



Earth Science	
EARTH'S PLACE IN THE UNIVERSE	
Louisiana Student Standards	Louisiana Connectors (LC)
HS-ESS1-1 Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun's core to release energy that eventually reaches Earth in the form of radiation.	LC-HS-ESS1-1a Describe components of a model illustrating that the sun shines because of nuclear fusion reactions which release light and heat energy which make life on Earth possible.
HS-ESS1-3 Communicate scientific ideas about the way stars, over their life cycle, produce elements.	LC-HS-ESS1-3a Communicate by using models that solar activity creates elements through nuclear fusion.
HS-ESS1-4 Use mathematical or computational representations to predict the motion of orbiting objects in the solar system.	LC-HS-ESS1-4a Recognize that objects in the solar system orbit the sun and have an orderly motion (e.g., elliptical paths around the sun).
	LC-HS-ESS1-4b Relate Earth's orbital characteristics to other bodies in the solar system.
	LC-HS-ESS1-4c Use a mathematical or computational representation to predict the motion of orbiting objects in the solar system.
HS-ESS1-5 Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks.	LC-HS-ESS1-5a Explain the relationship between the motion of continental plates and how materials of different ages are arranged on Earth's surface.
	LC-HS-ESS1-5b Relate/evaluate evidence of past and/or current movements in Earth's crust (plate tectonics) with the ages of crustal rocks.



Earth Science HISTORY OF EARTH	
Louisiana Student Standards	Louisiana Connectors (LC)
HS-ESS1-6 Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth’s formation and early history.	LC-HS-ESS1-6a Identify ancient Earth materials, lunar rocks, asteroids, and meteorites as sources of evidence scientists use to understand Earth’s early history.

Earth Science SPACE SYSTEMS	
Louisiana Student Standards	Louisiana Connectors (LC)
HS-ESS1-2 Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe.	LC-HS-ESS1-2a Identify that the universe is expanding and must have been smaller in the past based on astronomical evidence (i.e., light spectra, motion of distant galaxies, and composition of matter in the universe).



Earth Science EARTH'S SYSTEMS	
Louisiana Student Standards	Louisiana Connectors (LC)
HS-ESS2-1 Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features.	LC-HS-ESS2-1a Use a model of Earth to identify that the motion of the mantle and its plates occurs primarily through thermal convection, which is primarily driven by radioactive decay within Earth's interior.
HS-ESS2-2 Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth's systems.	LC-HS-ESS2-2a Identify relationships, using a model, of how the Earth's surface is a complex and dynamic set of interconnected systems (i.e., geosphere, hydrosphere, atmosphere, and biosphere).
HS-ESS2-3 Develop a model based on evidence of Earth's interior to describe the cycling of matter by thermal convection.	LC-HS-ESS2-3a Use a model of Earth to identify that the motion of the mantle and its plates occurs primarily through thermal convection, which is primarily driven by radioactive decay within Earth's interior.
HS-ESS2-4 Analyze and interpret data to explore how variations in the flow of energy into and out of Earth's systems result in changes in atmosphere and climate.	LC-HS-ESS2-4a Identify different causes of climate change and results of those changes with respect to the Earth's surface temperatures, precipitation patterns or sea levels over a wide range of temporal and spatial scales using a model.
HS-ESS2-5 Plan and conduct an investigation on the properties of water and its effects on Earth materials and surface processes.	LC-HS-ESS2-5a Identify a connection between the properties of water and its effects on Earth materials.
	LC-HS-ESS2-5b Investigate the effects of water on Earth materials and/or surface processes.
HS-ESS2-6 Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.	LC-HS-ESS2-6a Use a model of photosynthesis to identify that carbon is exchanged between living and nonliving systems.
	LC-HS-ESS2-6b Use a model of cellular respiration to identify that carbon is exchanged between living and nonliving systems.
	LC-HS-ESS2-6c Develop and/or use a quantitative model to identify relative amount of and/or the rate at which carbon is transferred among hydrosphere, atmosphere, geosphere, and biosphere.
HS-ESS2-7 Construct an argument based on evidence about the simultaneous coevolution of Earth systems and life on Earth.	LC-HS-ESS2-7a Identify examples of coevolution of Earth's systems and the evolution of life on Earth.
	LC-HS-ESS2-7b Identify evidence (e.g., causal links and/or feedback mechanisms between changes in the biosphere and changes in Earth's other systems) in an argument that there is simultaneous coevolution of Earth's systems and life on Earth.



Earth Science HUMAN SUSTAINABILITY	
Louisiana Student Standards	Louisiana Connectors (LC)
HS-ESS3-1 Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.	LC-HS-ESS3-1a Explain the relationship between human activity (e.g., population size, where humans live, types of crops grown) and changes in the amounts of natural resources using evidence.
	LC-HS-ESS3-1b Explain the relationship between human activity (e.g., population size, where humans live, types of crops grown) and changes in the occurrence of natural hazards using evidence.
HS-ESS3-2 Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.	LC-HS-ESS3-2a Identify a solution that demonstrates the most preferred cost-benefit ratios for developing, managing, and utilizing energy and mineral resources (i.e., conservation, recycling, and reuse of resources).
	LC-HS-ESS3-2b Compare design solutions for developing, managing, and/or utilizing energy or mineral resources.
HS-ESS3-3 Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.	LC-HS-ESS3-3a Use numerical data to determine the effects of a conservation strategy to manage natural resources and to sustain human society and plant and animal life.
HS-ESS3-4 Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.	LC-HS-ESS3-4a Connect a technological solution (e.g., wet scrubber; baghouse) to its outcome (e.g., clean air) and its outcome to the human activity impact that it is reducing (e.g., air pollution).
HS-ESS3-5 Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems.	LC-ESS3-5a Use geoscience data to determine the relationship between a change in climate (e.g., precipitation, temperature) and its impact in a region.
HS-ESS3-6 Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.	LC-HS-ESS3-6a Use representations to describe the relationships among Earth systems and how those relationships are being modified due to human activity (e.g., increase in atmospheric carbon dioxide, increase in ocean acidification, effects on organisms in the ocean such as coral reef, carbon cycle of the ocean, possible effects on marine populations).