2018 Revised Edition

The Rhino CARDS

teachers pages

The Rhino CARDS

teachers pages

This set of teaching materials has been developed to support teachers in the rural areas as most schools in these areas are often seriously short of resources. Many lack even basic text books. It can be extremely difficult to teach under such conditions especially when no reference materials are available. It is hoped that the materials provided in this package will help by offering the necessary information and ideas.

This guidebook has been written to give teachers and students the opportunity to discover the rhinoceros which is a very rare and special animal. We the people of Africa, and especially our children, play a vital role in protecting this unique animal from being destroyed forever. Here you can find information about where and how rhinoceroses live, why they are under threat of extinction, what is being done to save them and the important roles we all can play in protecting the African rhinoceroses from extinction.

This guidebook is part of a SCHOOL SET of teaching materials for rural schools that has been developed to promote awareness of the rhinoceros. This set was first published in 2006 and updated this year This update has been made to ensure integration with the updated national syllabus, introduced in 2017.

Part one of the guidebook contains information about the rhinoceros. It is designed to be an easy reference material for teachers to provide them with a better understanding of the rhinoceros and helping them to find answers to students' questions.

Part two of the guidebook is designed to support teachers in the use of the RHINO CARDS which have been developed for use within the updated Zimbabwean primary school syllabus introduced in 2017. There are eight sets of eight cards each that can be used to teach Environmental Science, Mathematics and English. Each card is designed in such a way that it can be given to the students as a learning aid. This section explains how the cards are to be used. The section also provides ideas on how to expand the use of the cards, games to play and the suggested activities.

While the material was originally developed under the SADC Regional Programme for Rhino Conservation, this revision and reprinting was made possible with funding from the United States Fish and Wildlife Services (USFWS).

Credit and thanks must be given to the various people and organizations that so generously shared their time, ideas and advice to help in the development of this material. The list includes: The Lowveld Rhino Trust; Action Institute for Environmental Health and Development Communication;the primary school teachers and students from rural communities adjacent to Save and Bubye Valley Conservancies in Beitbridge, Bikita, Buhera, Chiredzi, Chipinge, Mwenezi and Zaka Districts.

LOWVELD RHINO TRUST

The Rhino Card Team 2018

contents

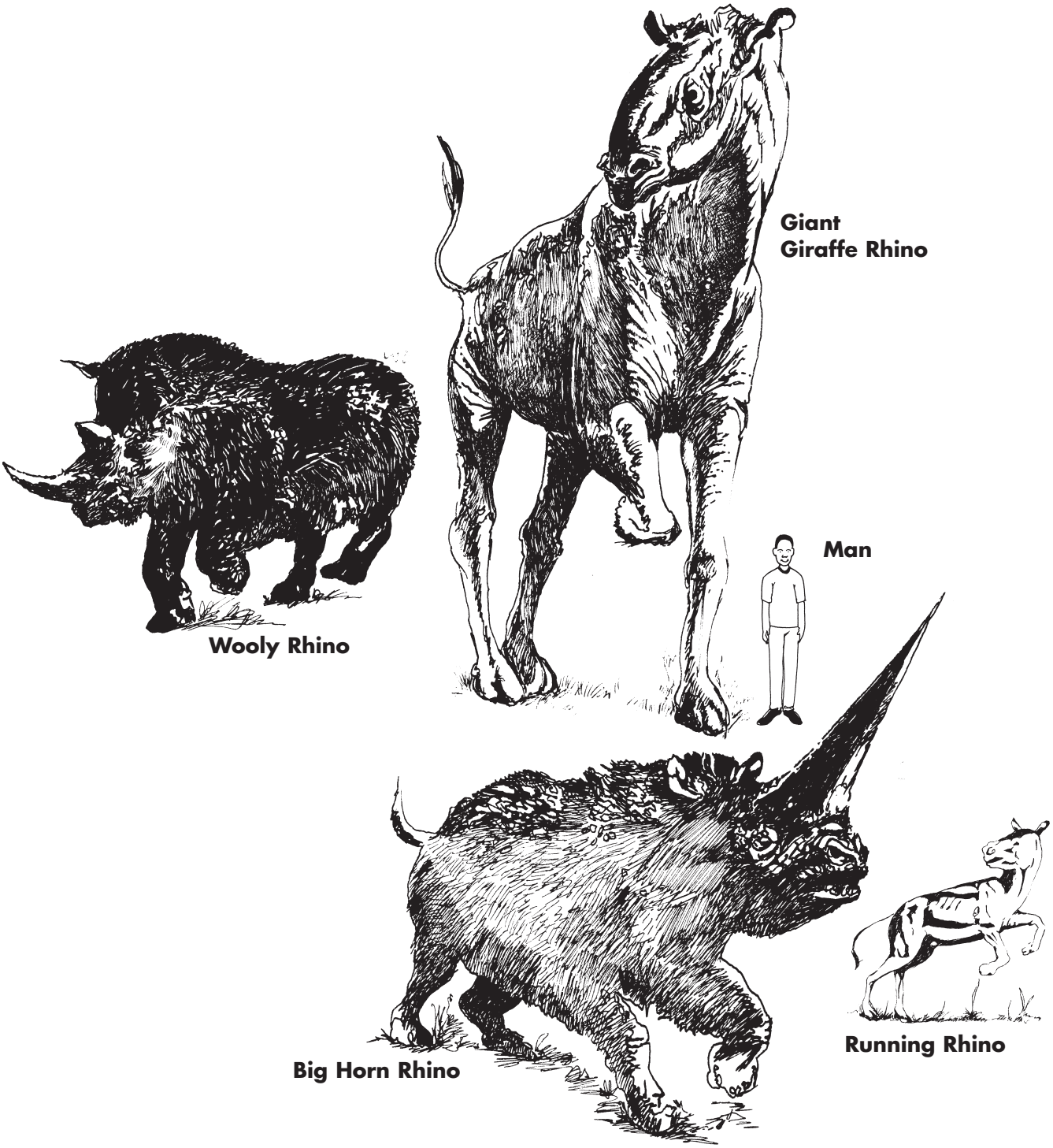
Part One

Part Two

general Rhinoceros History

Part 1

The Rhinocerotoids (ancestors of the modern rhinoceros) first appeared on earth 50 million years ago. They have been the most diverse and successful large herbivores the world has ever seen. Hundreds of different species of rhinoceroses have come and gone from this planet. The largest land mammal that ever lived was a rhinoceros. It stood up to six metres tall at the shoulder, may have weighed 20,000kg (about the same as four big elephants) and its skull was over two metres long. Its large size and long neck indicate that it was a sort of rhino-giraffe, eating from the tops of trees. There were also small, hornless, long legged running types of rhinos. Others were water living grazers much like the hippo.



