

OL PEJETA CONSERVANCY

TOPIC 2: HOW ANIMALS FUNCTION



PART 2: REPTILES, AMPHIBIANS, AND INSECTS

TOPIC 2: HOW ANIMALS FUNCTION

TOPIC OUTLINE

We have now established that, as humans, we share the planet with many other living things. There are many different types of species and all of them are in some way connected to each other in the greater web of life.

Hence all living things, each with different requirements for survival, need to live together and share resources. For us to be able to coexist with other living things in the environment, it is important that we understand how they function and why they do the things they do.

In this topic, learners will understand how animals are: grouped for classification purposes; adapt to their environment; compete for survival; feed; and interact with each other.



SUB-TOPICS:

Reptiles and amphibians

- Learners will be able to identify and name a few reptiles and amphibians seen both on Ol Pejeta during their visit and in their own environment.
- Learners will develop an understanding of:
 - the difference between amphibians and reptiles;
 - the difference between warm blooded and cold blooded;
 - what **metamorphosis** is;
 - the **adaptations** of amphibians and reptiles.

Insects

- Learners will discover:
 - more about insects and how they function;
 - how various **adaptations** in species of insects help them cope with their environment.

Please note: the activities below act as guidelines. You may wish to adapt them to suit the needs of your class (e.g. different age groups, abilities, grades, materials and time available).

ACTIVITY SHEETS: REPTILES AND AMPHIBIANS



BACKGROUND INFORMATION

Unlike mammals and birds, reptiles and amphibians are cold blooded; they cannot make or maintain their own heat (as warm blooded creatures do by regulating their bodily processes) so their body temperature changes based on the temperature of their environment.

The majority of amphibians and reptiles start life from eggs. Amphibians lay their eggs in water without a hard shell, whereas most reptiles bury their eggs (with a hard shell) underground. Reptile eggs hatch as small versions of adults, whereas amphibian eggs hatch in water

and have to grow up there before moving to land. Amphibians have a complex life cycle where changing or **metamorphosing** into different body shapes/structures enables them to adapt to two different habitats (one in water and one on land).

ACTIVITY 1

REPTILIAN-AMPHIBIAN

10+ YRS

OPC

Objective:

- To learn about and be able to identify a selection of reptiles and amphibians found on Ol Pejeta and at home; to discuss and explore a range of questions covering the behaviour of reptiles and amphibians.

Age group:

- 10+ years

Materials needed:

- Notebooks/paper
- Pencil or pen
- Binoculars, if possible

Procedure:

1. Encourage the learners to look out for and identify various amphibians and/or reptiles as they go on their game drive and also to the Chimpanzee Sanctuary forest walk, Hippo Hide, and Morani Information Centre.
2. Ask the learners to make a list of some reptiles and amphibians they have seen – whether at Ol Pejeta or at home. As the facilitator, you can help add to the list any that the learners did not think of.
3. Have the learners draw pictures of amphibians and reptiles in their notebooks and label various characteristics (such as colour, size, etc.).
4. As a whole group, make a list of the common characteristics of reptiles and amphibians. Draw attention to and add any more that the learners have not thought of.
5. In pairs, discuss the general differences between reptiles and amphibians. Discuss answers as a whole class.

**Discussion points**

In pairs, small groups, as a whole class, or as an individual research task/writing piece, the facilitator can help the learners discuss the following topics:

- How do reptiles and amphibians communicate?
 - Learners should give examples of specific animals, such as chameleons changing colour in response to their emotions or to attract mates; the hissing of snakes; or the croaking of frogs. Can we understand the meaning of their behaviour?
- What can we observe in the colouration and patterns in frogs, toads, snakes, and lizards with regards to **camouflage**?
- What do reptiles and amphibians eat, and how do they eat it?
 - For example, lizards and frogs eat insects while most snakes eat birds, their eggs, small rodents, or other snakes.
- What happens during the life cycle of a frog/toad?

ACTIVITY 2

TORTOISE PUPPET

8- YRS**OPC/HOME****Objective:**

- To use crafts and performance to engage younger learners in the life cycle of reptiles.

