Lesson 35 Amphibians

Key Words

amphibians: vertebrates that usually have gills and live in water when they are young, and have lungs and live on land as adults

mucus glands: glands in the skin that produce a slimy substance that keeps the skin from drying out

tadpole: immature stage of a frog

KEY IDEAS

Amphibians were the first vertebrates to adapt to life on land. When they are young, most amphibians have gills and live in water. As adults, most amphibians breathe through lungs and live on land.

Have you ever opened your eyes under water while swimming? If so, you know how irritated your eyes can get from the water. Now imagine being a frog. Frogs live most of their lives under water. But they need to be able to see where they're going. Frogs have special eyelids. These eyelids are clear so that the frog can see through them. Yet the lids cover the eyes to keep water from bothering them.

Like other amphibians, frogs are adapted to life both in and out of the water. **Amphibians** (am-FIHB-ee-uhnz) are vertebrates that usually have gills and live in water when they are young, and have lungs and live on land as adults. Amphibians include familiar animals such as frogs, toads, and salamanders.

Characteristics of Amphibians. Many characteristics of amphibians are adaptations to life on land. Most adult amphibians have internal lungs rather than gills. The lungs are kept moist by fluids inside the body. Another adaptation amphibians have are mucus glands in the skin. **Mucus glands** (MYOO-kuhs glandz) secrete a slimy substance called mucus that covers the skin and prevents water loss. The skin of amphibians is smooth and thin. Amphibians also have bony skeletons that are strong enough to support their weight. Most amphibians have two pairs of legs with clawless toes.

Amphibians are only partially adapted to life on land. For example, almost all amphibians must return to the water for at least part of their reproductive cycle. Most amphibians have webbed feet for swimming. Like fishes, amphibians have external fertilization and are ectothermic. Unlike fishes, adult amphibians have a heart with three chambers. Fish hearts have only two chambers.

1. **What is an adaptation of amphibians that prevents water loss?**

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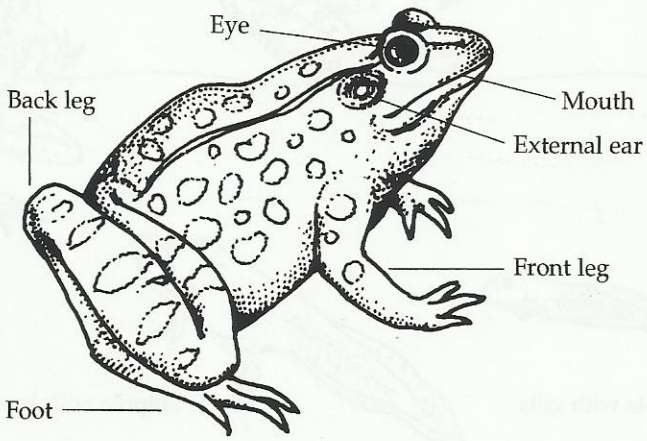
_____

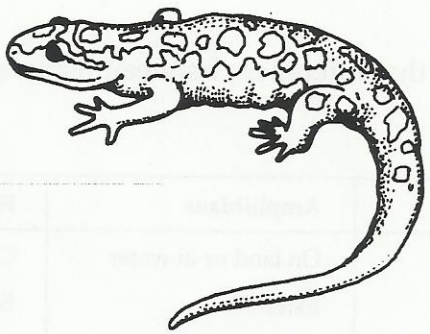
Classification of Amphibians. Most amphibians are classified into two groups. The first group is made up of amphibians without tails. These include frogs and toads. Frogs are the most common amphibians. They have short, wide bodies with two pairs of legs—small front legs and large, powerful back legs used for jumping. The back feet of frogs are large and webbed. Frogs also have large, protruding eyes that allow them to see above the water when they are swimming. Another feature of a frog is its large, external ears. See Fig. 35-1.

Fig. 35-1 Frog



The second group of amphibians has tails. Salamanders, shown in Fig. 35-2, are in this group. Salamanders live in moist places near water. They have two pairs of legs that stick straight out from the body.

