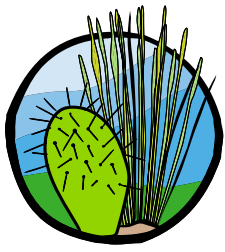


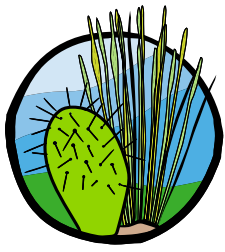
# Adaptations of Animals in Grasslands

Type of Adaptation	Adaptive Trait	Additional Description	Advantage	Examples
Behavioural	Burrowing behaviour	-	Go underground to avoid temperature extremes (heat of summer days and/or winter cold and snow)	Coyote, badgers, burrowing owls, gophers, marmots
	Nocturnal behaviour	May have specialized senses for perceiving predators and prey at night	Avoid extreme heat of daytime	Rattlesnake, many rodents, owls (but not burrowing owls)
	Behaviour to avoid temperature extremes	Seek microclimates	Avoid daily temperature fluctuations (heat of summer days and cold nights)	Many examples, such as tiger salamanders hunt in the shade during the day and stay warm at night by resting on rocks that retain the heat from the day
	Nesting behaviour	With few trees to nest in, some birds nest on the ground, relying on camouflage and the cover of big bunchgrass plants to protect them	Able to hide nests, eggs, and chicks from predators	Long-billed curlews, meadowlarks, vesper sparrows, nighthawks
	Migration	Migrate from grasslands in winter to warmer locales	Avoid seasonal temperature extremes; have adequate food	Bats, hawks, monarch butterflies
	Migration	Migrate to grasslands in winter from higher elevations or latitudes	Avoid high snow pack and extreme winter conditions; have adequate food	Elk, bighorn sheep, gyrfalcon, snowy owl



# Adaptations of Animals in Grasslands

Type of Adaptation	Adaptive Trait	Additional Description	Advantage	Examples
Physiological/ Body Systems	Hibernation/ Torpor	-	Avoid winter snow, cold temperatures, and lack of food	Snakes, lizards, amphibians, some invertebrates, marmots, pocket mice, ground squirrels
	Specialized physiology- do not need to drink	Concentrate urine, obtain water from food	Survive drought conditions	Pocket mice
	Specialized physiology- to cool down	Evaporative cooling mechanism	Tolerate heat, sunlight and drought	Cicadas
	Cold blooded	Energized and warmed by the sun and heat	Tolerate heat and sunlight	Sunloving, cold blooded organisms including many invertebrates such as grasshoppers, spiders, robberflies, butterflies; Lizards and snakes
	Specialized digestion	Ruminants have a special part of stomach called rumen where bacteria help break down plants. Rabbits have moist and dry fecal pellets (they eat the moist ones).	Able to digest grasses; absorb nutrients and retain water	Deer, elk, sheep, cattle (ruminants-chew their cud); rabbits (eat their fecal pellets)
Physical/ Structural	Camouflage	With few places to hide above ground, some animals blend in well with the shrubs and grasses	Able to hide from predators in areas with little cover	Ground mantis, rodents, many grassland birds
	Broad, flat teeth	-	Feed on grasses	Ungulates (deer, elk, sheep)
	Cheek pockets	-	Collect and store seeds for winter	Pocket mice
	Physical features to assist in digging	Sharp, curved front claws; strong stocky legs	Assists in digging to create burrows for shelter or to hunt for underground prey	Badger, ground squirrel, gophers, marmots



# Adaptations of Animals in Grasslands

Part	Adaptive Trait	Description	Advantage	Examples
Roots	Taproots	Long taproots go deep below the soil surface to obtain moisture	Drought tolerance	Arrow-leaved balsamroot, sagebrush, antelope-brush, rabbit brush
Roots	Shallow, fibrous roots	Network of fibrous root system to soak up small amounts of moisture from soil surface	Drought tolerance	Bunchgrasses
Roots	Bulbs; growth only during favourable conditions	Bulbs store food for the plant until conditions are moist and then the plant can sprout and grow above the ground	Energy storage, drought avoidance	Mariposa lily
Leaves	Curve inwards	Plant leaves curve inwards to funnel water droplets towards roots	Drought tolerance	Bunchgrasses
Leaves, twigs	Hairy	Hairy leaves and twigs help protect from temperature extremes and from drying winds	Protection from drying winds, extreme temperatures	Sagebrush, arrow-leaved balsamroot
Leaves	White	White hairs reflect sunlight	Protection from heat and sun	Sagebrush
Nodes	Apical meristem	Regrowth after disturbance from apical meristems (nodes) below plant tips	Tolerance to fire and grazing	Grasses
Modified leaves	Spines	Spines protect watery tissue from herbivores	Water storage and protection	Prickly pear cactus
Leaves, stems	Succulent, waxy surface	Succulents store water in tissues. Waxy surface prevents evaporation.	Water storage and conservation	Prickly pear cactus
Growing season	Short and fast	Short growing season from late fall to early spring; dormancy during summer drought	Drought avoidance	Bunchgrasses
Soil crust	Symbiotic relationship between algae, fungi, and bacteria	Soil crusts capture moisture, prevent wind and water erosion, and provide nitrogen and other nutrients to grassland plants	Tolerate drought, wind, heavy rain. Increase nutrient cycling	Microbiotic soil crust