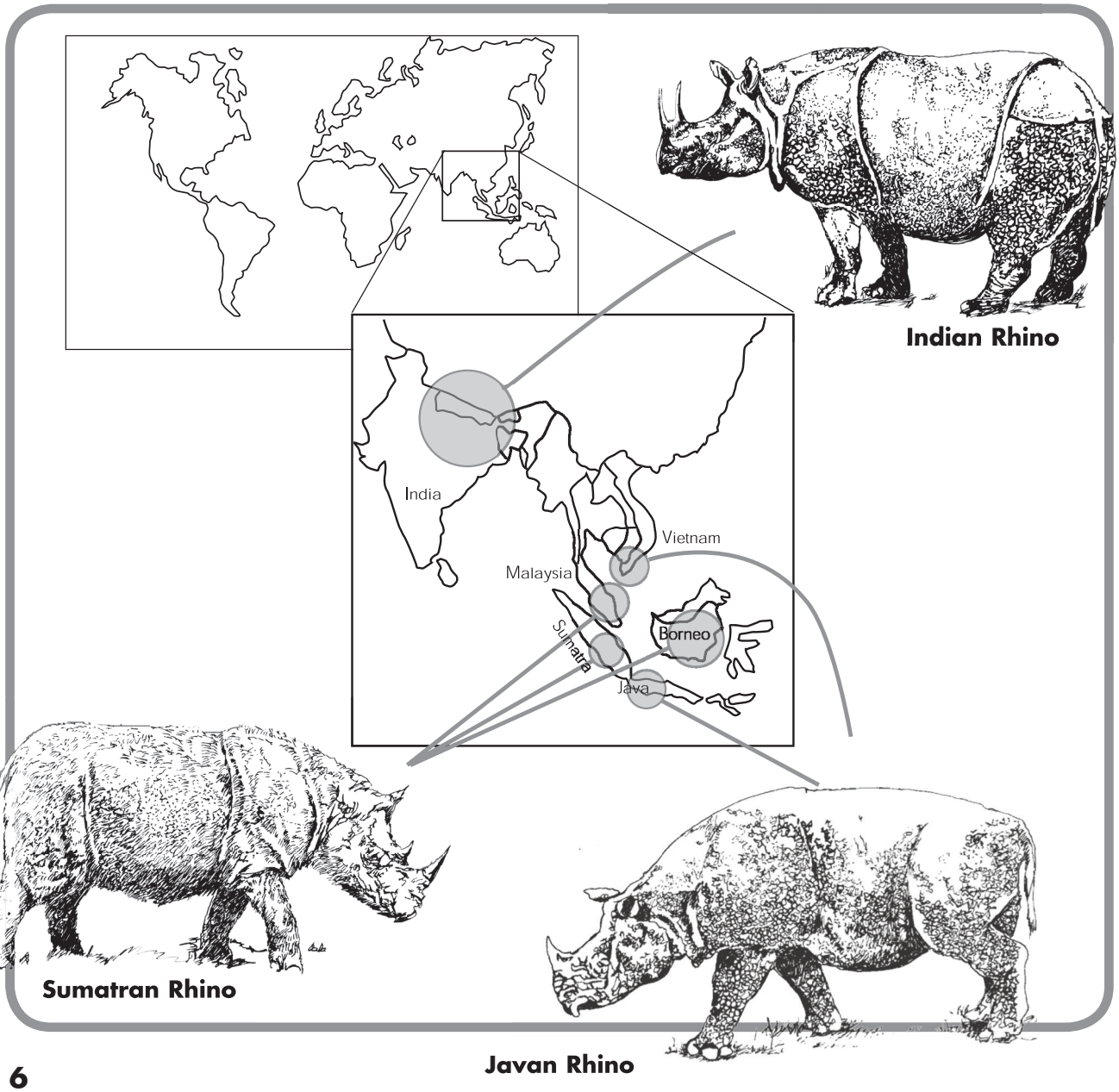
The modern rhino that we see today evolved between seven and ten million years ago. Modern man has only been here for less than half of that time. The rhinoceros is actually one of the oldest living species.

Today the world has only five different types of rhinoceros. Asia is home to the Indian (Greater one horned), Javan and Sumatran rhinoceroses. The black and the white rhinoceroses live in Africa.

Indian or the Greater one horned rhinoceros is the largest of all the rhinos. It may be as tall as two metres at the shoulder and weighs up to 2,700kg. Its skin has great folds that look like plates of armour.

The Javan or Lesser one-horned rhinoceros is the rarest of all the rhinos. By end of 2016, there were just over 60 animals alive, in a single park in Indonesia. This rhino weighs up to 1,400kg and 1,7m at the shoulder.

The Sumatran or two-horned Asian rhinoceros is the smallest of all the rhinos at only 1,000kg and 1,5m tall. Unlike the other rhinos the Sumatran has quite a bit of hair covering its skin.



physical features of the African Rhinoceroses

Similar Physical Features of the African Rhinoceroses

Both African rhinos have two horns on the front of the face. The horn nearest the nose is normally the longest. Females will often have longer (though thinner) horns than males. The longest horn ever recorded on a black rhino was 136cm long. The longest for a white rhino was 158cm. The horns grow continuously at a rate of about 5cm per year. Normally it will be about 50cm long on an adult.

The horn is made from thousands of compressed hair-like strands. It is very similar to human fingernails. It is very tough but it does get worn down and can break off or split. If the horn is broken or cut off it will re-grow just like fingernails. Rhinos often rub their horns against trees and bushes. Since they will often use the same tree, eventually a smooth, well-rubbed site develops. Rhinos will use their horns for self-defence or to attack.

Rhinos have very **good hearing**. Even when sleeping the rhino's ears continue to listen for sounds of any movement nearby. They also have a very strong sense of smell. Like other wild animals, rhinos often sniff the air to find out what other animals are nearby. Normally if a rhino smells a human, it will run away.

Rhinos are thought to be **nearsighted** which means they can only see clearly objects that are close to them. The range of good sight is thought to be about 30m. Beyond that it is difficult for them to work out what they are actually looking at. Their poor eyesight helps explain why rhinos tend to move forward when they hear something. They need to get closer to see what it is.

Rhinos have very **thick skin**. On the hindquarters it can be as thick as 1.3cm. Some people say that a rhino's skin is so tough that it is like armour and can stop bullets. Unfortunately for the rhino this is not true. In fact, more rhinos are killed by bullet wounds than by any other cause of premature death these days. The skin on the soles of the feet is harder than anywhere else on a rhino's body. Rhinos have very little hair except for long eyelashes, a fringe of hair on the edge of the ears and a brush of coarse hair on the end of the tail.

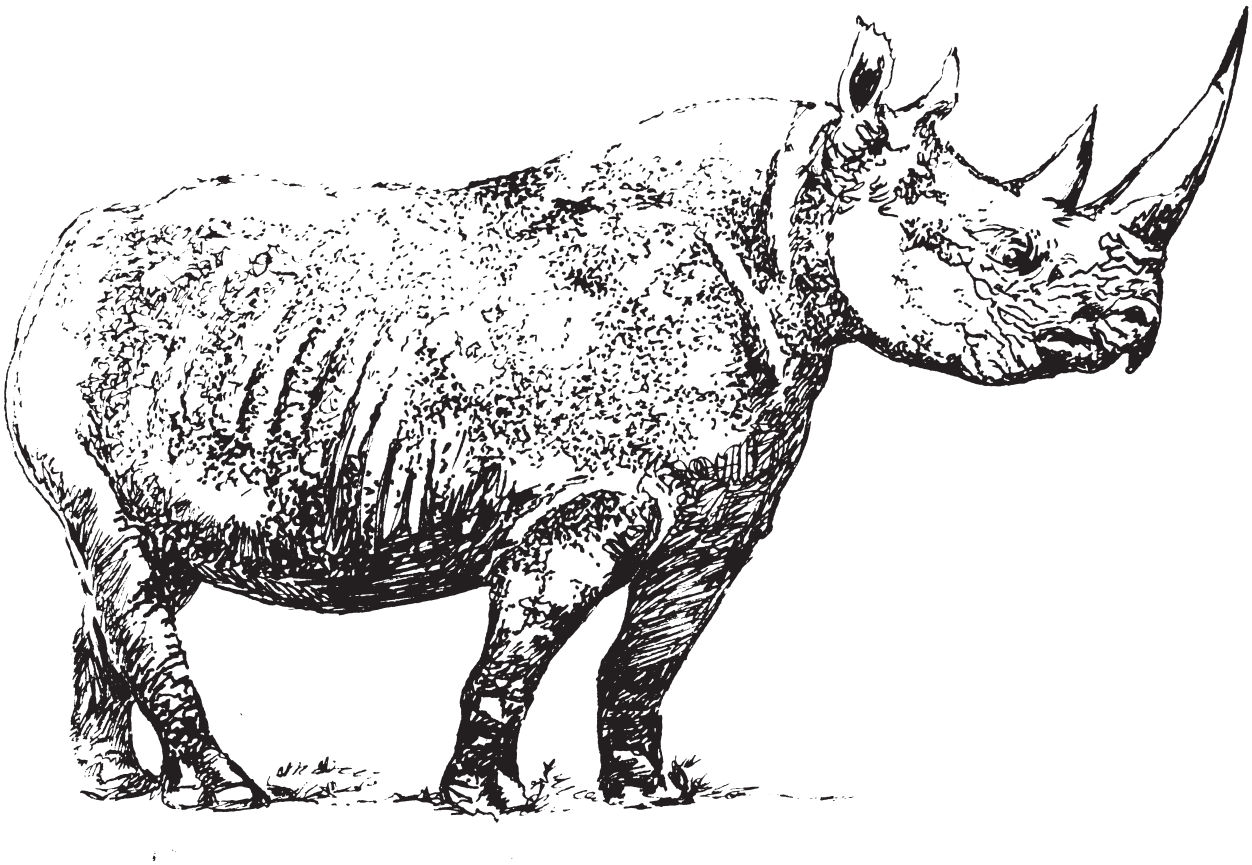
Rhinos' legs are very strong and flexible which makes it possible for them to move surprisingly quickly at times. The front legs carry more weight than the back legs. To help carry the weight the front feet are larger than the back feet. Bigger animals normally have bigger feet. It is often possible to tell from the size of the spoor if an animal is male or female, young or old.

