

National Park Geology

Themes matrix for teaching geology with National Park examples

Geologic Themes	Related Earth Systems	NPS Units	Earth Science Concepts	National Science Education Standards - Fundamental Concepts
Basin and Range	<ul style="list-style-type: none"> • Topography • Climate • Water • Plants • Animals • People 	6	<ul style="list-style-type: none"> • Earth structure • Extensional forces • Faulting • Plate tectonics • Mountain building 	<ul style="list-style-type: none"> • Energy in the earth system • Motions and forces • Evidence, models, and organization
Caves and Karst	<ul style="list-style-type: none"> • Topography • Water • Plants • Animals • People 	79	<ul style="list-style-type: none"> • The rock cycle • Chemical weathering • Groundwater • Hydrologic cycle • Volcanism (lava tubes) • Sedimentation • Faulting and Jointing • Rocks and Minerals 	<ul style="list-style-type: none"> • Geochemical cycles • Chemical reactions • Structure and properties of matter • Environmental quality • Science as a human endeavor
Colorado Plateau	<ul style="list-style-type: none"> • Topography • Climate • Plants • Animals • People 	15	<ul style="list-style-type: none"> • Geological time • The rock cycle • Lithification • Stratigraphy • Physical weathering • Erosion and sedimentation 	<ul style="list-style-type: none"> • Origin and evolution of the earth system • Systems, order, and organization
Fossils	<ul style="list-style-type: none"> • Topography • Climate • Plants • Animals • People 	148	<ul style="list-style-type: none"> • Geological time • Process of fossilization • Relative age determinations • Stratigraphy • Absolute age determinations • Paleo environments 	<ul style="list-style-type: none"> • Origin and evolution of the earth system • Biological evolution • Nature of scientific knowledge • Systems, order, and organization
Glaciers (and glacial landforms)	<ul style="list-style-type: none"> • Topography • Climate • Water 	34	<ul style="list-style-type: none"> • The rock cycle • Physical weathering • Hydrologic cycle 	<ul style="list-style-type: none"> • Origin and evolution of the earth system • Energy in the earth system

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	<ul style="list-style-type: none"> • Soils 		<ul style="list-style-type: none"> • Erosion and deposition • Glacial geomorphology 	<ul style="list-style-type: none"> • Motions and forces
Hot Springs / Geothermal	<ul style="list-style-type: none"> • Topography • Water • Soils • Plants • Animals • People 	30	<ul style="list-style-type: none"> • Earth structure • Geothermal systems • Groundwater 	<ul style="list-style-type: none"> • Origin and evolution of the earth system • Energy in the earth system • Motions and forces • Natural Resources
Human Use	<ul style="list-style-type: none"> • Topography • Climate • Water • People 	12	<ul style="list-style-type: none"> • Rocks and minerals • Landforms 	<ul style="list-style-type: none"> • Natural Resources • Environmental quality • Science as a human endeavor
Mountain Building	<ul style="list-style-type: none"> • Topography • Climate • Water • Soils • Plants • Animals • People 	37	<ul style="list-style-type: none"> • Geological time • Earth structure • Plate tectonics • Forces causing compression and extension • Folding and faulting • Volcanism • The rock cycle 	<ul style="list-style-type: none"> • Origin and evolution of the earth system • Energy in the earth system • Motions and forces
Oldest Rocks	<ul style="list-style-type: none"> • Topography • Climate • Water • Soils • Plants • Animals • People 	14	<ul style="list-style-type: none"> • Geological time • Earth structure • Paleomagnetism • The rock cycle 	<ul style="list-style-type: none"> • Origin and evolution of the earth system • Structure and properties of matter
Plate Tectonics	<ul style="list-style-type: none"> • Topography • Climate • Water • People 	8	<ul style="list-style-type: none"> • Earth structure • The rock cycle • Geological time • Active plate boundaries • Measuring and locating earthquakes 	<ul style="list-style-type: none"> • Evidence, models, and explanations • Origin and evolution of the earth system • Energy in the earth system • Interactions of energy and matter • Motions and forces

Geologic Themes	Related Earth Systems	NPS Units	Earth Science Concepts	National Science Education Standards - Fundamental Concepts
				<ul style="list-style-type: none"> Natural and human-induced hazards
River Systems	<ul style="list-style-type: none"> Topography Climate Water Soils Plants Animals People 	20++	<ul style="list-style-type: none"> The rock cycle Hydrologic cycle Physical and chemical weathering Fluvial Geomorphology Erosion and deposition 	<ul style="list-style-type: none"> Motions and forces Natural Resources Systems, order, and organization Environmental quality
Sand Dune	<ul style="list-style-type: none"> Topography Climate Water Soils Plants Animals People 	22	<ul style="list-style-type: none"> The rock cycle Hydrologic cycle Physical weathering Dune geomorphology Eolian processes 	<ul style="list-style-type: none"> Energy in the earth system Motions and forces Structure and properties of matter
Shoreline Geology	<ul style="list-style-type: none"> Topography Climate Water Soils Plants Animals People 	68	<ul style="list-style-type: none"> The rock cycle Hydrologic cycle Physical and Chemical weathering Eolian processes Shoreline geomorphology Erosion and deposition Sea-level variations 	<ul style="list-style-type: none"> Origin and evolution of the earth system Energy in the earth system Motions and forces Science and technology in local, national, and global challenges
Volcanoes	<ul style="list-style-type: none"> Topography Climate Water Soils Plants Animals People 	33	<ul style="list-style-type: none"> Earth structure The rock cycle Mantle hotspots Subduction-related volcanoes Active plate boundaries Measuring and locating earthquakes 	<ul style="list-style-type: none"> Origin and evolution of the earth system Energy in the earth system Interactions of energy and matter Origin and evolution of the universe Natural and human-induced hazards