Age group:

- 8 and under

Materials needed:

- Paper plates (two per learner)
- Stapler
- Old socks – preferably green – with ‘googly’ eyes glued on (pre-prepared if possible; one per child)

Procedure:

1. Give each of the learners two paper plates. Explain to them that they should colour one to resemble the top shell of a tortoise, and one to resemble the bottom shell. Show them a picture if necessary.
2. Staple the plates together on the sides only (so that each child can still put their hand through).
3. Give each learner one of the pre-prepared socks and show them that they should put their hand inside.



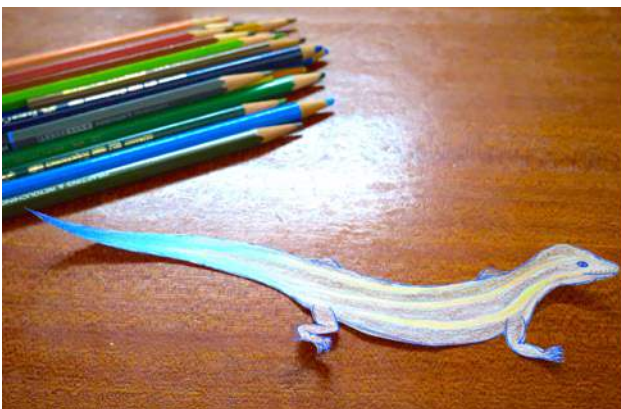
4. Have each learner copy you as you use the tortoise puppet to tell the story of the life of a tortoise! (eggs - hatchling - juvenile - adult)

5. If you have extra time or you have a more advanced/older group, you might now ask them to repeat the 'story' back to you.

FACT BOX**TORTOISE REPRODUCTION**

After tortoise eggs are laid, the female covers them with sand, soil, or other organic material. The eggs are incubated for 100-160 days, after which the hatchlings break out of their shells.

Tortoises generally have one of the longest life spans of any animal, with some recorded to have lived more than 150 years.

8- YRS**OPC/HOME****ACTIVITY 3****LIZARD BRACELET****Objective:**

- To use arts and crafts as a warm up/cool down activity when learning about reptiles to engage younger learners in the topic.

Age group:

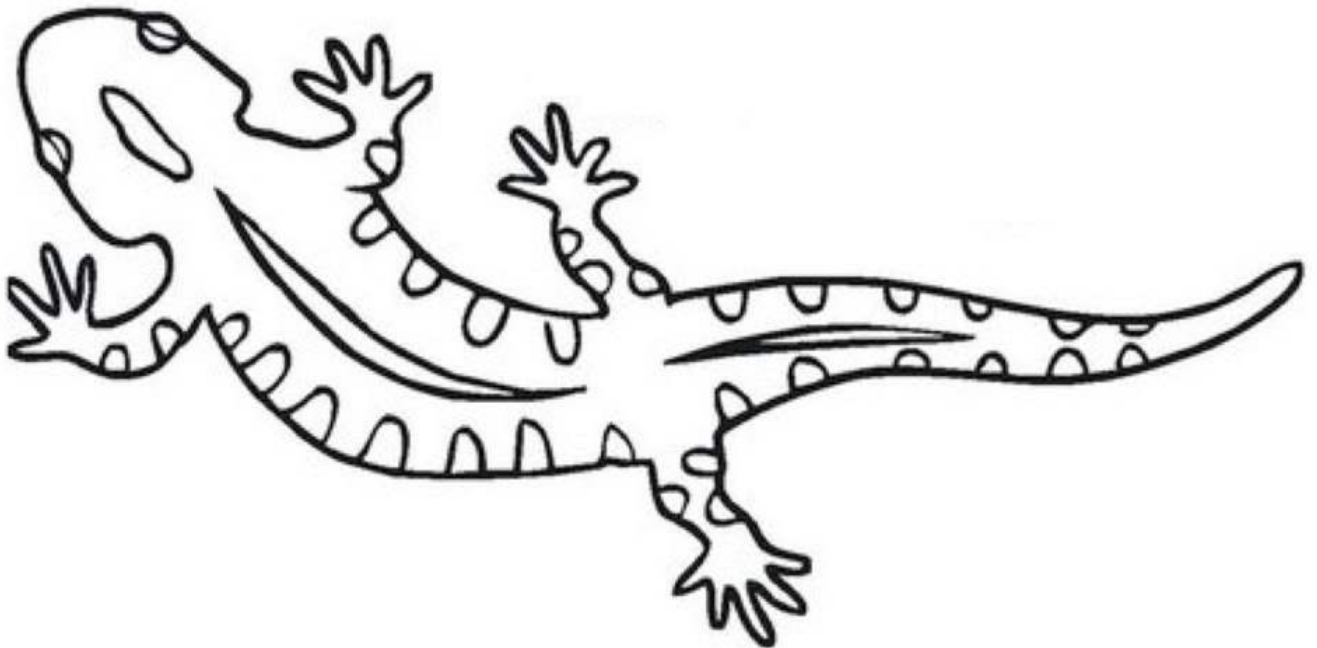
- 8 and under

Materials needed:

- Lizard template (below) – one per child
- Scissors
- Colour pencils or paint
- Stapler

Procedure:

1. Print out the lizard templates and cut out one per child. Alternatively, you can get the children to cut their own, or, if you do not have a printer, the children can draw or trace their own and cut them out.
2. The children should use colours or paints to decorate it.
3. Help each student wrap their lizard around their wrist and stable the tail to the head.
4. If you want to stretch your students' abilities, you could print out a larger version of the lizard, label some facts onto it, and write on the different body parts. Decorate it as a class and stick it up on your classroom wall as both a nice decoration and a way of learning and memorising the information.



ACTIVITY SHEETS: INSECTS

BACKGROUND INFORMATION

Insects are the largest group in the animal kingdom. They have hundreds of different adaptations and characteristics: some can fly while others crawl; some have many legs and some have few; some are poisonous while others are completely harmless.

Insects help us by:

1. **Pollinating** our food crops.
2. **Decomposing** organic matter.
3. **Controlling pests:** insects like ladybirds and beetles feed on aphids that destroy flowers and crops.
4. **Providing us with products** like silk, honey, beeswax.

Sometimes insects can also harm us – they can spread disease and damage plants and infrastructure.

Insects have complex life cycles. To grow into an adult, they go through 4 stages: egg, larva, pupa (chrysalis) and adult. This is called **metamorphosis**. At each stage, the organism has a different goal - for instance, caterpillars need to eat a lot, whereas adults (in the form of butterflies) need to reproduce.



ACTIVITY 1

INSECT INSPECT

ANY AGE**OPC****Objective:**

- To start thinking about the different types of insects found in the Ol Pejeta and home environments of the learners and facilitate discussion about common characteristics of insects.

Age group:

- Any age

Materials needed:

- Notebooks
- Pens/pencils
- Binoculars, if possible
- Magnifying glass

Procedure:

1. Encourage the learners to look out for and identify any insects that they see on their field trip to Ol Pejeta. They should write these down in their notebooks along with any others they can think of from their school or home environment.
2. Feedback as a whole group: get each learner to name at least one insect so that you have a communal class list, and help to add any that they did not think of.
3. At Ol Pejeta the learners can carry magnifying glasses to look closely at the different insects they observe while at the various stop points. They should record what they see.

Discussion point

In pairs, small groups, as a whole class, or as an individual research task/writing piece, the facilitator can help the learners discuss the following topic:

- What do you know about insects? What characteristics do insects share?

9+ YRS**HOME****ACTIVITY 2****MAKE YOUR OWN SWEEP NET****Objective:**

- To use home-made sweep nets for learners to independently study and improve understanding of insect anatomy.

Age group:

- 9+ years

Materials needed:

- Per pair or small group:
 - One wire hanger
 - An old, light-coloured pillowcase
 - Scissors
 - Long wooden stick
 - Duct tape/cello tape
 - Clear glass jar with loose lids/mesh/paper with holes in to cover the top (you may also need an elastic band)
- Magnifying glass

**Procedure:**

1. This activity may be divided into several parts. The first part involves showing the learners how to make the sweep nets (which they should do in pairs or small groups). You may want to make one in advance so you can show students what it should look like, looking at the picture for reference:
 - a. Pull the triangular part of the wire hanger out to form a circle, straightening the hook part of the hanger so it can be attached to the stick.
 - b. Cut about one third off the open end of a pillow case and pull the mouth of the pillowcase over the wire loop.
 - c. Tape it securely around the perimeter.
 - d. Attach the straight part of the wire to the long stick and secure with duct tape.

