



The role of the environment in the breeding success of Southern Ground-Hornbills.

Aim: *To understand that there are different biomes worldwide, and how these environments relate to Southern Ground-Hornbills, their survival, breeding success and conservation.*

Objectives

Students will be able to:

1. Know the main biomes Southern Ground-hornbills can be found in.
2. Understand how these biomes are important to the species.
3. Learn about Southern Ground-Hornbill breeding and lifecycles.

Materials Needed:

Fact sheets 3 and 4 (1 set per pair of students)

Colouring-in sheet 2 (as an extra activity as needed)

Computer/project/printer to show images.

Image 1, 2 and 3 (links and images provided at the end of this document)

Question Sheet 2 (1 per student) (Appendix A in this lesson plan)

Answer Sheet 2 (1 per teacher) (Appendix B in this lesson plan)

Bingo Sheet (1 per pair of students) (Appendix C in this lesson plan)

Bingo Reward (of your choice, suggested treat or sticker)

Keywords:

Altitude

Height above sea level.

Alpha breeding pair

The highest-ranking and only breeding male and female birds within a group of Southern Ground-Hornbills.

Biome

An area that can be classified according to its geology, soils and the the plants and animals that live in it.

Canopy

The upper layer/ branches of mature trees.

Co-operative breeding

Offspring receive care not only from their parents, but also from additional group members (also known as alloparental care).

Endemic

Only found in a specific place.

Fledging

When a chick leaves the nest.

Vegetation

The collection of plants found in a specific area or habitat.

Topography

The surface features of land, e.g. flat plains, hills, valleys or mountains.

Activities: (Approx. 60-minute lesson)



Activity	Description	Estimated Time (minutes)
1. Lesson Introduction	Introduce the Southern Ground-Hornbill (SGH) as the Bird of the Year.	5
1.1	Make known their conservation status (Endangered) in South Africa.	
1.2	Explain that they are found in three main environments (biomes) in Africa in which they live and breed.	
1.3	Explain lesson aims and objectives.	
2. SGH Environments	Describe the environment and point out key features using the images:	10
2.1	Show image 1 of a savanna. <ul style="list-style-type: none"> - Largest biome in Africa. - Supports a high diversity of life. - Composed of a grassy and woody layer. - Warm and relatively dry environment. - Summer rainfall with intermittent droughts. 	
2.2	Show image 2 of grasslands.	
	<ul style="list-style-type: none"> - Occupies SGH range. - They make up around 28% of the land surface area of South Africa. - Characterised by a single vegetation layer of different grass species. - Has ranging topography and altitude. 	
2.3	Show image 3 of open woodlands.	
2.4	<ul style="list-style-type: none"> - Composed of woody vegetation (trees and shrubs). - Openly spaced canopies. - Trees provide one of the critical nesting areas for Southern Ground-Hornbills 	
3. Worksheets	Hand out fact files 3 and 4 and the question sheets.	25
3.1	Ask students to read through the fact sheets and then fill out the question sheets using these resources.	
	If some students finish quicker than others, give them colouring- in sheet 2.	
4. Evaluation	Ask students to swap question sheets with the pupil next to them.	10
4.1	Read the answer sheet out loud and get them to peer mark each other- writing correct answers where necessary.	
4.2	Return answer sheets.	
5. Bingo Game	Hand out bingo sheets and explain the game rules. Play as many rounds as time allows.	10

Southern Ground-Hornbill- Breeding and Environments

1. Name the three main biomes Southern Ground-Hornbills can be found in. (3 points)

2. Describe the vegetation layers found in each of the three biomes. (3 points)

3. Which is the largest biome in Africa? (1 points)

4. Why are open woodlands important for Southern Ground-Hornbills to breed? (1 point)

5. Southern Ground-hornbills are known as co-operative breeders. What does this mean? (1 point)

6. How do the helper birds assist the breeding female? (2 points)

7. Southern Ground-Hornbills breed in summer. What is a summer characteristic of their environments that coincides with this? (1 point)

8. Why does the female lay 1-3 eggs but rarely raises more than one chick? (2 points)

9. How might a low breeding and fledging rate effect the species' population? (2 points)

10. Name one reason why it is important to protect the environments Southern Ground-Hornbills are found in? (1 point)

1. Name the three main biomes Southern Ground-Hornbills can be found in. (3 points)
 - *Savanna*
 - *Open woodland*
 - *Grassland*

