

BENCHMARK REPORT

SCIENCE GRADE 8



DOMAIN: Science

NGSS/ Aspire Practices	OCS Code:	Standards and Benchmarks	DOK
Strand: MS. Structure, Function, and Information Processing: MS-LS1 From Molecules to Organisms: Structures and Processes			
Practice 8	MS-LS1-8.	Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.	
	8-LS1-8.1a	List the functions of stimuli, sensory receptors, synapses, and neural pathways	1
	8-LS1-8.2b	Relate the response of sensory receptors to visual or auditory stimuli	2
	8-LS1-8.cb	Gather information on the effects of sensory receptors and neural pathways on human actions and memory	2
	8-LS1-8.4d	Synthesize information that shows the sequence of information flow from visual or auditory stimuli through sensory receptors and neural pathways to produce human actions or memory acquisition	4
Strand: MS. Matter and Energy in Organisms and Ecosystems: MS-LS2 Ecosystems: Interactions, Energy, and Dynamics			
Practice 7	MS-LS2-4.	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.	
	8-LS2-4.1b	Gather information on the biotic (living) and abiotic (nonliving) factors that affect the growth of a population within a specific ecosystem	2
	8-LS2-4.2b	Gather information on resource limitations that effect the growth and reproduction of a population within a specific ecosystem	2
	8-LS2-4.3b	Find examples of different ways that growth and reproduction changes in a specific ecosystem	2
	8-LS2-4.4d	Construct an argument supported by evidence that changes to the ecosystem affect the populations within a specific ecosystem	4
Strand: MS. Interdependent Relationships in Ecosystems: MS-LS2 Ecosystems: Interactions, Energy, and Dynamics			
Practice 7	MS-LS2-5.	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.	
	8-LS2-5.1a	Define biodiversity, ecosystem services, and design solutions	1
	8-LS2-5.2b	Identify species that maintain a healthy terrestrial or oceanic ecosystem	2
	8-LS2-5.3b	Identify ecosystem services that maintain a healthy terrestrial or oceanic ecosystem	2
	8-LS2-5.4c	Analyze a specific species or ecosystem service that solves a problem faced in a terrestrial or oceanic ecosystem	3
	8-LS2-5.5d	Develop multiple solutions to a problem faced in a terrestrial or oceanic ecosystem	4
	8-LS2-5.6d	Evaluate the scientific, economic, and social ramifications of the best solution to a problem faced in a terrestrial or oceanic ecosystem	4
Strand: MS. Growth, Development, and Reproduction of Organisms: MS-LS4 Biological Evolution: Unity and Diversity			
Practice 8	MS-LS4-5.	Gather and synthesize information about the technologies that have changed the way humans influence the inheritance of desired traits in organisms.	
	8-LS4-5.1a	Define genes, chromosomes, protein production, and mutations	1
	8-LS4-5.2b	Gather information on human technologies that affect genetic outcomes based on artificial selection	2
	8-LS4-5.3d	Synthesize information on the societal and scientific impacts of changes in genetic outcomes that occur as a result of a specific human technology	4
Strand: MS. Natural Selection and Adaptations: MS-LS4 Biological Evolution: Unity and Diversity			
Practice 4	MS-LS4-1.	Analyze and interpret data for patterns in the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth under the assumption that natural laws operate today as in the past.	
	8-LS4-1.1a	Define natural law, diversity, extinction, change of life forms, and fossil records	1