2. The second part involves explaining to the students that they are to use the sweep nets in any long grass – whether in their school compound or at home – to look for and collect insects. They should put the insects in the clear jars with loose lids, mesh, or paper with holes in so the insects can breathe.
3. Learners should then observe their insect(s) and record the following information:
 - a. number of legs;
 - b. number of body segments;
 - c. whether it has antennae or wings;
 - d. what colour the insect is.
4. Each pair or group should present their findings to the class.
5. Make sure you set your insects free when you have finished!

Discussion point

In pairs, small groups, as a whole class, or as an individual research task/writing piece, the facilitator can help the learners discuss the following topics:

- What do you know about the life cycles of different insects (e.g. butterflies)?
- How do different insects move?
- How can we explain the different colouration of various insects?
- How do different insects communicate?
- What is the social structure of different insect species?
 - You may wish to use this opportunity to teach your students the case study below.

FACT BOX

ULTRASONIC BATS

Some insects use their colour to defend themselves against predators by warning or confusing them. Others may use colour as **camouflage**, such as the stick insect.

INSECT COMMUNICATION

Some insects use sound (like crickets), some use light (such as fireflies), some use odour (such as moths), and some insects, like honeybees who dance to communicate the location of food to other bees, communicate physically.

CASE STUDY: TERMITE COLONIES

Some insects like termites live in colonies where the social structure is organised into a caste system based on individuals' different roles:

THE REPRODUCTIVES

The reproductive class includes primary reproductives (the king, queen and swarmer termites) and secondary reproductives (the main source of egg production to support the queen, once the colony is established). The king and queen are the colony's founders and are responsible for increasing the colony's population. When weather conditions are optimal, the queen produces many primary reproductives (called swarmers) that fly out of the colony to start new colonies.

THE SOLDIERS

Soldier termites are responsible for defending the colony from invaders, such as ants.

THE WORKERS

Worker termites are responsible for building and repairing mud tubes and tunnel walls, feeding other termites in the colony, caring for eggs, removing mould and mildew from tunnel walls, and removing dead termites from the colony.

ADDITIONAL ACTIVITY

9+ YRS

HOME

Materials needed:

- Sweep nets (see above activity for how to make these if otherwise unavailable)
- Tape measure
- Clear glass jars

Procedure:

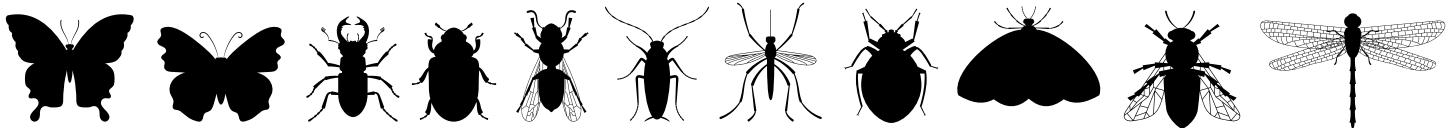
1. Have learners look for and collect grasshoppers with the sweep nets, putting the grasshoppers in the clear jars with loose lids, mesh, or paper with holes (secure with an elastic band) so that the insects can breathe.
2. In pairs or small groups, observe and describe the characteristics of the grasshoppers. Re-join as a whole class to hear feedback from each group.
3. Explain that grasshoppers can move 20 times the distance of their height with a single jump.
4. Ask for a volunteer and measure his/her height. Get the class to calculate how far the student must jump (20 x their height).
5. Set the starting line and end line (using the tape measure), and see how many jumps it takes the student to reach their target distance.
6. Explain to the students that this shows just how impressive the grasshopper's abilities are.
7. Make sure you set your grasshoppers free!

