



Double Life!

RESEARCHER: Dr. Beryl Bwong

TOPIC: Double Life

THEME: Amphibians

DEPARTMENT: Herpetology



Frog eggs
Source: NMK - Herpetology

Lesson Objectives

1. The participants shall be able to define herpetology and amphibians.
2. The participants shall appreciate the importance of amphibians to the ecosystem.
3. The participants shall explore adaptation of amphibians to different habitats.
4. The participants shall appreciate the importance of conservation of amphibians.

Learning resources

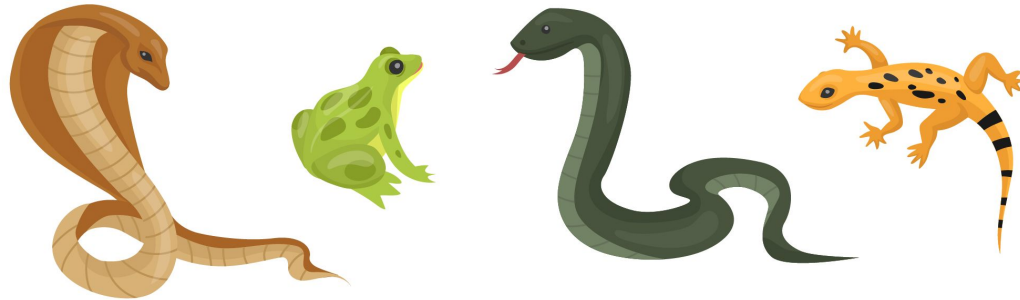
1. Text
2. Video
3. Photo

What is Herpetology?

Herpetology is the field of zoology that deals with the study of amphibians and reptiles including snakes, lizards, frogs, toads and salamanders. It comes from the Greek word '*Herpeton*' meaning organisms which creep and crawl on their bellies.

Amphibians are different from reptiles. They do not have scales and their skin is usually moist with mucus, which keeps them from drying up.

A person who studies and researches on reptiles and amphibians is called a herpetologist.



Amphibians and reptiles
Source: iStock

What are amphibians?

Amphibians refer to any organism that is able to live both on land and in water. The word '*amphibia*' means double life or two-phase life cycle. Examples of amphibians are: frogs, toads, newts and salamanders.

Characteristics of amphibians:

1. They have thin and smooth skin, with glands that make it moist.
2. They lay eggs without shells in or near water.
3. Their body temperature depends on the temperature of the surroundings.
4. Some have feet, others have no legs while others have webbed feet.
5. Some amphibians can breathe through their skin as well as their lungs.
6. They are vertebrates.

Major Groups of Amphibians

Amphibians are divided into three major groups or orders:

Caecilians

These are worm-like legless amphibians that live in soil, leaf litter or in water.



Newts and salamanders

These are amphibians with two pairs of limbs and a tail.



Frogs and toads

These are amphibians with two pairs of limbs with no tail.



Habitat and Adaptation

Amphibians live in all types of habitats such as forests, dry-lands, deserts, and wetlands. They do not live in extremely cold areas such as the North and South Pole.

They live in a variety of ways; on land as burrowing animals (terrestrial), in water (aquatic), and on trees (arboreal). Many diverse species are found in areas of moderate temperatures and moderate to high rainfall.

How are amphibians adapted to their habitats?

Aquatic: Those that live in water have heavily webbed feet and a streamlined body.

Terrestrial: Those that live on land blend with the surroundings to disguise their appearance. This is known as cryptic colouration.

Burrowing: Those that burrow have a hard pointed snout for digging through the soil, powerful hind limbs and reduced eyes.

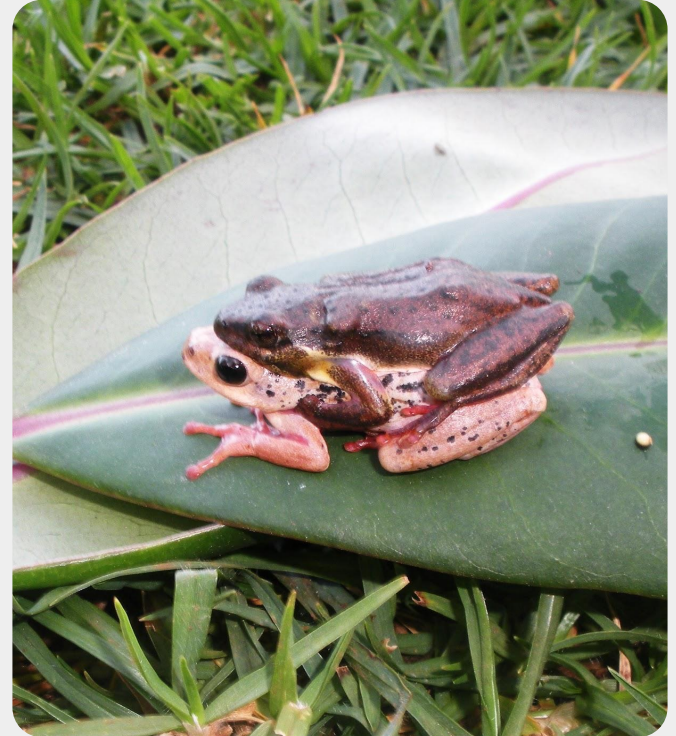
Arboreal: Those that live on trees have toes expanded into sticky pads with some having opposable (flexible) fingers.