There are **three toes** on each foot. These toes are short and large and each has a toenail on the end. The toenails often leave marks on the ground when the rhino walks. The marks that an animal leaves on the ground when it moves are called spoor. Rhinos can live to over 40 years old in the wild.

the African Rhinoceros

The Black Rhinoceros

The English name for black rhinos is confusing because it would have you believe that they are black in colour. This is not true. A black rhino's skin is actually grey. It may look black if it has been wallowing in mud but it may also look red if it has been rolling in red dirt. Black rhinos are also called **hook-lipped** rhinos. This name refers to the rhino's pointed upper lip.



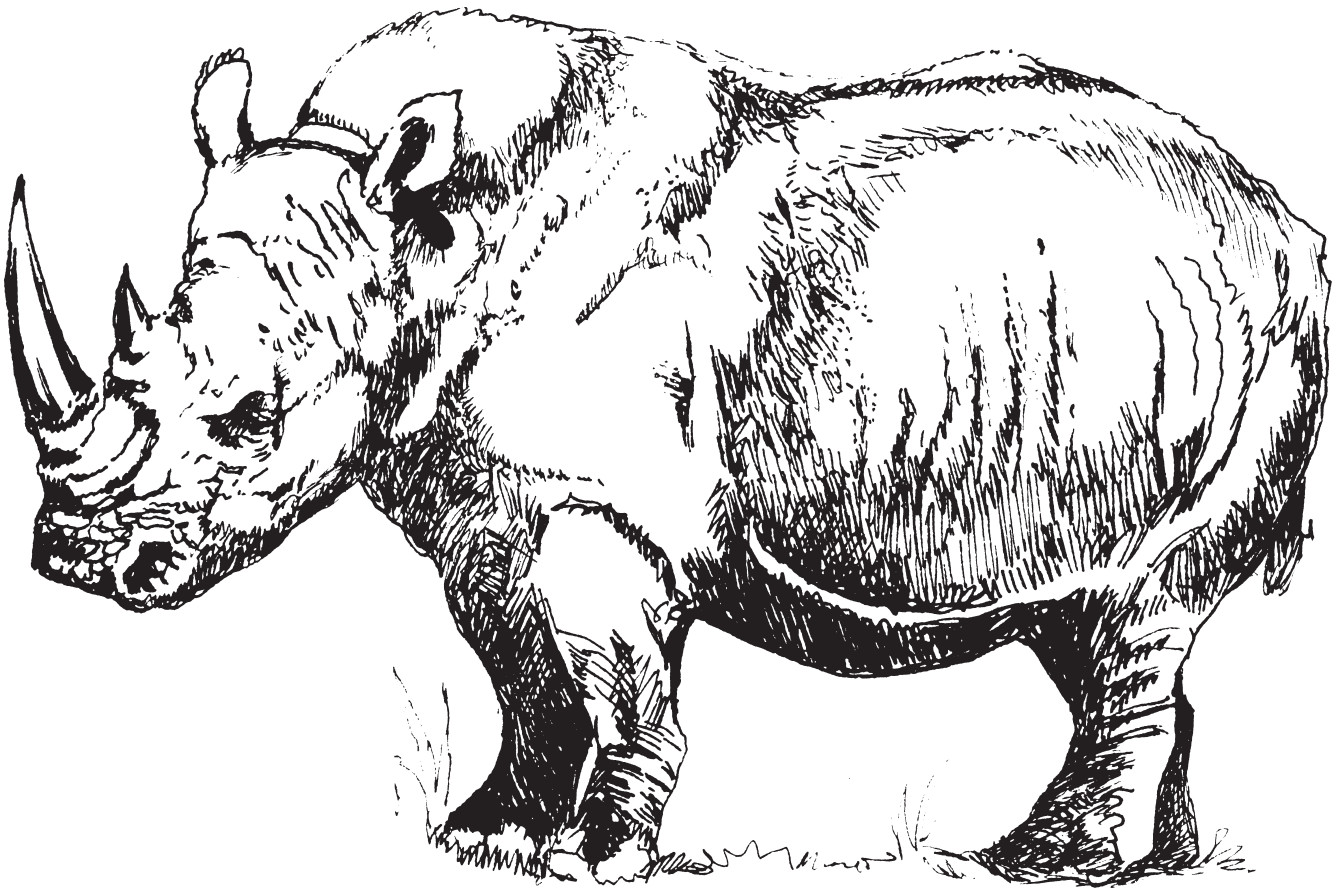
other names

Shona: **Chipembere, Nhema**
Ndebele: **Umhejane**
Venda: **Thema**

Scientific: ***Diceros bicornis***
Common: **Rhino**

The White Rhinoceros

White rhinos are also grey in colour. There are a few different ideas as to how white rhinos came to be called this name. Some people say it is because the English confused the Afrikaans name "weidt" for white. "Weidt" means wide in Afrikaans. They were probably referring to the rhino's wide upper lip. Other people say that the name was given because the first animal described had been rolling in white dirt and so it looked like it had white skin. White rhinos are also known as **square-lipped** rhinos.



other names

Shona: **Chipembere**
Ndebele: **uBhejane**
Venda: **Tshuguly**

Scientific: ***Ceratotherium simum***
Common: **Rhino**

different body features of the African Rhinoceroses

The Black Rhinoceros

Size Black rhinos stand on average at about 150cm at the shoulder. They are very heavily built and can weigh anywhere between 700 and 1,200kg – that is as much as 20 men!

Lip Black rhinos have a pointed upper lip. This lip is prehensile which means it is capable of gripping objects like fingers do. Black rhinos are browsers, which mean that they eat trees, shrubs and herbs. Black rhinos use their special lip to pull twigs and branches into their mouths so they can bite them off.

Head Because they feed on leaves and branches above the ground, black rhinos have a relatively short head and tend to hold it up.

Ears A rhino's ears are large and rounded in shape so that they can catch sound. The ears can be turned to listen in different directions. Black rhinos have very good hearing. Good hearing is very important for black rhinos as they spend most of their time in thick bush where it is impossible to see very far. The best way for them to work out what is going on around them is to listen.

Speed When a black rhino charges it can reach speeds of up to 55km/hr. This is much faster than any human. They are also very agile and capable of turning sharp corners very quickly.

Spoor The footprint of an adult black rhino is normally between 20-25cm across. The distance between steps can help tell you how big the rhino is. The distance between steps is called a **stride**.

different body features of the African Rhinoceroses

The White Rhinoceros

Size White rhinos can be as tall as 180cm at the shoulder. They are very large and can weigh up to 2,000kg. Today, white rhinos are the second largest land mammal in Africa after elephants.

