Geologic Time Scale for Kansas

Eon	Era	Period	Epoch	Kansas Environment and Geology	
Phanerozoic Eon	Cenozoic	Quaternary	Holocene	Pleistocene glaciers reached northeast Kansas at least twice, leaving behind unsorted clay, sand, gravel, and quartzite boulders (still found on the surface) carried from Minnesota and other states. Cycles of incision and deposition by streams occurred. Wind deposited loess (fine silt). Volcanic ash blew in from west. Forests decreased and grassland increased in Holocene. Sand dunes formed by wind in western and central Kansas are now mostly inactive (covered with vegetation).	11,700 ya
			Pleistocene		2.6 mya
		Neogene	Pliocene	Silt, sand, and gravel eroded from uplifting Rocky Mountains were carried by streams into western and central Kansas and formed the porous Ogallala Formation, a major source of groundwater. Volcanic ash was blown in from west.	5.3 mya
			Miocene		23 mya
		Paleogene	Oligocene	Paleogene rocks have not been found in Kansas.	
			Eocene		
			Paleocene		66 mya
	Mesozoic	Cretaceous		Seas covered western and central Kansas late. Fossil-rich marine rocks at the surface include Greenhorn Limestone in central Kansas and Niobrara Chalk to the west. Dakota sandstone formed from delta-type deposits in central Kansas. Fence-post limestone bed (Greenhorn Limestone) was used to build fences and buildings because wood was sparse. Igneous kimberlite pipes erupted toward the surface in eastern Kansas.	145 mya
		Jurassic		Terrestrial shale and sandstone deposits are found in western Kansas subsurface.	201 mya
		Triassic		Triassic rocks have not been found in Kansas.	252 mya
	Paleozoic	Permian		Cycles of shallow seas, tidal flats, and dry land resulted in deposits of limestone, shale, sandstone, dolomite, gypsum, and chert. Permian rocks are found at the surface in the Flint Hills and south-central Kansas Red Hills. Oil and gas are produced from Permian rocks. Salt left when seas dried is mined underground in central Kansas.	299 mya
		Carboniferous	Pennsylvanian subperiod	Cycles of shallow seas, swamps, and river channels resulted in deposits of limestone, sandstone, shale, and coal found at the surface in eastern Kansas. Folding and faulting created the Central Kansas Uplift, a ridge now deeply buried. Oil, gas, and coal are produced from Pennsylvanian rock layers.	323 mya
			Mississippian subperiod	Cycles of shallow seas and dry land resulted in deposits of limestone, sandstone, shale, and chert. Found at surface only in far southeast Kansas. Oil and gas are produced from Mississippian rocks. Lead and zinc were once mined in southeast Kansas.	359 mya
		Devonian		Seas covered Kansas during part of period. Devonian limestone, shale, dolomite, sandstone, and chert are found in the subsurface. Oil and gas are produced from Devonian rock.	419 mya
		Silurian		Seas covered Kansas during part of period. Silurian limestone, shale, dolomite, sandstone, and chert are found in the subsurface. Oil and gas are produced from Silurian rock.	443 mya
		Ordovician		Seas covered Kansas during part of period. Dolomite, limestone, sandstone, shale, and chert from period are found in the subsurface. Oil and gas are produced from Ordovician rock.	485 mya
		Cambrian		Early erosion was followed by shallow seas in Kansas. Cambrian dolomite, sandstone, limestone, and shale are found in the subsurface.	541 mya
Proterozoic Eon				This time is informally called the Precambrian. Proterozoic igneous and metamorphic rocks are found deep in subsurface, but no Archean or Hadean rocks are known in Kansas. The midcontinent rift nearly split the North American plate apart about 1.1 bya but stopped short. A ridge created by the rift is underground in east-central Kansas.	2.5 bya
Archean Eon					4 bya
Hadean (informal)					4.6 bya

Reference: International Stratigraphic Chart, 2015, International Commission on Stratigraphy.

