

Amphibian Characteristics

no of legs	4 (2 pairs)
skin type	thin and moist
Temp. Regulation	ectothermic (body temp depends on external sources such as sunlight)
Heart chambers	3 (2 atria, 1 ventricle)

Amphibian Systems

Excretion	kidneys; ammonia and urea are formed in the liver
Cloaca	a chamber that collects fecal matter, urine, and gametes
Respiration (larvae)	gills
Respiration (adults)	skin
Nervous system	Complex
Nictitating membrane	a membrane that is drawn over the eye to prevent dryness or when swimming
Reproduction	sexual, and external fertilization

Amphibian Classification

Anura	no tail, live close to water (frogs and toads)
Caudata	have long bodies, a neck, and a tail (salamanders and newts)
Gymnophiona	limbless worm like organisms (caecilia)
difference between frogs and toads	toads are poisonous

Bird Classification

number of groups	27	
Passeriformes	3 forward toes, 1 backward	crows and quails
sphenisciformes	paddle like wings for swimming	penguins
struthioniformes	flightless with small wings	ostrich and emu
Anseriformes	webbed feet	ducks and geese

Vertebrate Characteristics

Vertebral Column	replaces the notochord, and protects the spinal cord. Is flexible and strong
Neural Crest	a group of temporary cells that arise in embryological development, and give rise to important cell types

Bird Beak Types

Daggerlike	snowy eagrets
Needlelike	hummingbirds
Curved	falcon
Pouchlike	pelican

Birds

Temp regulation	endotherms
teeth	absent
heart chambers	4
respiration	Air sacs

Bird Systems

Digestive system	esophagus - crop - stomach - gizzard - intestines
Flight Adaptations	feathers - no bladder - high temp - light skeleton - large chest muscles
Feathers	made of keratin
Contour feathers	used for flight



Bird Systems (cont)

Down feathers	provide insulation
Reproduction	sexual, internal; they incubate their eggs for optimal conditions

Traditional Mammal Classes

Cetacea	dolphins, whales
perissodactyla	(odd numbered toes) zebras, horses
Aritodactyla	(even number of toes) cows, gazelles
Chiroptera	(flying mammals) Bats
Sirenia	(slow moving) eared seals, duogongs
Xenartha	armadillos, sloths
Lagomorpha	rabbits

Reptile Characteristics

Skin Type	dry scaly skin
Respiration	Lungs
Heart Chambers	typically 3, crocodile has 4
Temp regulation	ectothermic

Reptile Systems

Excretion	kidneys; filtrate then collects in the cloaca, and is released as uric acid	
Smell	snakes extend their tongue to smell	
Jacobson's Organ	a sac-like structure in the roof of the mouth that allows snakes to detect odor	
Hearing	tympanic membrane - jawbones detect vibrations	
Reproduction	sexual and internal;	
egg type	amniotic eggs	

snakes and lizards allow eggs to develop within their bodies before laying them

Mammal Characteristics

Hair	made of keratin	
Mammary Glands	produce Milk	
Metabolic Rate	high, to maintain constant body temp	
Digestion	teeth and a specialized digestive system	
Respiration	Lungs - Diaphragm (membrane under lungs)	
Heart Chambers	4	
Body temp	endothermic	
overcome increase in temp by	sweating - panting	
Reproduction	internal, occurs in uterus that also encloses the placenta	
Brain	highly complex; Cerebral cortex is the most complex part, and the larger the organism, the larger the cerebral cortex	

Reptile Classification

Squamata	lizards - snakes	
Crocodylia	alligators and crocodiles	
testudinata	turtles and tortoises (have a carapace)	
Sphenodontia	tuataras	

Mammals Classification (Based On Reproduction)

Monotremes	egg laying mammals	platypus, echnidas
Marsupials	have a nipple covering pouch	kangaroos, koalas, opossum, wallabies
Placentals	Give birth, have a placenta	humans, monkeys, whales, bats



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Mammals Classification (Based On Nutrition)

insect-ivores	eat insects	moles, hedgehogs, shrews
Carnivores	meat eaters	lions, wolves
herbivores	ruminants (have a rumen that breaks down cellulose) - Livestock	nonruminants (cellulose is broken down in the cecum) - Rabbits
Omnivores	eat plants and animals	bears

Fish Characteristics

vertebral coloumn	present
Jaws	present, and are used for predation and protection
Fins	allow fish to swim
scales	come in 4 types

Fish Body Systems

Respiration	occurs in gills
Circulatory System	closed system
Heart chambers	2
Swim bladder / Gas Bladder	an internal organ filled with gas that allows most bony fish to swim at different depths
Feeding	Filter feeders - predators - scavengers (feed off corpses)
Nervous System	similar to other vertebrates
Lateral Line organ	a sensory organ that allows fish to detect changes in the water
Reproduction	Spawning - internal fertilization
Spawning	when gametes are released in the water (external)
Classification	bony fish (tuna) - cartilaginous fish (Sharks) - jawless fish (parasitic lamprey)

Fish Scales

Ctenoid	bass
Cycloid	salmon & sardines
Ganoid	Gar
Placoid	Sharks



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