

**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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**Vertebrates**

**Tetrapods**

**Class Amphibia (Amphibians)**

Early tetrapods and evolution

- Devonian period (400 MY ago)      **See Figs. 17.1-17.3 in text**
- Arose from Sarcopterygian ancestor
- Evolution of vascularized lungs and powerful jointed limbs
- Evolution of land movement? Seasonal droughts, predation refuge, terrestrial food sources?

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**Class Amphibia (Amphibians)**

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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**Vertebrates**

**Tetrapods**

**Class Amphibia (Amphibians)**

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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**Class Amphibia (Amphibians)**

**Caecilians**

- Limbless and tailless
- Mostly fossorial (burrowing) See Fig. 17.4 in text
- Tropical climates
- Small eyes or blind
- Sensory tentacle on head (unique among vertebrates)

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**Class Amphibia (Amphibians)**

**Salamanders**

- Tailed amphibians
- Generally 4 limbs See Figs. 17.5-17.9 in text
- All carnivores
- Considerable variation in modes of respiration and life history
- Common in North America

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**Class Amphibia (Amphibians)**

**Frogs and toads**

- No tail in adults, but present in larvae
- Specialized for jumping      **See Figs. 17.11-17.14 in text**
- Dramatic changes during metamorphosis
- Males set up territories and use sound for courtship
- May be indicator species for environmental changes

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**Class Amphibia (Amphibians)**

**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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**Tetrapods**

**Class Amphibia (Amphibians)**

**Frog form and function**

**Reproduction**

- External fertilization by amplexus
- Eggs layed in water      **See Figs. 17.15-17.16 in text**
- Hindlegs appear first during metamorphosis
- Lungs develop, gills are resorbed

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