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	8-LS4-1.2b	Trace the development of an organism using fossil records over time	2
	8-LS4-1.3d	Analyze patterns of change in the fossil records from an organism over time to document diversity, extinction, or life form changes	4
Practice 6	MS-LS4-2.	Apply scientific ideas to construct an explanation for the anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer evolutionary relationships.	
	8-LS4-2.1b	Find information on the scientific use of fossil records to show the evolutionary history of organisms	2
	8-LS4-2.2b	Locate several examples of a single celled life form, plant, or animal found in fossils	2
	8-LS4-2.3b	Gather information on the physical body/arrangement of parts for several single celled life forms, plants, or animals found in fossils	2
	8-LS4-2.4b	Trace the development of the physical body/arrangement of parts for several single celled life forms, plants, or animals from their fossil to their modern state	2
	8-LS4-2.5b	Compare the physical body/arrangement of parts of several single celled life forms, plants, or animals from their fossil to their modern state	2
	8-LS4-2.6b	Compare the physical body/arrangement of parts for several single celled life forms, plants, or animals in their modern state	2
	8-LS4-2.7d	Apply scientific concepts to explain evolutionary changes in the physical body/arrangement of parts for several single celled life forms, plants, or animals from fossils to their modern state	4
Practice 4	MS-LS4-3.	Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy.	
	8-LS4-3.1a	Define embryo, embryological development, and development sequence of embryos	1
	8-LS4-3.2b	Identify three species, or sets of animals or plants, members of which have similar characteristics to each other and which can breed with other	2
	8-LS4-3.3b	Gather displays of pictorial data representing embryological development for three species of animals or plants	2
	8-LS4-3.4c	Analyze patterns of similarities in the embryological development of three species of animals or plants (not including their physical appearance)	3
Practice 6	MS-LS4-4.	Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment.	
	8-LS4-4.1a	Define genes, genomes, heritable traits, mutations, and natural selection	1
	8-LS4-4.2b	Find several examples of genetic traits that help plants or animals (including humans) in a specific environment survive and reproduce	2
	8-LS4-4.3b	Explain the process by which genetic variations help plants or animals survive and reproduce in a specific environment	2
	8-LS4-4.4c	Cite evidence to support the explanation that genetic variations in traits can increase the probability that plants or animals will survive and reproduce in a specific environment	3
Practice 5	MS-LS4-6.	Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time.	
	8-LS4-6.1b	Find at least three examples of plants or animals that adapted to changes in their environment in order to survive and reproduce and at least three examples of plants or animals that did not adapt and died	2
	8-LS4-6.2b	Outline the steps that occur during the process of natural selection that lead to increases and decreases in the genetic traits of plants or animals because of changes in their specific environment over time	2

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	8-LS4-6.3d	Apply mathematical representations using models, probability statements, or proportional reasoning to show how the process of natural selection increases and decreases genetic traits of plants or animals over time	4
Strand: MS. History of Earth: MS-ESS1 Earth's Place in the Universe			
Practice 6	MS-ESS1-4.	Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.	
	8-ESS1-4.1a	Define rock strata and the components of a geological time scale	1
	8-ESS1-4.2a	List different ways that rock strata/fossil data are used to establish a geological time scale of the relative ages of events in Earth's history	1
	8-ESS1-4.3c	Create a geological time scale containing era, period, dates, rock strata/fossil data collected during the period, and major events in Earth's history	3
	8-ESS1-4.4d	Synthesize information about the use of rock strata/fossil data to provide the scientific basis of a geological time scale mapping out the major events in Earth's history	4
Strand: MS. Weather and Climate: MS-ESS3 Earth and Human Activity			
Practice 1	MS-ESS3-5.	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.	
	8-ESS3-5.1b	Locate scientific data on human activities and natural processes that have caused the rise in global temperature over the past century	2
	8-ESS3-5.2c	Generate questions based on an analysis of scientific data to clarify the role of human activities and natural processes in causing the rise in global temperature over the past century	3
Strand: MS. Human Impacts: MS-ESS3 Earth and Human Activity			
Practice 6	MS-ESS3-3.	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.	
	8-ESS3-3.1b	Identify problems caused by current water usage, land usage, or pollution on the environment	2
	8-ESS3-3.2b	Gather scientific data that shows the impact of a specific problem caused by water usage, land usage, or pollution on the environment	2
	8-ESS3-3.3d	Analyze the effectiveness of current solutions to reduce the impact a specific problem caused by water usage, land usage, or pollution	4
	8-ESS3-3.4d	Apply scientific principles to design a new solution for reducing the impact a specific problem caused by water usage, land usage, or pollution	4
Practice 7	MS-ESS3-4.	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.	
	8-ESS3-4.1b	Identify general effects of the consumption of food and natural resources on the Earth's systems	2
	8-ESS3-4.2b	Gather scientific data on the relationship between per-capita rates of consumption of food and natural resources to changes in the appearance, composition, or structure of Earth's systems	2
	8-ESS3-4.3d	Create a visual representation of changes in the appearance, composition, or structure of Earth's systems when the per-capita consumption of food and natural resources increases	4
	8-ESS3-4.4c	Cite evidence based on scientific data and reasoning to show how increases of the per-capita consumption of food and natural appearances changes the appearance, composition, or structure of Earth's systems	3