|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **3rd Grade** | **5th Grade** | **6th Grade** | **7th Grade** | **8th Grade** | **HS Geology** |
| **7B-** investigates rapid changes in Earth’s surface such as volcanic eruptions, earthquakes, and landslides. | **2D-** analyze and interpret information to construct reasonable explanations from direct (observable) and indirect (inferred) evidence | 6,7,8.1A- demonstrate safe practices during laboratory and field investigations as outlined in the Texas Safety Standards | 2F- use a wide variety of additional course apparatuses, equipment, techniques, and procedures as appropriate such as satellite imagery and other remote sensing data, Geographic Information Systems (GIS), Global Positioning System (GPS), scientific probes, microscopes, telescopes, modern video and image libraries, weather stations, fossil and rock kits, bar magnets, coiled springs, wave simulators, tectonic plate models, and planetary globes |
| 1B- practice appropriate use and conservation of resources, including disposal, reuse, or recycling of materials |
| **2F-** communicate valid conclusions in [both] written [and verbal] form | 2A- plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology | 2I- communicate valid conclusions supported by data using several formats such as technical reports, lab reports, labeled drawings, graphic organizers, journals, presentations, and technical posters |
| **2G-** construct appropriate simple graphs, tables, maps, and charts using technology, including computers, to organize, examine, and evaluate information | 2B- design and implement experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology | 7A- evaluate relative dating methods using original horizontality, rock superposition, lateral continuity, cross-cutting relationships, unconformities, index fossils, and biozones based on fossil succession to determine chronological order |
| 2C- collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers |
| **3A-** in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student | 2D- construct tables and graphs, using repeated trials and means, to organize data and identify patterns | 7B- calculate the ages of igneous rocks from Earth and the Moon and meteorites using radiometric dating methods |
| 2E- analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends |
| 7C- understand how multiple dating methods are used to construct the geologic time scale, which represents Earth's approximate 4.6-billion-year history |
| 3A- in all fields of science, analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student |
| **3D-** connect grade-level appropriate science concepts with the history of science, science careers, and contributions of scientists | 3B- use models to represent aspects of the natural world such as a model of Earth's layers |  | 3B- use models to represent aspects of the natural world such as an atom, a molecule, space, or a geologic feature | 8A- analyze and evaluate a variety of fossil types such as transitional fossils, proposed transitional fossils, fossil lineages, and significant fossil deposits with regard to their appearance, completeness, and alignment with scientific explanations in light of this fossil data |
| 4A- use appropriate tools to collect, record, and analyze information, including journals/notebooks, beakers, Petri dishes, meter sticks, graduated cylinders, hot plates, test tubes, triple beam balances, microscopes, thermometers, calculators, computers, timing devices, and other equipment as needed to teach the curriculum |
| **7A-** explore the processes that led to the formation of sedimentary rocks and fossil fuels | 10A- build a model to illustrate the structural layers of Earth, including the inner core, outer core, mantle, crust, asthenosphere, and lithosphere | 8B- analyze the effects of weathering, erosion, and deposition on the environment in ecoregions of Texas | 9A- describe the historical development of evidence that supports plate tectonic theory | 8B- explain how sedimentation, fossilization, and speciation affect the degree of completeness of the fossil record |
| **7B-** recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth’s surface by wind, water, and ice | 8C- evaluate the significance of the terminal Permian and Cretaceous mass extinction events, including adaptive radiations of organisms after the events |
| 10B- classify rocks as metamorphic, igneous, or sedimentary by the processes of their formation | 8C- model the effects of human activity on groundwater and surface water in a watershed | 9B- relate plate tectonics to the formation of crustal features |
| 9A- heat transfer through Earth's subsystems by radiation, convection, and conduction and include its role in plate tectonics, volcanism, ocean circulation, weather, and climate |
| **7D-** identify fossils as evidence of past living organisms and the nature of the environments at the time using models | 10D- describe how plate tectonics causes major geological events such as ocean basins, earthquakes, volcanic eruptions, and mountain building |  |  | 9B- examine the chemical, physical, and thermal structure of Earth's crust, mantle, and core, including the lithosphere and asthenosphere |
| 9C- explain how scientists use geophysical methods such as seismic wave analysis, gravity, and magnetism to interpret Earth's structure |
| 10A- investigate how new conceptual interpretations of data and innovative geophysical technologies led to the current theory of plate tectonics |
|  |  |  |  | 10B- describe how heat and rock composition affect density within Earth's interior and how density influences the development and motion of Earth's tectonic plates |
| 10C-explain how plate tectonics accounts for geologic processes and features, including sea floor spreading, ocean ridges and rift valleys, subduction zones, earthquakes, volcanoes, mountain ranges, hot spots, and hydrothermal vents |
| 10E- distinguish the location, type, and relative motion of convergent, divergent, and transform plate boundaries using evidence from the distribution of earthquakes and volcanoes |
| 10F-evaluate the role of plate tectonics with respect to long-term global changes in Earth's subsystems such as continental buildup, glaciation, sea level fluctuations, mass extinctions, and climate change |
| 11A- compare the roles of erosion and deposition through the actions of water, wind, ice, gravity, and igneous activity by lava in constantly reshaping Earth's surface |
| 11B- explain how plate tectonics accounts for geologic surface processes and features, including folds, faults, sedimentary basin formation, mountain building, and continental accretion |
| 11C- analyze changes in continental plate configurations such as Pangaea and their impact on the biosphere, atmosphere, and hydrosphere through time |
|  | 11D- interpret Earth surface features using a variety of methods such as satellite imagery, aerial photography, and topographic and geologic maps using appropriate technologies |
|  | 11E-evaluate the impact of changes in Earth's subsystems on humans such as earthquakes, tsunamis, volcanic eruptions, hurricanes, flooding, and storm surges and the impact of humans on Earth's subsystems such as population growth, fossil fuel burning, and use of fresh water |
|  | 12A- evaluate how the use of energy, water, mineral, and rock resources affects Earth's subsystems |
|  | 12B- describe the formation of fossil fuels, including petroleum and coal |
|  | 12C- discriminate between renewable and nonrenewable resources based upon rate of formation and use |
|  | 12D- analyze the economics of resources from discovery to disposal, including technological advances, resource type, concentration and location, waste disposal and recycling, and environmental costs |
|  | 12E- explore careers that involve the exploration, extraction, production, use, and disposal of Earth's resources |
|  |  |  |

Indicates scientific investigation and reasoning. The student, for at least 40% of the instructional time, conducts laboratory and field investigations following safety procedures and environmentally appropriate and ethical practices.