Lip White rhinos have a square upper lip. They are **grazers,** which mean that they eat grass. The lip is used to pluck grass. Having a very wide mouth helps the rhinos eat more grass. Such a large animal needs to eat a lot of food.

Head White rhinos have relatively long heads that help to make it easier for the animal to reach down to the grass they like to eat. The head is carried low.

Ears White rhinos' ears are narrower but longer than those of black rhinos. They are also more tube shaped (not as open).

Speed When a white rhino charges it can reach speeds of up to 40km/hr for a short distance. This is very fast for such a large animal. Very few people are able to run as fast as a rhino over even a very short distance.

Spoor The front footprint of an adult white rhino is normally between 22-30cm which is larger than that of black rhino.

Behaviour of the African rhinoceroses

Areas that have the types of food rhinos like to eat and water for them to drink are called rhino habitats. A **habitat** is the natural home of an animal. Within the right habitat, each rhino likes to live within a part that they know. These parts of the habitat are called **territories** or **home ranges**. Rhinos tend to drink at the same water holes regularly. They even have regular places to sleep, often under a nice tree for shade. Most feeding is done during the cooler times of the day and at night. They use the same paths to move around the area they live in. In a black rhino's territory these paths become well worn and easy to identify through the thick bush that is usually their home.

Normally the most dominant bull in an area has his home range where the habitat is best. Other rhinos may come into his area to feed or drink but they will not stay. They will go back to their own home range to rest and sleep. The size of a home range depends on how much food is available. Where there is a lot of food the home range will be smaller than in an area where there is not a lot of food available, because the rhinos do not have to move so far to find enough food.

A rhino will mark its territory with its scent so that other rhinos know who it is and that this is its home area. Many animals use sound to communicate who they are and where they live. Birds do this by calling. Sound only works though when those you wish to communicate with are close by. Because the territories rhinos live in are so large, it is not common for them to be close enough to others to hear them. To overcome this, rhinos communicate with each other by scent. Scent markings last for long periods of time so any rhino that comes to that site, even days later, will be able to tell that another rhino has been there.

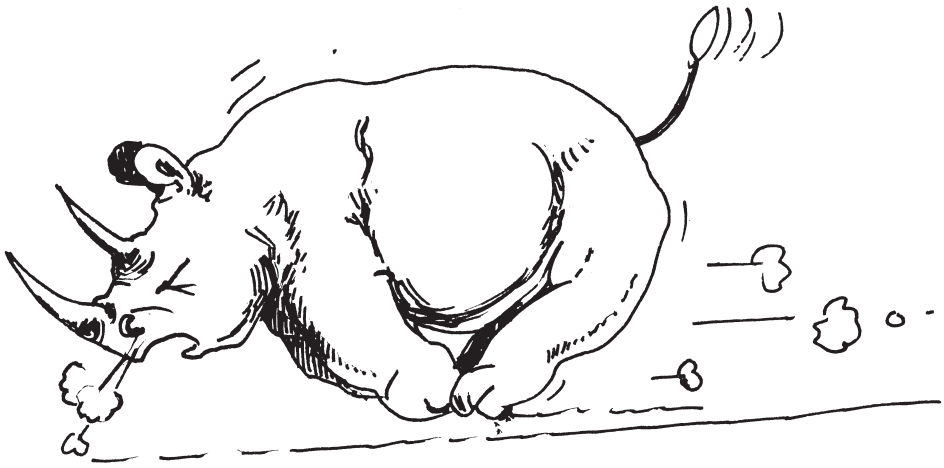
Rhinos make piles of dung that are called **middens**. More than one rhino may use the same midden. Where black and white rhinos live in the same area, both species sometimes use the same midden. Rhinos will drop dung in other places too. They scrape their hind feet in their dung to get the smell all over their feet. This scraping helps leave a strong scent trail wherever they walk. Males scrape their feet in their dung more than females. It is easy to see where a rhino has rubbed its feet in dung. These places are called **scrapes**. Middens and scrapes are two easy-to-see signs that indicate a rhino's presence.

Males mark their territories more than females. Middens and scrapes are more common towards the edges of the territories of males. Males also spray urine onto rocks and bushes around the outer edges of their territory. They do this to make sure other rhinos know this is where they live.

When a male rhino is in the territory of a more dominant male he will be submissive. When two males meet the non-dominant animal will back away. If they are not sure who is dominant they become tense, snort and paw the ground. They may sweep their heads back and forth and thrust their horns into the air in an effort to prove that they are the stronger of the two. If one does not walk away they may give a false charge to frighten the other away. If this fails it is usually the male that lives in the area that attacks the new rhino. He will lower his head, pull his ears back and make a screaming sound as he charges. Rhinos fight with their horns, using it to either stab or club the other rhino.

Females are not as aggressive when they meet. They may bump with their heads or the sides of their horns but they do not try to hurt each other. Rhino cows are very protective of their calves. Hyenas and lions sometimes attack young rhinos. A rhino that is missing part of its ear or tail was probably attacked while it was young. A rhino cow is known to have killed a lion that tried to attack her calf.

An adult rhino has no natural enemies. Most rhinos are killed by people. Both rhinos are naturally curious animals and are known to walk towards sounds that interest them. Rhinos are known to **charge** people that get close to them. The best and easiest way to avoid being charged by a rhino is to keep away from them. Rhinos like to stay in the same area, walk the same paths and drink at the same place. It is normally easy to identify these places and avoid walking there. If you have to walk through these areas and find yourself close to a rhino, try to stay very still and quiet. Often the rhino will run away. If the rhino thinks you are too close, it will think you are a threat and will charge. The best thing to do is quickly climb a tree or get behind a bush or rock. Often a rhino will rush past you and keep on going because they are frightened by you and want to get away.



Rhinos like to **wallow** in mud to help keep their skin healthy. The mud cools the rhino down in hot weather and protects the skin from sunburn. Wallowing also helps control skin parasites like ticks and lice. Others, like ticks, are pulled off as the mud dries and is rubbed or flakes off. Rhino will also roll in dry dust baths. Rolling is a way of scratching itches. Because rhinos are so large it is easy to see where they have been wallowing or rolling. This is one of the ways to tell if a rhino lives in the area.
When it is hot and dry, rhinos like to **drink water** every day so they will stay within 5km of water if possible. However, rhinos can go several days without drinking water.

different behavioural features of the African Rhinoceroses

The Black Rhinoceros

FOOD Black rhinos are **browsers.** They browse on woody shrubs and small trees. They will also eat wild berries and other fruits. Sometimes they will eat grass when they are eating other plants close to the ground. Black rhinos are big animals so they need to eat a lot of food. They usually eat more than 23kg of vegetation every day. They also need to be able to eat a variety of different plants so that they get all the nutrition they need.

HABITAT Black rhinos can be found in many different habitats. They like to live in **wooded areas** because they can find more food and shelter in these places. The highest concentrations of black rhinos in Zimbabwe are found in the lowveld where there are lots of trees and shrubs. Some black rhinos have adapted to living in the deserts of Namibia.

TERRITORY Where there is a lot of food, like in parts of South Africa, territories may be as little as 260 hectares. If there is only a little food, like in the desert, as much as 13,300 hectares may be needed for one rhino to find enough to eat.

BEHAVIOUR Black rhinos are thought to be bad tempered and aggressive. Part of the reason for this is that often when people and black rhinos meet it is by mistake, in the thick bush that these rhinos love to live in. Naturally both the person and the rhino are surprised when they meet each other under such conditions. When a black rhino gets a fright its response is to return the favour and give whatever has frightened it a fright back. This they do very well by charging. Black rhinos are like people in that they each have their own personality. Some are friendly and curious. Others can be grumpy and bad mannered.

different behavioural features of the African Rhinoceroses

The White Rhinoceros

FOOD White rhinos are **grazers.** They graze on grass. White rhinos like to eat short grass but will eat long grass if it is all that is available. White rhinos are very big animals so they need to eat a lot of food. Their wide lip helps them get a lot of grass into their mouths with each bite. Even with such a wide mouth white rhinos spend half of their life eating to feed their massive bodies. It is not uncommon to find groups of white rhinos grazing together. This is possible because the grass they eat is normally concentrated and plentiful so there is little competition for food.

