**Geology Learning Goals**

**Unit 1: Maps**

**How long will we be learning this?**

* ~ 2 weeks

**By the end of this unit you should be able to:**

* Find points using longitude and latitude
* Explain the difference between longitude and latitude
* Read and interpret topographic and geologic maps
* Use geologic maps to investigate rock types, time periods, folds, and faults
* Construct an elevation profile using a topographic map
* Draw contour lines when given the contour interval and contour index
* Apply maps for planning purpose and to investigate land-use problems
* Construct topographic maps that show contour lines
* Identify what different colors indicate on a topographic map

**This is the vocabulary you should know:**

|  |  |  |  |
| --- | --- | --- | --- |
| Latitude | Longitude | Map | Key |
| Scale | Legend | Elevation | Contour interval |
| Contour index | Contour line | Topographic map |  |

**Geology Learning Goals**

**Unit 2: Running Water & Groundwater**

**How long will we be learning this?**

* ~ 2 weeks

**By the end of this unit you should be able to:**

* Illustrate the hydrologic cycle and distinguish among condensation, evaporation, precipitation, transpiration, groundwater, runoff, and surface water reservoirs
* Differentiate between stream velocity, discharge, gradient, channel shape, channel size, channel roughness, porosity, permeability, left bank, right bank, and predict how these characteristics will change
* Calculate stream discharge, stream velocity, and average stream velocity using the 6/10ths rule
* Describe the fluvial processes of erosion and deposition
* Describe groundwater, its characteristics, and featured formed from it
* Investigate ground water pollution and ways to protect groundwater resources

**This is the vocabulary you should know:**

|  |  |  |  |
| --- | --- | --- | --- |
| Hydrologic cycle | Condensation | Precipitation | Evaporation |
| Run off | Transpiration | Infiltration | Groundwater |
| Dissolved load | Suspended load | Bed load | Competence |
| Velocity | Discharge | Gradient | Porosity |
| Permeability | Capacity | Sorting | Alluvium |
| Levees | Alluvial valleys | Alluvial fans | Deltas |
| Base level | Divide | Drainage basin | Dendritic drainage |
| Trellis drainage | Left & right bank | Radial drainage | Rectangular drainage |
| Zone of saturation | Zone of aeration | Water table | Aquitards |
| Aquifers | Wells | Springs | Hot springs |
| Geysers | Drawdown | Cone of depression | Cavern |
| Stalagmite | Stalactite | Sinkhole | Land subsidence |

**Geology Learning Goals**

**Unit 3: Soil & Mass Movements**

**How long will we be learning this?**

* ~ 2 weeks

**By the end of this unit you should be able to:**

* Describe the different components of good soil
* Identify good and poor soil characteristics
* Describe different soil textures
* Identify each soil texture’s permeability & porosity
* Use a diagram to calculate the % clay, silt, and sand given in a soil sample
* Explain how different factors like parent material, time, climate, organisms, and slope affect soil formation
* Identify, describe, and draw different layers of soil and different types of soil
* Describe how soil is eroded and how to control soil erosion
* Identify and describe types of mass movements based on type of motion, type of material, and rate of motion

**This is the vocabulary you should know:**

|  |  |  |  |
| --- | --- | --- | --- |
| Regolith | Mineral matter | Humus | Parent material |
| Loam | Soil horizon | Soil profile | Sub soil |
| Top soil | A horizon | B horizon | C horizon |
| Pedalfer | Pedocal | Laterite | Windbreaks |
| Terracing | Mass movement | Cohesive strength | Rockslide |
| Rock fall | Slump | Mudflow | Earth flow |
| Creep  |  |  |  |

**Geology Learning Goals**

**Unit 4: Deserts, Winds, and Features of the Southwest**

**How long will we be learning this?**

* ~ 1 week

**By the end of this unit you should be able to:**

* Explain the role of water and wind in weathering and erosion of the desert
* Identify the major desert regions of the SW United States
* Describe and identify features of the southwest
* Identify and differentiate between different types of sand dunes

**This is the vocabulary you should know:**

|  |  |  |  |
| --- | --- | --- | --- |
| Ephemeral | Arroyo | Playa Lake | Deflation |
| Abrasion | Desert pavement | Loess | Colorado Plateau |
| Basin & Range | Plateau | Mesa | Butte |
| Hogback | Cuesta | Monocline | Bajada |
| Pediment | Cross beds | Barchans dunes | Transverse dunes |
| Barchanoid dunes | Longitudinal dunes | Parabolic dunes | Star dunes |

**Geology Learning Goals**

**Unit 5: Geologic Time & Dating Principles**

**How long will we be learning this?**

* ~ 2 weeks

**By the end of this unit you should be able to:**

* Describe methods of relative dating techniques
* Explain the law of uniformitarianism
* Describe methods of radiometric dating
* Explain that fossils are found in sedimentary rocks and the conditions that favor fossil preservation
* Identify and describe different types of fossils and determine their relative and absolute age
* Calculate the amount of parent nuclei left in a sample using half life
* Explain problems that could occur from radiometric dating

