

Ch. 12 Fishes, Amphibians, and Reptiles

What do you mean? Is it because I believe in catch and release?

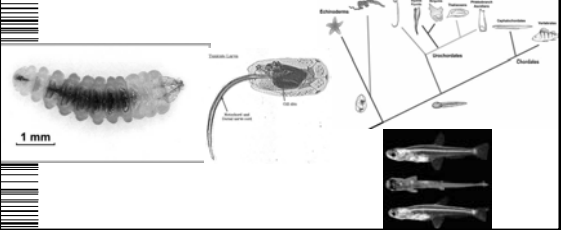


There are a lot of happy fish up here in the north state now that you have moved here, Rob.

Yeah, you have to catch the fish first.

Section 1 Evolution of Vertebrates

Chordates = at some point in their lives have a notocord (nerve cord) – notocord is a flexible rod that supports the animal's back – some have notocord all their lives, some as a larva, some have their notocord replaced by a backbone (can be made of bone or cartilage) also have a nerve cord



Ectotherm = get body temperature from environment – ex. Fish, amphibians, and reptiles – Endotherm = generate their own body heat – have fur, hair, sweat glands, feathers to maintain their temp. – can live in a greater variety of places

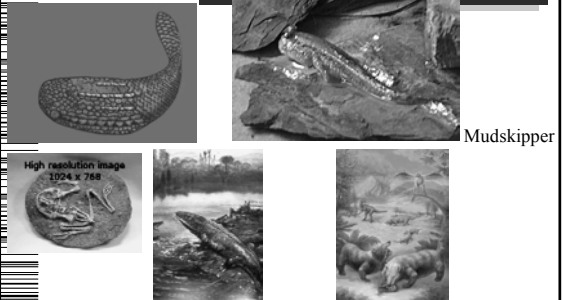
Ectotherm



Endotherm



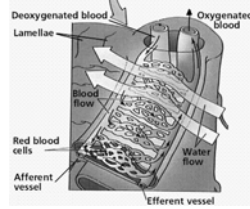
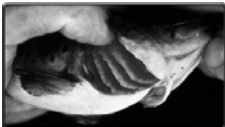
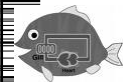
Early Vertebrates were fish – appeared 530 million years ago – amphibians appeared 380 million years ago – reptiles 320 million years ago – mammals 220 million years ago – birds 150 million years ago



Mudskipper

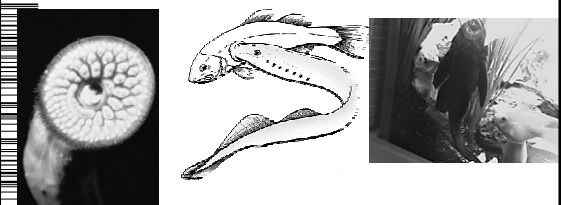
Section 2 Fish

ectotherms – have fins, gills, and scales – largest group of vertebrates – 1/2 of all vertebrates are fish – breath by opening their mouth and passing water over their gills – diffusion allows oxygen to get into the blood and carbon dioxide back into the water – have a closed circulatory system – most reproduce externally – some reproduce internally -



3 major groups of fish = jawless, cartilaginous, and bony fish

Jawless fish were the earliest vertebrates, have no scales, skeletons made of cartilage, and do not have pairs of fins – mouths are made for scraping, stabbing and sucking – ex. Hag fish, and Lampreys



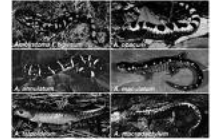
Frogs and Toads

Frogs' skin is moist and smooth – toads' skin is drier and bumpy – many toads have bumps behind their eyes that contain poison – tadpoles are herbivores the frog/toad is predator



Salamanders

have tails as adults – legs not adapted for jumping – will stalk and ambush their prey – some live in the water all their lives and some only in early life – some are lungless and breath only through their skin – these salamanders do not lay eggs in the water – lay eggs in moist places and offspring look like miniature adults



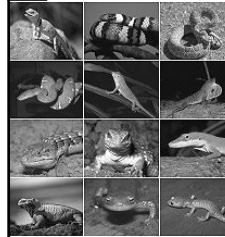
Amphibians populations are decreasing all over the world – habitat loss and pollution are major causes



Play the Fish and Amphibian MPEG

Section 4 Reptiles

ectotherms – have lungs and scaly skin – ex. Snakes, lizards, turtles, alligators – were the dominant for 160 million years – eggs, skin, and kidneys adapted to conserve water - eggs are fertilized internally while still in the female

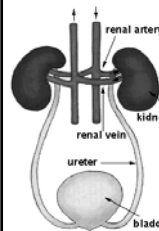


eggs have a shell and membrane for protection and to keep from drying out – shells feel leathery – tiny holes allow oxygen in and carbon dioxide out – eggs are laid on dry land – 3 membranes – 1 holds the yolk (food for embryo), 1 holds the wastes, and 1 holds the liquid that surrounds the embryo