5-8 YRS

OPC/HOME

ACTIVITY 3

COLOUR THE INSECT CYCLES



Objective:

- For younger learners to develop their creativity while learning about the life cycles of different insects.

Age group:

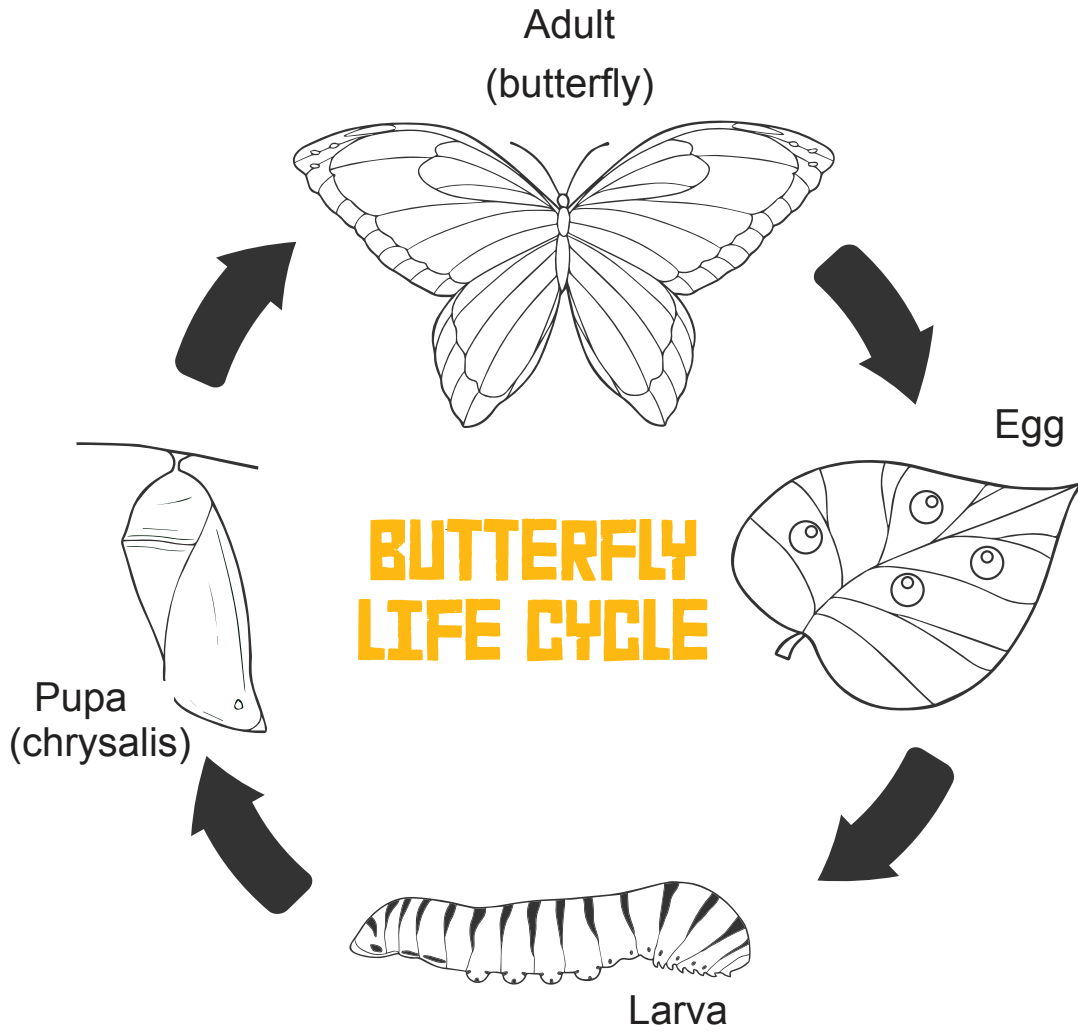
- 5-8 years

Materials needed:

- Insect life cycle colouring sheets (next page)
- Colouring pencils or paint

Procedure:

1. Explain the different life cycles, including the transformation taking place at each step, to the class (perhaps using a blackboard/whiteboard) using the diagrams below.
2. Give each student an insect cycle of choice and allow them to colour it in.



LADYBIRD LIFE CYCLE