Amphibian Reproduction

Amphibians have different reproduction patterns. Their life cycle consists of three main stages: egg, aquatic tadpole or larva and adult. The process by which the tadpoles lose their tails and change into adult frogs is called **metamorphosis**.

Not all amphibians undergo this cycle. Some amphibians like frogs, salamanders and caecilians skip the tadpole stage and instead the eggs are laid in leaf litter and hatch into small frog-lets. Some frogs lay eggs in moist surfaces on land for example, in holes, on tree trunks or in rock crevices (cracks).

Most amphibians do not take care of their eggs but some are known to carry eggs on their backs (*Pipa*) and or stomachs until they hatch into tadpoles. In some species, the males swallow late-stage eggs into their vocal sac until they hatch. Such species are not found in Kenya.



Frogs breeding
Source: NMK - Herpetology

Amphibians Diet

1. Amphibians eat different types of food, swallowing their prey whole. They 'swallow anything that moves and is smaller than the hunter'. Adult amphibians are predators mainly hunting and feeding on live invertebrates such as insects, cockroaches, grasshoppers, crickets, ants and earthworms. Some amphibians feed on other frogs, their eggs or tadpoles.
2. Juveniles (young ones) are mostly vegetarians, they feed by filtering out small algae in the water and chewing stems or leaves of water plants. The juveniles are occasionally carnivorous, feeding on other tadpoles.



Tadpoles
Source: NMK - Herpetology

Importance of amphibians

Amphibians are beneficial to the ecosystem in different ways:

- Small frogs and tadpoles feed on mosquito larvae to control diseases, for example malaria.
- Amphibians eat pests, for example insect pests which is beneficial to agriculture.
- Amphibians contribute to balance in nature. They eat other organisms as well as being an important source of food for a variety of organisms.
- Some unique and beautiful amphibians can be kept as pets, such as the colourful reed frogs.
- Their moist, permeable skin makes amphibians vulnerable to drought and toxic substances such as pesticides, so they are exceptional indicators of a healthy ecosystem.
- Amphibians are a tourist attraction in farms and parks.

Threats

Amphibians are facing many threats to their survival. Such threats include:

- Habitat loss due to human activities such as clearing of land for infrastructure and agriculture.
- Use of agro-chemicals in farming.
- Illegal collection of amphibians for trade.
- Persecution, meaning deliberate harming and killing of amphibians.
- Diseases such as the Chytrid fungus.
- Periodic climate variability (change).



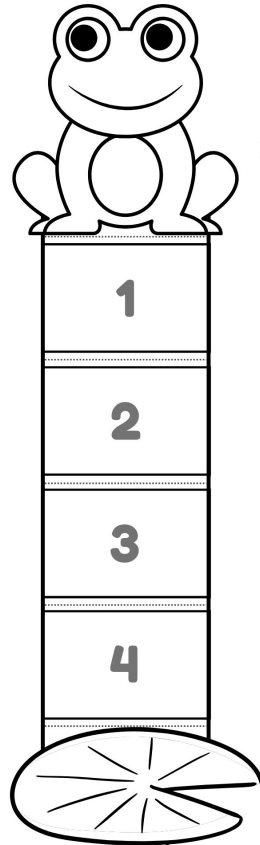
Habitat Destruction
Source: NMK - Herpetology

Conservation

The public can help in the conservation of amphibians by:

1. Conserving the habitats where amphibians breed.
2. Avoiding the draining and polluting of wetlands.
3. Stopping deforestation.
4. Reporting any illegal collection of amphibians to authorities.
5. Reporting any mass deformities and or deaths of amphibians if observed.

Exercise



Life Cycle of a FROG

Instructions:

1. Color the frog and the stages of its life cycle.
2. Cut and paste the pictures in order on the boxes.
3. Cut around the frog template and fold the dotted horizontal lines into pleats.

