

Vertebrates

Tetrapods

Class Amphibia (Amphibians)

Transition from water to land

- Water content of body
- Oxygen concentration
- Density and support
- Climatic fluctuation (temperature)

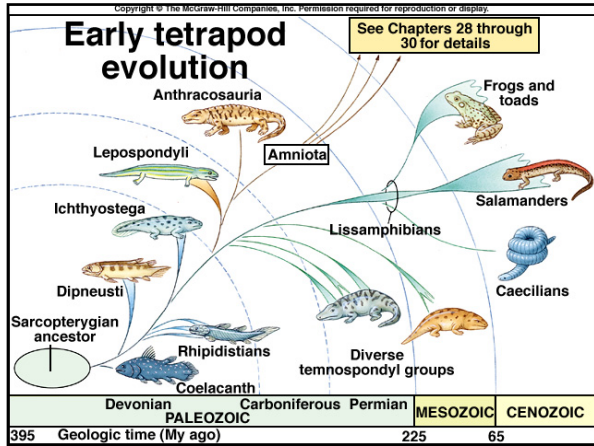
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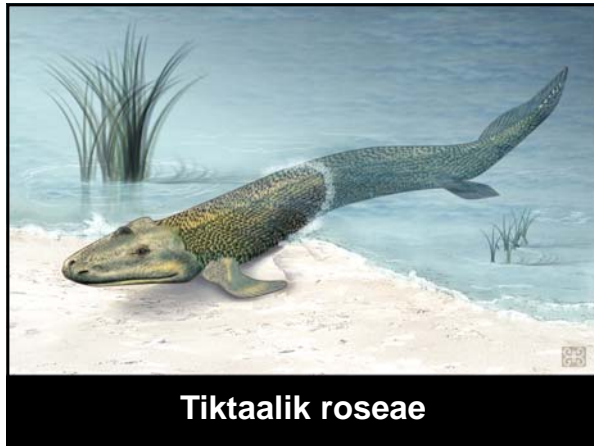
Class Amphibia (Amphibians)

Early tetrapods and evolution


- Devonian period (400 MY ago)
- Arose from **Sarcopterygian** ancestor
- Evolution of **vascularized lungs** and powerful jointed limbs
- Evolution of land movement? Seasonal droughts, predation refuge, terrestrial food sources?








Tiktaalik roseae



Tiktaalik 'fins' had basic wrist bones and simple fingers, an indication that they were weight bearing



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Defining traits of living amphibians

- > 4 limbs with skeletal frame
- > Lungs and internal nostrils
- > Three-chambered heart
- > Ear, eyes, and nasal cavity modified for sensory reception in air
- > Smooth, moist skin
- > Metamorphosis



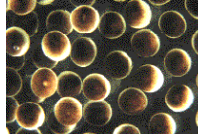

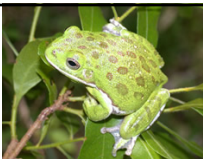
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Modern amphibians (3 orders)

- > Caecilians
- > Salamanders
- > Frogs and toads
- > About 4200 species
- > Ancestral condition involves metamorphosis from aquatic larva to terrestrial adult
- > Very dependent on water to avoid desiccation




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Frogs and toads

- No tail in adults, but present in larvae
- Specialized for jumping
- Dramatic changes during metamorphosis
- Males set up territories and use sound for courtship
- May be indicator species for environmental changes



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Frog form and function

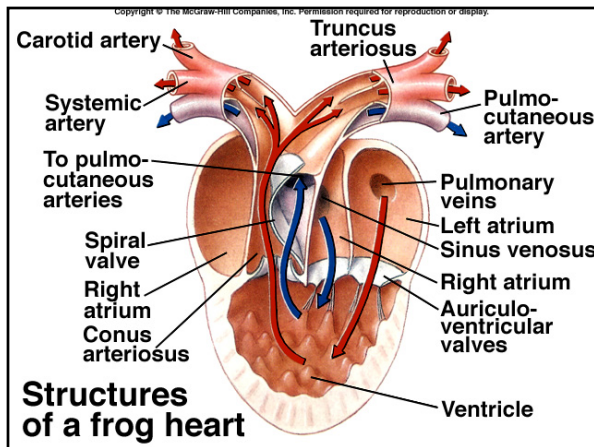
Respiration

- Skin, buccal cavity, lungs
- Positive-pressure breathers
- Vocal cords for sound production

Circulation

- Closed system
- 3-chambered heart
- Separate pulmonary and systemic circuits





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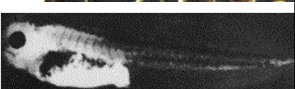
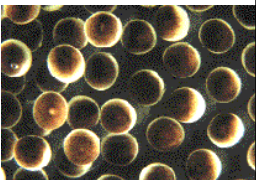

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Frog form and function

Reproduction

- External fertilization by **amplexus**
- Eggs layed in water
- Hindlegs appear first during metamorphosis
- Lungs develop, gills are **resorbed**



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Tadpole metamorphosis



Cleveland D. Hickman, Jr.