61 A Reptile Egg



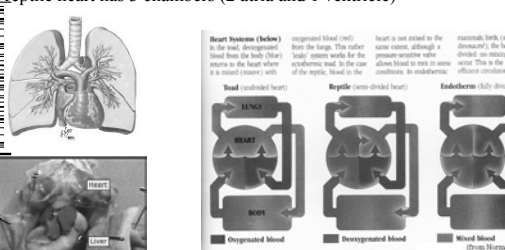
rough scaly skin protects the reptile and holds in water – kidneys filter the blood and keep as much water in as possible – kidneys make urine = watery fluid produced by the kidneys that from blood filtration made of urea and other waste products



How the kidney works



When breathing air is brought into lungs and oxygen diffuses across lung tissue – carbon dioxide diffuses back across – blood is pumped to go by the lungs to get the oxygen and to release the carbon dioxide – reptile heart has 3 chambers (2 atria and 1 ventricle) -



Heart Systems (below)

oxygenated blood (red) from the lungs. This oxygenated blood from the body (dark) returns to the heart where it is mixed (purple) with deoxygenated blood (red) from the body. This mixture of oxygenated and deoxygenated blood is pumped to the rest of the body. In the case of the reptile, blood in the heart is not mixed in the same extent, although a pressure-separate valve allows blood to mix in some conditions. In endotherms, the heart is fully divided into two atria and two ventricles, the heart is fully divided into oxygenated and deoxygenated blood. This is the most efficient circulatory system.

Reptile (three-chambered heart)


Amphibian (three-chambered heart)

Endotherm (four-chambered heart)

Legend: ■ Oxygenated blood ■ Deoxygenated blood ■ Mixed blood (From Hartman, 1987)

Lizards


most live in warm areas – ectotherms – shed skin – have four legs – can be herbivores or carnivores -



Basilisk Lizard
AKA “Jesus Christ Lizard”

Snakes

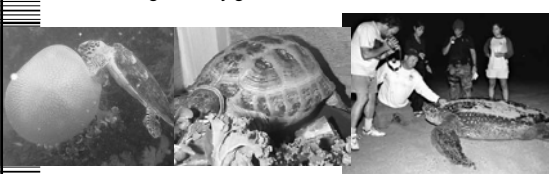
no legs – no eyelids – no external ears – most have only one lung – all are carnivores – bones of the jaw and skull can move to allow large prey into their mouths – hunt prey in a variety of ways = jumping and wrapping around, by biting with venom, just biting -



Snakes

Turtles

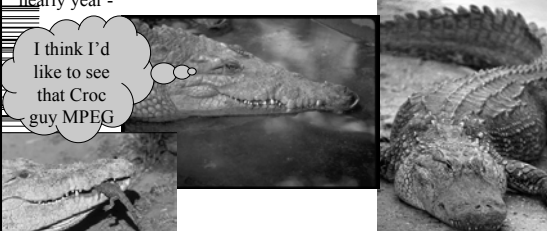
body is covered by a protective shell – there are soft shelled turtles (found in water) and hard shelled turtles – can be carnivores or herbivores – food very diverse too – ex. Jelly fish for Leather back turtles and Cacti for Galapagos tortoises - In general, a turtle lives in or near the water and has adapted to swim by holding their breath underwater - A tortoise lives in an arid region, comfortable with storing water and walking on sandy ground.



Alligators and Crocodiles

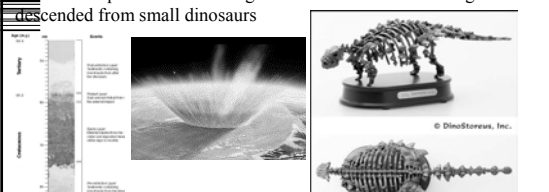
alligators have broad rounded snouts with a few teeth visible – crocs have pointed snouts with lots of teeth hanging out – spend time between sun and water – ectotherms – mostly hunt at night – use their tail to swim – care for their eggs and newly hatched babies for nearly year -

I think I'd like to see that Croc guy MPEG



Extinct Reptiles – Dinosaurs

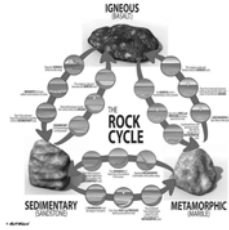
from 225 million years ago to 65 million years ago – may have been endothermic – legs were located right under them which allowed for easy walking – most of today's reptiles have legs on their sides – major climate change probably killed the dinosaurs – meteor could of hit earth sending up a huge amount of dust, blocking the sun – volcanic eruptions and dust might of blocked sun – birds might be descended from small dinosaurs



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Section 5 Vertebrate History In Rocks

fossil = hardened remains or other evidence of a living thing that existed – found only in **sedimentary rock = particles of other rocks** and minerals pressed together – paleontologist = scientist who study extinct organisms, examine fossils, and make comparisons to present day organisms



top layers of sediment are usually younger than bottom layers – however the earth might move, tilt, erode, etc. – can not radioactive date sedimentary rocks because tells how old the individual sediments are and not the fossil or newer pressed together rock – can use on the living tissue left over from the fossil – fossil record gives a lot of evidence about when animal groups were on earth and how they might be related to one another

