earth's layers including the lithosphere, hydrosphere, and atmosphere. (E)</b>
1	4a Compare and contrast the relative positions and components of the Earth's crust (e.g., mantle, liquid and solid core, continental crust, oceanic crust). (DOK 1)
1	4b Draw conclusions about historical processes that contribute to the shaping of planet Earth. (DOK 3) <ul style="list-style-type: none"> <li>• Movements of the continents through time</li> <li>• Continental plates, subduction zones, trenches, etc.</li> </ul>
1	4c Analyze climate data to draw conclusions and make predictions. (DOK 2)
4	4d Summarize the causes and effects of pollution on people and the environment (e.g., air pollution, ground pollution, chemical pollution) and justify how and why pollution should be minimized. (DOK 1)



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1	4e Explain the daily and annual changes in the Earth's rotation and revolution. (DOK 2) <ul style="list-style-type: none"> <li>• How the positions of the Moon and the Sun affect tides</li> <li>• The phases of the Moon (e.g., new, crescent, half, gibbous, full, waxing, waning)</li> </ul>
1	4f Differentiate between objects in the universe (e.g., stars, moons, solar systems, asteroids, galaxies). (DOK 1)
4	4g Research and cite evidence of current resources in Earth's systems. (DOK 3) <ul style="list-style-type: none"> <li>• Resources such as fuels, metals, fresh water, wetlands, and farmlands</li> <li>• Methods being used to extend the use of Earth's resources through recycling, reuse, and renewal</li> <li>• Factors that contribute to and result from runoff {e.g., water cycle, groundwater, drainage basin (watershed)}</li> </ul>