HABITAT White rhinos live in **savanna bushveld** where there is plenty of grass available for them to eat.

TERRITORY Territories vary in size from 200 to 500 hectares depending on the availability of food. White rhinos are more territorial than black rhinos. Only the dominant male scent-marks the territory. He will share this territory with one or two subordinate males. Dominant males behave as subordinates when outside their own territory. This normally occurs when a dominant male must leave his own area to drink. He will not spray urine while he is out of his home territory. Generally only the dominant male mates with females and he will try to keep breeding females inside his territory.

BEHAVIOUR White rhinos are considered to be not as aggressive as black rhinos. In part this is due to the different habitats they live in. In the savanna, where white rhinos live, it is easy to see a rhino at a great distance so the chances of getting too close to one without knowing it are very low. The more open country makes it easy for the rhinos to see people approaching and so there is plenty of time for them to move away if they wish. White rhinos do charge at times.

Rhinoceros Reproduction

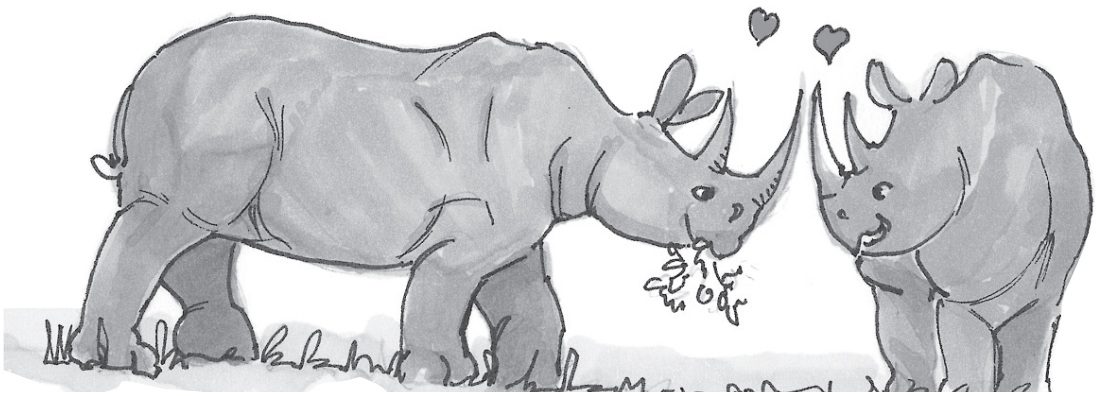
The rate of reproduction is an important factor for wildlife survival. Animals that are frequently eaten by predators, like impala and warthog, are relatively small in body size. This is why they are easy for the predators to kill. But because they are relatively small they can reproduce quickly. They breed every year and can produce more than one young each season. In this way these species survive by producing lots of new animals to replace the ones that are killed. Animals that are generally not eaten by predators, like the rhinoceros and the elephant, are often larger animals. These big animals take much longer to reproduce. They do not reproduce every year and they can have only one calf at a time. These species maintain their population numbers by having a high survival rate rather than a high reproduction rate.

Rhinos can breed at any time of the year. Females become sexually mature between the ages of five and eight. Males mature at about eight years of age but often do not breed successfully until they are 10-15. This happens because the younger bulls must compete with older, more established bulls for females.

When a female is ready to breed, an adult male will join her and they will form a temporary group. In black rhinos, a pregnancy lasts for 15 months. For white rhinos, it lasts for 16 months. A healthy cow normally produces a calf every two and half years. If conditions are very good she may have a calf every two years. If the habitat is not so good or she is getting old, three years or more may be the average.

A rhino calf can stand up an hour after it is born and is able to walk within two hours. A black rhino calf can weigh as much as 45kg at birth. A calf will suckle milk from its mother for up to two years. A young rhino will stay with its mother after it is weaned. When a calf is between the ages of two and five, it will be forced to leave its mother when she mates or when a new calf is born. The calf will often join other calves and sub adults or a single female until it is full grown (about seven years). Sometimes a calf will return to her mother once she has been mated or has had her new calf and the three will live together for some time.

Rhino cows are very protective of their calves. Cow and calf normally stay close together. When moving a black rhino calf follows its mother. This is done so that the calf can walk more easily through the thick bush along the path created by the mother. Another possible reason for this habit is that if the pair bumps into a predator in the thick bush the mother is in front and able to protect the calf. Sometimes a black rhino cow will leave her calf hidden while she goes to drink or browse. With white rhinos the calf moves in front of the cow. Because they live in more open country any potential threat to a calf can be seen at a distance and the pair can move off together. If the predator chases them the mother is behind and in a position to protect her calf.



Rhinoceros Populations

Population history

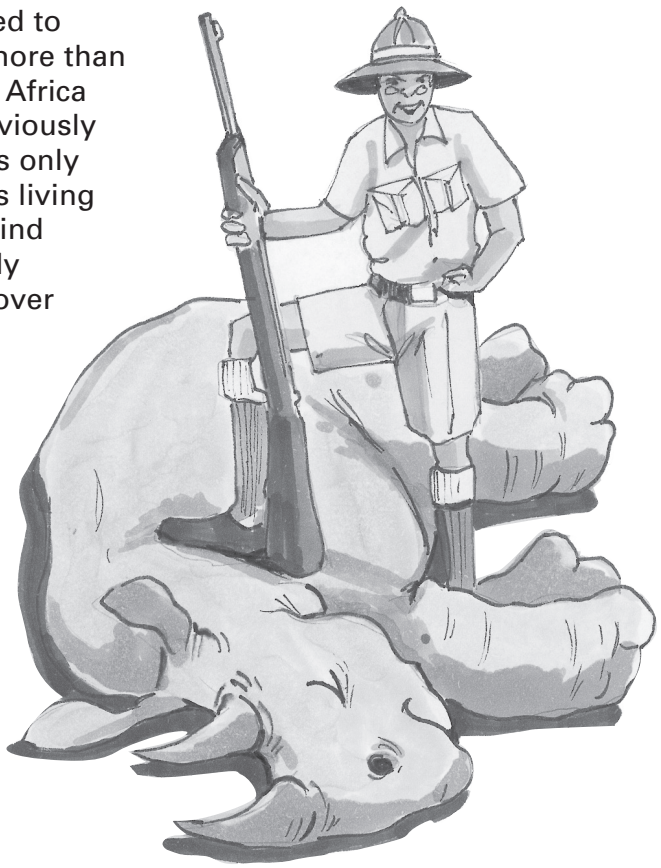
Less than 200 years ago vast herds of animals roamed all over the African landscape. People hunted wild animals for food and their skins but the numbers of people were few and therefore so were the number of animals they killed. The wild animals could reproduce quickly enough to replace the ones that were killed and so a balance existed.

Over time, with the introduction of western medicines and technology, the number of people living in Africa increased. The growing population needed to kill a growing number of animals for food. Also, the Europeans who came to Africa with their rifles indulged in their passion for hunting. In the early days of the white man in Africa the wildlife resources seemed endless. Large numbers of animals were killed for sport.