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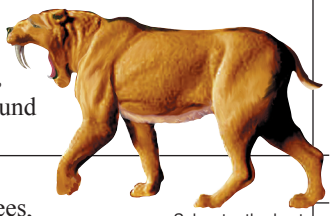
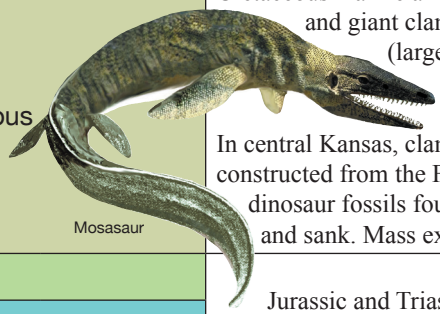
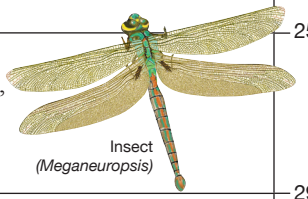
ya = years ago
mya = million years ago
bya = billion years ago

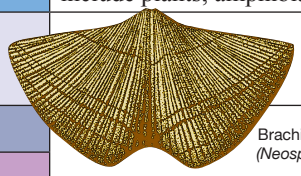
Common Fossils in Kansas

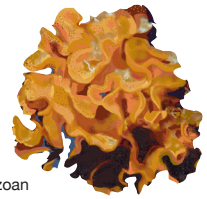
Eon	Era	Period	Epoch	Kansas Fossils	
Phanerozoic Eon	Cenozoic	Quaternary	Holocene	A variety of large mammals—including mammoths, camels, saber-tooth cats, and horses—lived in Kansas during the Pleistocene. Most died off during a mass extinction 9,000–12,000 years ago. Bison bones and human artifacts, dating back 11,000 years, have been found together. In the Holocene, grasslands became more prevalent and species found today began to dominate.	11,700 ya
			Pleistocene		
		Neogene	Pliocene	Neogene animals and plants include rhinoceros, tapirs, horses, kangaroo rats, salamanders, elm trees, hackberry trees, and grasses. Trace fossils of animal burrows and ant nests have been found.	2.6 mya
			Miocene		5.3 mya
		Paleogene	Oligocene	Paleogene rocks have not been found in Kansas.	23 mya
			Eocene		
			Paleocene		66 mya
	Mesozoic	Cretaceous		Cretaceous marine animal fossils include squids, ammonoids, sharks, crinoids, and giant clams. World-class fossils of plesiosaurs and mosasaurs (large swimming reptiles) and pteranodons (large gliding reptiles) have been found in western Kansas. Leaf fossils have been found in the Dakota sandstone. In central Kansas, clam fossils are common in fences and building walls constructed from the Fence-post limestone bed. The few incomplete dinosaur fossils found are mostly from animals that died, floated out to sea, and sank. Mass extinction occurred at end of period.	145 mya
		Jurassic		Jurassic and Triassic fossils have not been found in Kansas.	201 mya
		Triassic			252 mya
	Paleozoic	Permian		Permian marine animal fossils include mollusks, brachiopods, bryozoans, crinoids, coral, sharks' teeth, and one-cell fusilinids. Terrestrial leaf and insect fossils have been found. Mass extinction occurred at end of period.	299 mya
		Carboniferous: Pennsylvanian subperiod		Pennsylvanian marine animal fossils include brachiopods, bryozoans, coral, crinoids, mollusks, and one-cell fusilinids. Terrestrial, or land, fossils include plants, amphibians, and early reptiles.	323 mya
		Carboniferous: Mississippian subperiod		Mississippian marine fossils include crinoids, brachiopods, bryozoans, and mollusks.	359 mya
		Devonian			419 mya
		Silurian			443 mya
		Ordovician			485 mya
		Cambrian			541 mya
Proterozoic Eon				Microscopic fossils and some small marine fossils from the Cambrian through the Devonian periods have been found in rock cores that were brought up from the subsurface during drilling for oil and natural gas. No fossils from before the Cambrian Period have been found in Kansas.	2.5 bya
Archean Eon					4 bya
Hadean (informal)					4.6 bya


Saber-toothed cat (*Smilodon*)


Mosasaur


Insect (*Meganeuropsis*)


Brachiopod (*Neospirifer*)


Bryozoan

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