**This is the vocabulary you should know:**

|  |  |  |  |
| --- | --- | --- | --- |
| Stratigraphy | Law of Superposition | Principle of Original Horizontality | Faunal Succession |
| Cross-Cutting | Inclusions | Unconformitiy | Disconformity |
| Angular Unconformity | Nonconformity | Correlation | Uniformitarianism |
| Radioactivity | Parent nuclei | Daughter nuclei | Half-life |
| Radiometric dating | Radiocarbon dating | Fossils | Unaltered remains |
| Altered remains | Molds | Casts | Amber |
| Carbonization | Petrification | Indirect evidence | Index fossil |

**Geology Learning Goals**

**Unit 6: Earth’s Geologic History**

**How long will we be learning this?**

* ~3 weeks

**By the end of this unit you should be able to:**

* Describe how scientists estimate the age of the earth with radiometric techniques
* Construct a geologic time scale that illustrates the evolution of earth and the history of life
* Explain the structure of the geologic time scale and what each major eon and era means
* Explain the major geologic events and life forms present within each of the major time areas: Precambrian, Early Paleozoic, Late Paleozoic, Mesozoic, Cenozoic
* Describe major events through earth’s history that have happened in New Mexico (Shiprock, Rocky Mountain formation, natural resource deposits)

**This is the vocabulary you should know:**

|  |  |  |  |
| --- | --- | --- | --- |
| Geologic time scale | Eon | Era | Period |
| Epoch | Precambrian | Phanerozoic | Paleozoic |
| Mesozoic | Cenozoic | Stromatolite | Gondwana |
| Laurasia | Trilobite | Cephalopod | Angiosperm |
| Gymnosperm | Tertiary | Quaternary |  |
|  |  |  |  |
|  |  |  |  |

**Geology Learning Goals**

**Unit 7: Earth’s Resources**

**How long will we be learning this?**

* ~ 2 weeks

**By the end of this unit you should be able to:**

* Compare and Contrast nonrenewable energy sources
* Compare and contrast renewable energy sources
* Analyze the past and present use of energy resources
* Predict the future trends in use of energy resources
* Research local, state, and national legislation & information regarding the protection of resources & methods for waste reduction, recycling, and disposal
* Apply case studies to relate land, water, and air pollution to human health issues

**This is the vocabulary you should know:**

|  |  |  |  |
| --- | --- | --- | --- |
| Renewable | Nonrenewable | Fossil fuel | Bitumen |
| Peat | Lignite | Anthracite | Oil trap |
| Tar sand | Oil shale | Ore  | Placer deposit |
| Turbine | Hydroelectric | Geothermal | Conservation |
| Clean water act | Clean air act | Safe Drinking Water Act | Point source pollution |
| Nonpoint source pollution | Global warming | Chlorofluorocarbon | Compost |
| Recycling |  |  |  |

**Geology Learning Goals**

**Unit 8: Weather**

**How long will we be learning this?**

* ~ 3.5 weeks

**By the end of this unit you should be able to:**

* Compare and contrast the composition of the atmosphere and its layers
* Identify different ways the atmosphere is heated and factors that affect temperature
* Identify and differentiate between types of precipitation, clouds, and how they are formed
* Describe patterns in weather systems as related to the transfer of energy
* Explain the differences between climate and weather, predict weather, and identify symbols associated with weather
* Construct materials, monitor, and analyze weather data
* Use Microsoft Excel to construct graphs from data

**This is the vocabulary you should know:**

|  |  |  |  |
| --- | --- | --- | --- |
| Ozone | Troposphere | Greenhouse effect | Stratosphere |
| Mesosphere | Ionosophere | Thermosphere | Exosphere |
| Ionosphere | Magnetosphere | Aurora | Conduction |
| Radiation | Convection | Scattering | Reflection |
| Absorption | Albedo | Isotherms | Isobars |
| Cloud | Latent heat | Sublimation | Deposition |
| Saturation | Humidity | Relative humidity | Dew point |
| Adiabatic rate | Orographic lifting | Environmental lapse rate | Cirrus |
| Cumulus | Stratus | -nimbo | -alto |
| Fog | Front | Air pressure | Barometer |
| Psychrometer | Hygrometer | Wind | Coriolis effect |
| Jet streams | Low pressure | High pressure | Cyclone |
| Anticyclone | Westerlies | Polar easterlies | Polar front |
| Monsoon | Prevailing wind | Anemometer | El Nino |
| La Nina | Weather | Climate | Warm front |
| Cold front | Stationary front | Occluded front | Air mass |
| Thunderstorm | Hurricane | Tornado | Fujita Scale |
| Saffir-Simpson Scale |  |  |  |