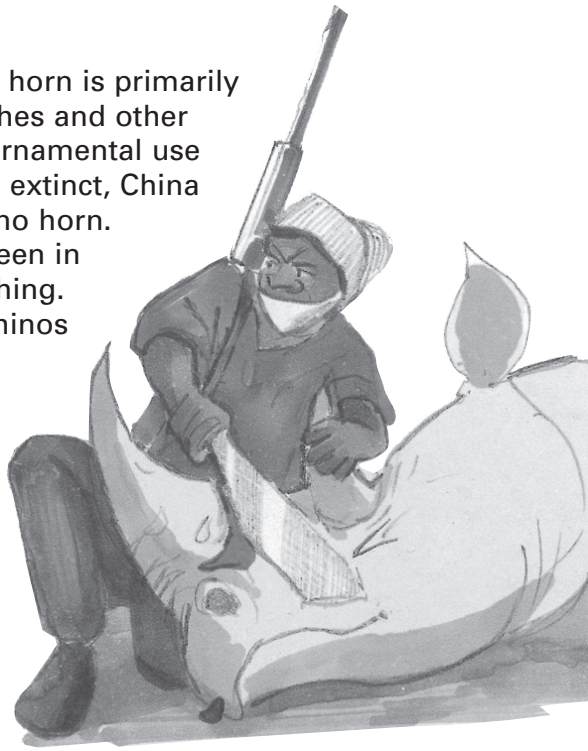
Skins, tusks and horns were taken to trade overseas. Now, instead of there being a balance, the populations of wild animals started to decline. In addition to the increasing hunting pressure the people, both black and white, kept taking more and more land for their fields and livestock, leaving less and less land for the wild animals to live on. For some species the dual pressure of increased hunting and reduced areas to live in was too much. Animals like the quagga, a relative of the zebra, and the blue antelope became **extinct**. They were hunted until the very last one of their kind was killed.

The African rhinoceros, being a slow breeder and relatively easy to hunt, is now also in serious danger of becoming extinct like the quagga. They have been shot as hunting trophies, for meat and to clear land for farming. Their skins have been used for shields and good luck charms. Their blood, urine, bones and dung have been used in traditional medicines in Asia. In more recent times it is the foreign demand for rhino horn that has caused Africa's rhinos to be slaughtered to the point of near extinction.

In the early 1800's, there were thought to be more than a million black rhinos living in Africa. This population was reduced to approximately 65,000 by 1970. Over the next 25 years more than 95% of the remaining black rhinos were killed. By 1995, Africa had only 2,410 black rhinos left. Vast areas that had previously been home to thousands of rhinos now had populations only numbering in the hundreds or less. With so few animals living in such large areas it became difficult for the rhinos to find mates to breed with. Some countries remained with only two or three rhinos. Such small populations cannot recover because of in-breeding problems. Africa's black rhinos were heading straight for extinction. Due to careful management and protection, Africa's black and white rhinos experienced a period of recovery, until about 2008 when another wave of poaching started to threaten the species across eastern and southern Africa. By end of 2015, there were just 5,261 black rhinos and 20,584 white rhinos in Africa.



The Rhino horn trade



The demand for rhino horn comes from **Asia.** In China, rhino horn is primarily used for **traditional Chinese medicine** to treat fevers, headaches and other illnesses. Furthermore, Chinese dynasties have a history of ornamental use of rhino horn. In an effort to help stop rhinos from becoming extinct, China changed its laws in 1993 to make it illegal to use or trade rhino horn. This, combined with the international trade ban which had been in place since 1977, resulted in a massive decline in rhino poaching. With less rhinos being killed for their horns, the number of rhinos in Africa started to increase again.

Rhino poaching in Africa increased again in 2003 when Viet Nam became a rhino horn consumer country. This new illegal trade involved organized crime syndicates. Viet Nam is a direct neighbor to China and shares many traditional medicine practices – including the use of rhino horn. In addition to being used for fevers, modern use includes the belief that rhino horn can help cure hangovers. Increasingly horn is being used as a status symbol to show how wealthy you are and used as a gift to impress others. Horn is also being used to make jewellery. The illegal horn trade has now spread back into China.

To be able to trade in rhino horn you need to know who to buy it from and who to sell it to. The person who knows these things is often called the "middleman". He normally makes the most money but does the least work and takes the least risks.

The middleman buys the horn in Africa from a rhino poacher. A rhino poacher normally moves into an area where there are rhinos and asks the local people to help him. He needs them to give him shelter and tell him where the rhinos live and how they are guarded, so he can find them and kill them with least risk to himself. Rhino poachers often use rifles to shoot the rhinos when they come to drink at their favorite water holes. Sometimes wire snares are used to catch rhinos. Once the rhino has been killed the poacher leaves the area to avoid getting caught. The community is often left to take the blame for killing the rhino and the people end up in bad relations with their neighbours and the authorities.
The poacher sells the horn to the middleman. The middleman pays the poacher a fraction of the value of the horn. The horn is then taken overseas and sold for many times more than what the poacher was paid. Even this selling price is insignificant compared to the value of a living rhino in a healthy rhino population (see Rhino Rewards).

Over time, as more and more rhinos are killed, the population starts to get smaller and it becomes harder for the poacher to find rhinos to kill. When this happens the middleman and the poacher simply move to another area that still has rhinos and kill them until the same thing happens again. If the rhino poacher is caught and taken to jail the middleman does nothing to help him. He will not risk getting caught because it is also illegal to trade in rhino horn. The middleman simply finds another poacher to kill for him.

The Threat of Extinction

The demand for rhino horn from Asia has encouraged Africans to destroy their own rhino populations. Today, the black rhino is a **critically endangered species.** This means that black rhinos are facing a high risk of extinction in the wild in the near future.

Rhinos are not the only species facing extinction today. The human population of the world is becoming dangerously large and the demand for resources, be it horns, meat, or wood, is growing with that population. As the human population grows, the demand for land to grow food is also growing. The space available for wildlife is rapidly diminishing. The human population of the world by the end of 2017 was about 7.5 billion. That is 7,500,000,000 people. The populations of many species are becoming dangerously low in numbers. By end of 2017, at least 16,000 different species were threatened with extinction.

Many people are very worried about the fact that the planet is losing so many species. It has taken millions of years for these different species to develop and we know very little about the roles they play in the natural processes of our world. It is not only animals, but people too that depend on these natural processes. Scientists understand that environments that have a large number of different species in it are much healthier and more stable than environments with fewer species. By allowing more and more species to become extinct, we are weakening the health and strength of the very environment we all live in. By protecting the species we share our environment with, we are also protecting ourselves. Every species plays a unique and special role in our world and we are all dependent on each other for our survival.

Rhinos play a number of different and important roles in maintaining a healthy and productive environment. White rhinos create grazing "lawns" from which the coarse, tall grass is eradicated, which stimulates the growth of fresh green grass that supports other animals. Black rhinos play an important role in recycling nutrients by eating twigs and stems that are too coarse for other animals to eat. They return parts of these twigs and stems to the soil in their dung. The dung supports many different types of fungi and dung beetles, which further break down the twigs and branches, releasing nutrients back into the soil. In this way the rhinos dung enriches the nutrient content of the soil, making it possible for more plants to grow.

Rhinos also help trees by eating their seeds. Trees with strong seedpods, like the baobab and the sausage tree, reproduce with the help of rhinos. The seeds pass through the gut of the rhino and then come out in the dung. Because the rhinos move around the seed is deposited away from the parent tree. The dung acts like fertilizer and helps the new plant grow. This is good for the environment because it helps maintain both the diversity and number of trees.

Rhino Conservation

Historically, almost every sub Saharan country had rhinos. By the end of the 1800s the white rhino was extinct in every single African country except South Africa. The heavy poaching for horns in the 1970s and 1980s exterminated all the black rhinos in a number of countries, including Angola, Botswana, Malawi and Zambia. Fortunately people realized before it was too late that the number of rhinos being killed was excessive and huge effort has been made to save both the black and white rhinos from extinction.

To help control the international demand for rhino horn, both species of rhinos were placed onto CITES Appendix I in 1977. CITES stands for the Convention on International Trade in Endangered Species. An Appendix I listing makes it illegal to trade in any part of the listed species. Many local and international agencies work to identify and arrest people trying to trade in rhino horn. TRAFFIC, the wildlife trade monitoring network, monitors the changing trends in the international trade in rhino horn.

