



Gulfport School District PACING GUIDE

MICROBIOLOGY

Content Strands: Inquiry (I), Life Sciences (L)		
QTR	Competency/Objective	
Apply inquiry-based and problem-solving processes and skills to scientific investigations. (I)		
1.1 to 1.2	1a	Use current technologies such as CD-ROM, DVD, Internet, and on-line data search to explore current research related to a specific topic. (DOK 3)
1.1 to 1.2	1b	Clarify research questions and design laboratory investigations. (DOK 3)
1.1 to 1.2	1c	Demonstrate the use of scientific inquiry and methods to formulate, conduct, and evaluate laboratory investigations (e.g., hypotheses, experimental design, observations, data analyses, interpretations, theory development). (DOK 3)
1.1 to 1.2	1d	Organize data to construct graphs (e.g., plotting points, labeling x-and y-axis, creating appropriate titles and legends for circle, bar, and line graphs) draw conclusions and make inferences. (DOK 3)
1.1 to 1.2	1e	Evaluate procedures, data, and conclusions to critique the scientific validity of research. (DOK 3)
1.1 to 1.2	1f	Formulate and revise scientific explanations and models using logic and evidence (data analysis). (DOK 3)
1.1 to 1.2	1g	Collect, analyze, and draw conclusions from data to create a formal presentation using available technology (e.g., computers, calculators, SmartBoard, CBL's, etc.) (DOK 3)
Develop understandings about the importance of historical microbiology to today's society. (L)		
1.1	2a	Analyze and draw conclusions about of the work of Robert Koch. (DOK 2) <ul style="list-style-type: none"> • Discovery that microorganisms cause disease • Importance of Koch's postulates
1.1	2b	Research the societal and economic contributions of scientists (e.g., Louis Pasteur, John Snow, Edward Jenner, Joseph Lister, Alexander Fleming, etc.) and explain their impact on microbiology. (DOK 2)
1.1	2c	Research and evaluate the relevance of various careers in modern microbiology. (DOK 2)
Explore and demonstrate an understanding of the classification of microorganisms. (L)		
1.1	3a	Cite examples to differentiate between the characteristics of eukaryotes and prokaryotes. (DOK 1)
1.1	3b	Cite examples and compare the characteristics of prokaryotes, fungi, and protists. (DOK 2)
Investigate and summarize concepts related to pathogenic microbiology. (L)		
1.2	4a	Research and interpret with examples the causes and effects of epidemics and pandemics. (DOK 2)
1.2	4b	Justify an explanation of strategies that can be used to reduce a person's chance of becoming infected with a pathogen. (DOK 3) <ul style="list-style-type: none"> • Vaccination as it relates to immunity • Hospital procedures for dealing with infectious diseases



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Content Strands: Inquiry (I), Physical Sciences (P)		
QTR	Competency/Objective	
	Examine and evaluate the classification, morphology, characteristics, pathology, and benefits associated with bacteria. (L)	
1.1	5a	Differentiate between eubacteria and archaebacteria (DOK 1)
1.1	5b	Analyze and distinguish the characteristics of bacteria. (DOK 2) <ul style="list-style-type: none"> • Shapes, motility structures, formation of endospores and capsules • Structure and function of internal and external bacterial cell components • Principles of Gram staining
1.1	5c	Research and explain the characteristics, causes, and treatments of bacterial diseases. (DOK 2)
1.1	5d	Explain and describe the factors leading to antibiotic resistance among bacteria and predict its potential impacts on society. (DOK 2)
1.1	5e	Research and evaluate the beneficial aspects of bacteria in medicine, industry, and daily life. (DOK 3)
	Differentiate among the growth requirements of bacteria. (L)	
1.1	6a	Describe growth requirements of bacteria. (DOK 2) <ul style="list-style-type: none"> • Effectiveness of household antiseptics and disinfectants in controlling bacterial growth • Effect of pH and temperature on bacterial growth
1.1	6b	Compare and contrast aerobes and anaerobes, both facultative and obligative, and predict their impact on human life. (DOK 2)
1.1	6c	Compare and interpret the results of investigations with various growth mediums. (DOK 3)
	Develop an understanding of classification, morphology, characteristics, pathology and benefits associated with viruses. (L)	
1.2	7a	Research and explain the characteristics, causes, and treatments of viral diseases, (e.g., smallpox, polio, influenza, measles, rabies, tumor viruses, common cold, hepatitis, herpes simplex I and II, chickenpox, shingles, HIV, warts, genital warts, etc.) (DOK 3) <ul style="list-style-type: none"> • Structure of viruses, including a phage virus • Methods to culture viruses in a laboratory • Life cycle of a virus
1.2	7b	Cite evidence and explanations to defend the societal and economic importance of viruses. (DOK 2)
	Develop an understanding of the classification, morphology, characteristics, pathology, and benefits associated with fungi. (L)	
1.2	8a	Summarize the characteristics, causes, and treatment of the most common types of fungal diseases. (DOK 2) <ul style="list-style-type: none"> • Structure of fungal cells • Growth requirements and reproduction of fungi • Methods to culture fungi in a laboratory



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Content Strands: Inquiry (I), Earth and Space (E), Field Experiences (F)		
QTR	Competency/Objective	
	Develop an understanding of the classification, morphology, characteristics, pathology, and benefits associated with fungi. (L)	
1.2	8b	Cite evidence and explanations to support the societal and economic significance of fungi. (DOK 2)
	Demonstrate an understanding of microorganisms as they relate to food processes. (L)	
1.1	9a	Analyze and evaluate microbial actions in major industrial processes involving foods. (DOK 3) <ul style="list-style-type: none"> • Process of pasteurization of milk and its effect on microorganisms • Process of fermentation in producing certain foods. • Microbial problems in the slaughter of animals and preservation of fresh meat • Importance of bacteria in the process of making certain foods • E.coli–related outbreaks in meats and produce
1.1	9b	Compare and contrast methods of food preservation. (DOK 2) <ul style="list-style-type: none"> • Home canning and industrial canning • Dehydration • Meals, Ready-to-Eat technology (MRE)
1.1	9c	Describe the causes and effects of food poisoning and discuss preventive strategies. (DOK 2)