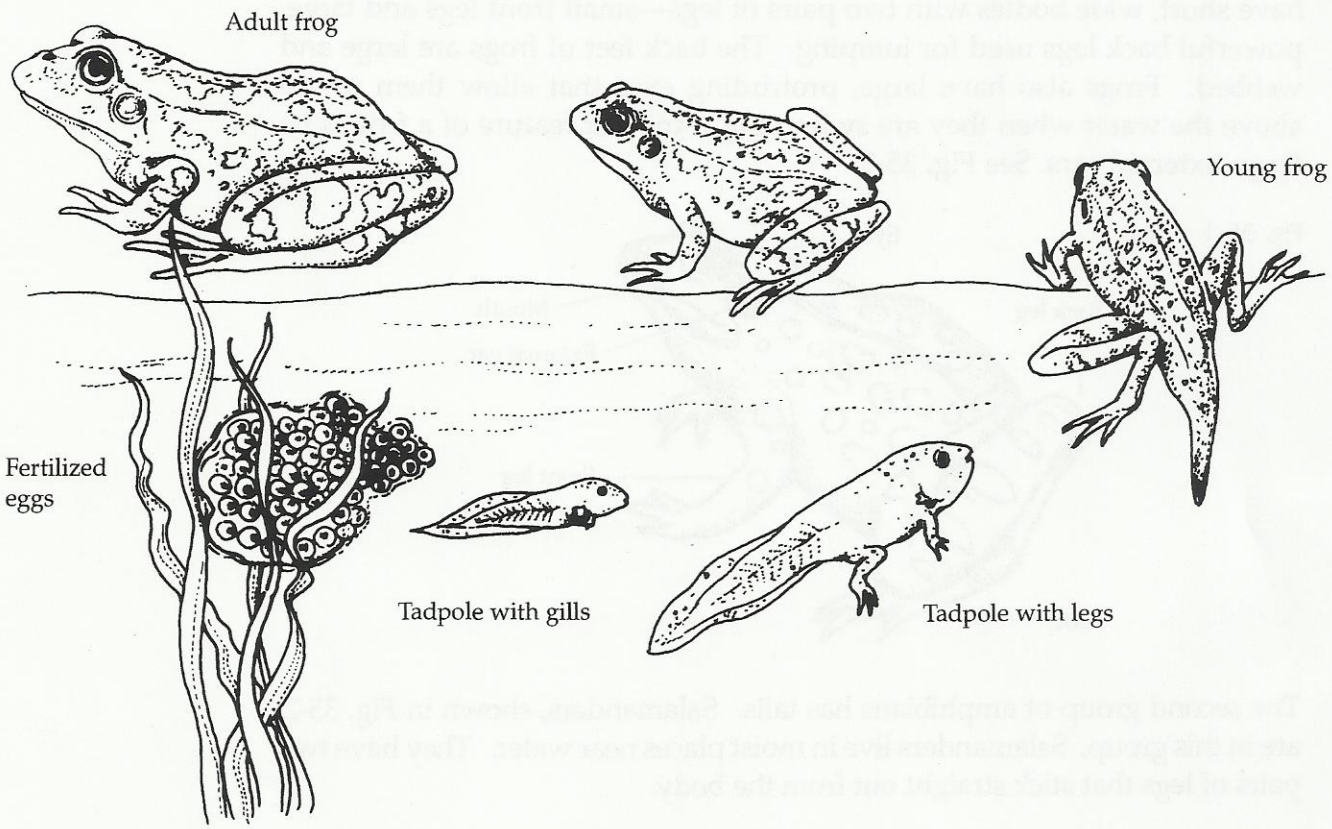
Fig. 35-2 Salamander



Reproduction in Frogs. There are both male and female adult frogs. During reproduction, the female frog lays eggs in water. The male frog then releases sperm cells and spreads them over the eggs. Recall that reproduction in which sperm fertilizes the eggs outside the body is called external fertilization. The fertilized eggs then grow and develop. They eventually hatch into tadpoles.

Life Cycle of Frogs. A **tadpole** (TAD-pohl) is the immature stage of a frog. The tadpole lives in water and goes through a series of changes as it develops. Fig. 35-3 shows the series of changes in the frog life cycle. The young tadpole has a tail, breathes through gills, and eats plants. The tadpole gradually grows legs, and the tail disappears. Gills are replaced by lungs. The young frog can now survive on land. Unlike tadpoles, adult frogs eat other animals, mostly insects.

Fig. 35-3



TAKE ANOTHER LOOK

Fig. 35-4 summarizes the differences between fishes and amphibians.

Fig. 35-4

Characteristics	Amphibians	Fishes
Habitat	On land or in water	Only in water
Fertilization	External	External
Skin protection	Mucus	Scales and mucus
Breathing structure	Gills when young, internal lungs as adult	Internal gills
Body temperature	Ectothermic	Ectothermic
Limbs	Two pairs of legs	Fins
Heart	Three chambers	Two chambers

Check Your Understanding

Write a sentence explaining the connection between each pair of words.

2. amphibian, lungs _____

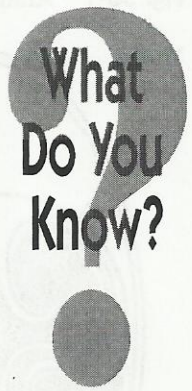
_____

3. tadpole, frog _____

_____

Fill in the blanks to complete the following paragraph.

Amphibians are **(4)**_____ that usually live part of their life on **(5)**_____ and part of their life in the **(6)**_____. Mature frogs have internal **(7)**_____ rather than external **(8)**_____. To keep their skin from drying out, amphibians have **(9)**_____. Frogs reproduce by **(10)**_____ fertilization. Immature frogs are called **(11)**_____.



12. What are the two main kinds of amphibians? _____

_____

13. What are three adaptations amphibians have for life on land?

_____

_____

14. How are amphibians different from fishes? _____

_____

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15. How are tadpoles different from adult frogs? _____

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