Efforts are being made in the countries that buy the horn to make people aware that the horn they purchase is driving the rhino populations in Africa to extinction. These demand reduction campaigns have met with some success, but there is still a long way to go. There is certainly little evidence to support the notion that rhino horn has special qualities.

The countries that still have rhinos have changed the way they manage their rhino populations to improve their protection and reproduction.

Many countries have made it **illegal to kill a rhino** without a permit from the government. **Penalties** for killing a rhino are very severe in an effort to make rhino poachers realize what a serious crime it is to hunt a species to extinction. Mandatory jail sentences are common. In Zimbabwe, the penalty for killing rhinos or possession of rhino horn is a mandatory sentence of nine years. These sentences reflect the reality that killing a rhino is not just killing a single animal, it is threatening the survival of an entire species, and represents an economic crime against the country.

Some governments have a shoot to kill policy for poachers found inside rhino areas because these poachers carry guns that they also use to kill the people protecting the rhinos. Zimbabwe's rhinos are classified as a **Specially Protected Species.** This has been done to help give the rhinos the protection they need for their numbers to build up again. A poacher that kills a Specially Protected Species receives harsher penalties than other poachers. Other Specially Protected Species in Zimbabwe are the aardwolf, bat-eared fox, cheetah, gemsbok, lichtenstein's hartebeest, pangolin and the python.

Many people think that someone who kills a rhino is just making a bit of money for himself. This is not true. The reality is that rhino poachers are stealing from everybody.
The country, through its government and other organizations like non-governmental organizations, puts a lot of effort and money into protecting rhinos so that the species can be made safe from extinction. Once the rhinos are safe again the nation as a whole can enjoy the economic and environmental rewards that come from successful conservation (see Rhino Rewards). As long as poachers are allowed to kill rhinos and the species remains at risk of extinction, we all continue to carry the cost.

Communities that live close to rhino populations are in an important and powerful position. The people that live in these communities are able to play a direct role in saving Africa's rhinos. In many ways it is the most important role of all because the people that live close to rhinos are able to stop poachers BEFORE they kill a rhino. As we have discussed earlier, rhino poachers use the local people to help them kill rhinos. If the people refuse to help, it makes it very difficult for the poacher to succeed.

A rhino poacher needs to live in the community while he is finding out where the rhinos are. The community should be suspicious of strangers who want to know where exactly the local rhinos live and drink. If you think there is a rhino poacher in the area, it is a good idea to tell the local authorities. This could be the police, national parks or conservancies, local scouts, teachers or community leaders. By making it known that there is possibly a rhino poacher in the area the authorities are given an early warning and the security for the rhinos can be increased. People can be on the lookout for unusual behaviour like signs of poachers going into rhino areas, people with rifles or heavy wire snares. By helping the authorities in this way the community is not only protecting the rhinos but also themselves. Communities that help stop and catch rhino poachers often have better relationships with the authorities and their other neighbours. In addition to good relations, local schools benefit from more education inputs as less donor funds are allocated to enhancing rhinos' security leaving more for schools.

Not all rhinos are killed by outside rhino poachers though. It is not uncommon for rhinos to get caught in snares made to catch other wildlife. It is very difficult to control this illegal snaring because many snares are placed in the bush over large areas. Because the rhino is so big it is normally able to break the wire free from the tree but the snare stays on the leg or neck. If the wire is not removed a large wound develops and eventually the rhino dies. It costs about US$3,000.00 to find and treat a rhino that has snare wounds. Local communities can do a lot to stop rhinos from being killed or wounded by snares.

Most people that live close to rhinos know which paths the rhinos like to use and where they often drink. Setting snares in rhino home ranges, especially on rhino paths is a waste of effort on the poacher's part. Snares that are set in these places are very likely to be carried away by a rhino so the poacher gets no meat, loses his snare and risks killing a rhino. Removing snares set in rhino's home ranges saves rhinos' lives. It is vital to report any unusual spoor sightings. A rhino that has a snare wound often drips blood as it walks. If the wound is bad the rhino may have trouble walking and drag its leg. The earlier the snare can be removed the better the rhino's chances are of surviving.

White rhino conservation

The southern white rhinoceros is the most abundant subspecies of the rhino in the world. The subspecies live in grasslands and savannahs of southern Africa, ranging from South Africa to Zambia. About 99% of southern white rhino occur in just five countries (South Africa, Namibia, Kenya, Zimbabwe and Botswana). The species was nearly extinct with less than 20 individuals in a single South African reserve in the early 20th century. Its recovery from very near extinction is one of the great conservation success stories of the world. The small population was given very tight protection and slowly recovered. In 2001, it was estimated that there were 11,670 white rhinos in the wild of southern Africa with a further 777 individuals in captivity worldwide, making it the most common rhinoceros in the world. By the end of 2007, wild-living southern white rhino had increased to an estimated 17,502 animals and by the end of 2015, the southern white rhino population was over 20,000.

Black rhino conservation

Even with all the efforts being made to stop the trade in rhino horn, the population of black rhinos continued to decline into the 1990s. It was very difficult to give the black rhinos the protection they needed because they live in such vast areas in countries that at the time were facing both economic and political instability.

Zimbabwe was home to the largest population of black rhinos in 1980, when between 1,300 and 1,400 black rhinos lived in the Zambezi Valley. The long river border with Zambia, where many of the poachers came from, was impossible to control and the decision was made that to effectively protect the remaining rhinos they needed to be moved away from the Zambezi Valley.

Under the national conservation strategy black rhinos were captured and translocated (moved) to various internal areas where it was felt they could be better protected from poachers. Some rhinos were moved into **Intensive Protection Zones (IPZs)** within National Parks. Government anti-poaching resources were concentrated on protecting these areas. Some black rhinos were moved onto private land in conservancies where the landholders undertook to protect the rhinos. This is known as a **custodian scheme.** To provide better protection and more area for the rhinos some landholders joined their properties together to form **conservancies**. The protection provided in the IPZs and conservancies reduced the poaching and the rhino populations started to grow. By 2007 the national population was over 558 black rhinos from a low point of only 370 in 1993. By end of 2015, the national population was 471 black rhinos.

Increasing rhino populations

One of the strategies used to help increase number of rhinos quickly is to maximize the rate of reproduction. Rhinos are relatively slow breeders - if a population of 100 animals increases by eight in a year the population is considered to be breeding well. One of the best ways to keep the rate of reproduction high is to have plenty of food available for all the animals. Well-fed rhinos start to breed at an earlier age and calve more often. In the lowveld conservancies, many black rhino cows have their first calves at six and a half years of age. In other areas where the food is not as plentiful, cows often do not start breeding until they are over seven and a half years. Better fed rhinos also calve more often. Rhinos in suitable habitat can have a calf every two and half years.

When rhino numbers build up in an area they can start to compete for food and this competition reduces the rate of breeding. To reduce competition for food rhinos are moved away. These animals are used to start a new breeding population in a new area and so help increase the number of rhinos overall.

Monitoring

To know accurately how many rhinos are in a population they must be monitored. This involves regularly checking on every rhino in the population to confirm they are alive and how well they are breeding. Every black rhino should have a record of when it was born, whom its mother is and where it likes to live (its home range). Most rhinos even have names given to them by the specially trained rhino monitors who check on them. By collecting this information it is possible to work out if the population is increasing as well as it should.

Poaching

Since 2002 there has been an increase in targeted rhino poaching driven by the illegal Asian rhino horn trade. The poaching crisis ramped up in 2008, with Zimbabwe losing over 200 rhinos in just two years from 2008 to 2009. While Zimbabwe has mostly been able to slow this poaching, losing over 244 rhinos from 2010 to 2015, South Africa has lost over 5,000 rhinos from 2008 to 2015. If this rate of rhino poaching is not controlled, rhinos and the rewards they bring could be wiped out.