2. Describe the vegetation layers found in each of the three biomes. (3 points)
 - *Savanna has both a grassy and woody vegetation layer.*
 - *Grasslands have a grassy vegetation layer.*
 - *Woodlands have a woody vegetation layer (trees and shrubs)*

3. Which is the largest biome in Africa? (1 points)
 - *Savanna*

4. Why are open woodlands important for Southern Ground-Hornbills to breed? (1 point)
 - *Southern Ground-Hornbills can use the cavities of the trees found in this environment to nest in.*

5. Southern Ground-hornbills are known as co-operative breeders. What does this mean? (1 point)
 - *There is only one alpha breeding pair and the other birds in the group act as helpers to provide for the female and chick.*

6. How do the helper birds assist the breeding female? (2 points)
 - *They provide the female with food.*
 - *They also provide the female with soft dry leaves they collect as nesting material.*

7. Southern Ground-Hornbills breed in summer. What is a summer characteristic of their environments that coincides with this? (1 point)
 - *Rainfall.*

8. Why does the female lay 1-3 eggs but rarely raises more than one chick? (2 points)
 - *The first chick to hatch is usually the only one to survive as it is fed more by the female. Therefore, the other chicks will eventually starve.*
 - *The younger chick/chicks are an insurance policy in case the first chick does not survive.*

9. How might a low breeding and fledging rate effect the species' population? (2 points)
 - *The population may have low numbers as deaths may exceed the number of chicks born that reach breeding age.*

10. Name one reason why it is important to protect the environments Southern Ground-Hornbills are found in? (1 point)
 - *They rely on their habitats to survive.*
 - *They rely on their habitats for their food sources.*
 - *They rely on their habitats to breed and nest.*
 - *They are an Endangered species with low population numbers.*

BINGO

Choose from the words below and write one (in pencil) in each box randomly.

Savanna

Canopy

Alpha breeding pair

Tree cavity

Fledging

Breeding

Chick

Grassland

Open Woodland

Biome

Thunder

Altitude

Waterhole

Nest lining

Southern Ground-Hornbill Breeding and Environments

Teacher Instructions- BINGO

Read randomly the ***description/clue*** of one of the words in the list below. Allow students a minute to discuss in their team (suggested pairs) which word you are referring to and tick it off their bingo sheet if applicable.

Once a team has a straight line of words crossed off (down or across) they must shout bingo. The first to do so is the winner of the round. Check you have said the words in their winning row and end the round if they were correct.

Distribute a suitable prize such as a treat or sticker.

Answer List:

Word	Description/Clue
Savanna	The largest biome in south Africa made up of both grassy and woody vegetation layers.
Canopy	The upper layer of mature trees.
Alpha breeding pair	The birds which re-produce in a group of Southern Ground-Hornbills.
Tree cavity	A nesting area for Southern Ground-Hornbills.
Fledging	When a chick leaves the nest.
Breeding	In Southern Ground-Hornbills this occurs in Summer from September to December.
Chick	A newly hatched bird is referred to as this.
Grassland	Characterised by a single vegetation layer of grass species.
Open Woodland	An area composed of scattered trees.
Biome	A distinct area defined by its characteristics and the plants and animals that can be found there. Savanna, grasslands and woodlands are three examples of this.
Thunder	Southern Ground-Hornbills can often be associated with this weather.
Altitude	Southern Ground-Hornbills can be found as high as 3000m.
Waterhole	An area common to find Southern Ground-Hornbills.
Nest lining	Soft dry leaves provided by adult males to the female bird.

Image 1- Savanna



Located at:

<https://commons.wikimedia.org/wiki/File:Tarangire-Natpark800600.jpg#/media/File:Tarangire-Natpark800600.jpg>

Image 2- Grassland



Located at:

https://commons.wikimedia.org/wiki/File:Grassland_on_Imba_Abba_Salama.jpg#/media/File:Grassland_on_Imba_Abba_Salama.jpg

Image 3- Open Woodland



Located at:

<http://vecea.vegetationmap4africa.org/docs/Wm.html>