Rhinoceros Rewards

At the national level, rhino rewards are realized through tourism. Tourism is an important part of Zimbabwean economy. Tourism earns valuable foreign currency and creates many jobs. There are the scouts who protect the rhinos and other animals, the guides who help the visitors find **the animals**, the managers, cooks, waiters, housekeepers and gardeners who run the hotels and lodges. Wild black and white rhinos can only be found in Africa and are a major tourist attraction. The rhinoceros is one of the "Big Five" along with elephant, buffalo, lion and leopard. Nowhere else in the world is it possible to see such large and impressive animals living together in the wild. Africa's exciting wildlife attracts visitors from all over the world. Countries like Zimbabwe with healthy wildlife populations have potential to attract the most tourists. If poaching is not controlled and animals like the rhinoceros are wiped out tourists will not come and the money that they bring with them will also be lost.

As a strategy of delivering tangible rewards from rhino conservation success in Zimbabwe to the rural communities adjacent to Save and Bubye Valley Conservancies, the Lowveld Rhino Trust is implementing a “rhino production incentives scheme” in rural communities within a 10 km buffer of lowveld conservancies. The entry points are primary schools within the target communities. The “rhino production incentives scheme” is performance-based. It allocates funds from a pot to community support or to conventional anti-poaching needs according to the rate of rhino population growth achieved in the year. The higher the growth rate, the more funding that flows to the community incentives; the lower the growth rate, the more that is allocated to primary rhino protection measures.
The community support is given in the form of inputs to schools. Funds that are raised by the Lowveld Rhino Trust for the incentives scheme are allocated annually according to the following schedule, in which population growth is the net increase in the year of both species of rhinos (combined) within the conservancy.

Net annual rhino population growth in a year	Proportion of available funds allocated to:	
	Security Inputs	School Inputs
7%+	50%	50%
6%	55%	45%
5%	60%	40%
4%	65%	35%
3%	70%	30%
2%	75%	25%
1%	80%	20%
0% or minus	85%	15%

The Future of Rhinoceroses in Africa

If rhino poaching is controlled rhino populations will increase. Healthy, increasing rhino populations help attract visitors. Along with the financial and employment benefits that come with tourism, these nations can be proud that they have been successful where so many others have failed. Instead of letting yet another species vanish from the face of the Earth, Africa can win the fight against poachers and bring the rhinoceros back from the brink of extinction. What we need to do is unite against those who continue to poach rhinos for their own selfish gain so that we can all enjoy the rewards that come from protecting and maintaining a healthy and diverse environment.

GLOSSARY

ATMOSPHERE: It is a mixture of gases that surrounds the earth.

BROWSER: A herbivore that feeds on parts of plants such as leaves, twigs or small branches.

CONDENSATION: The process whereby water vapour cools down and forms liquid.

DEHORNING: Term used to describe the removal of most of a horn from an animal.

ENDANGERED SPECIES: A species of an animal or plant that is seriously at risk of extinction.

EROSION: The wearing or grinding something down usually by wind or water.

EVAPORATION: The process when a liquid turns into gas.

EXTINCT: When a species no longer has living members.

FREEZING: The process whereby a liquid turns into a solid, e.g. when water turns into ice.

GESTATION PERIOD: The length of time a female is pregnant with young.

GRAZER: A herbivore that feeds on grass.

GREENHOUSE GAS: Gas that traps heat from the sun in the atmosphere which leads to an increase in the world's temperature.

HABITAT: The environment where a plant or animal naturally occurs.

HERBIVORES: Animals that eat plants.

HUMUS: The decomposed plant and animal matter that adds nutrients to the soil.

KERATIN: A tough fibrous protein that looks like compressed hair. Fingernails and rhino horns are made of keratin.

OMNIVORE:	An animal that eats both animal's meat and plants, e.g. baboon.
MELTING:	The process whereby a solid changes into liquid, for example when water ice turns into water.
PARASITES:	Organisms that use other organisms to benefit themselves at the expense of their hosts.
PHOTOSYNTHESIS:	The process whereby plants produce their own food from carbon dioxide, water and sunlight.
POACHING:	A type of hunting that is against the law.
POPULATION:	Total number of things (plants or animals) in a given place.
PRECIPITATION:	All forms in which water moves from atmosphere to earth i.e. rain, snow, hail or sleet.
PREDATOR:	An animal that hunts, kills and eat another, e.g. lions, leopard and cheetah.
RESPIRATION:	The process of absorbing oxygen and giving off carbon dioxide.
TRANSPIRATION:	The process where plants absorb water through the roots and then give off vapour through pores in their leaves.
TRANSLOCATION:	The capture and moving of a wild animal from one area to another.

IUCN Categories of Threat

The black rhino is classified by the IUCN (International Union for Conservation of Nature as CRITICALLY ENDANGERED. The IUCN have a RED LIST of taxa that are facing the threat of extinction.

There are nine categories of threat:

1. **EXTINCT (EX)**

   There is no reasonable doubt that the last individual of this taxon has died.

2. **EXTINCT IN THE WILD (EW)**

   A taxon is extinct in the wild when it is known only to survive in captivity.

3. **CRITICALLY ENDANGERED (CR)**

   A taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future.

4. **ENDANGERED (EN)**

   A taxon is endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future.

5. **VULNERABLE (VN)**

   A taxon is vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the near future.

6. **NEAR THREATENED (NT)**

   A taxon is near threatened when it is not Critically Endangered, Endangered or Vulnerable status but is likely to qualify for a threatened category in the near future.

7. **LEAST CONCERN (LC)**

   A taxon is least concern when it is not Critically Endangered, Endangered, Vulnerable or Near Threatened status.

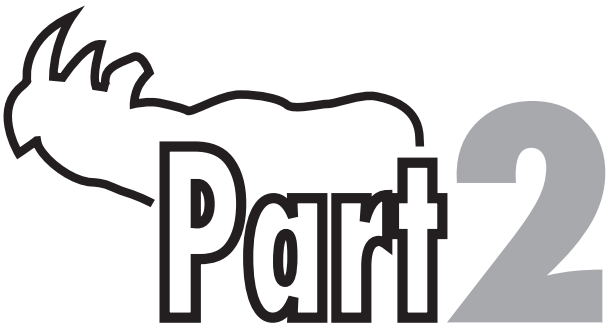
8. **DATA DEFICIENT (DD)**

   A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status.

9. **NOT EVALUATED (NE)**

   A taxon is Not Evaluated when it has not yet been assessed against the criteria.

card guide



This section is intended to help guide teachers in the use of the Rhino Cards. Most of the cards have been developed to help teach specific subject units, topics and themes in the updated Environmental Science curriculum though teachers should feel free to use them for other subject as well. The cards may also be used to teach at different grade levels by adding detail from Part One of the Guidebook. The suggestions made here are by no means exhaustive. It is hoped that they will act as a starting point for teachers who should feel free to use the cards as they see fit.

card summary

CARD	TITLE	CONCEPT IN UPDATED CURRICULUM
1a	Wild animals live in the environment	Wild animals in the environment
1b	Wild animals live in the environment	Wild animals in the environment
2a	Black rhinos - facts	Plants, habitats, Populations of wild animals
2b	White rhinos - facts	Plants, habitats, Populations of wild animals
3a	The rhino horn - poaching	Poaching and Populations
3b	Rhinos reproduction	Animal Reproduction and Populations
4a	Land for wildlife - uses	Wild animals in the environment
4b	Rhinos protection	Wild animals in the environment
5a	Habitat	Habitats, Deforestation, Climate change, Soil erosion
5b	Territories	Territories, Home Range
6a	Rhino poem	English reading ability and understanding
6b	Rhino story	English reading ability and understanding
7a	Addition and subtraction	Mathematics arithmetic operators
7b	Multiplication and division	Mathematics arithmetic operators
8a	Body/behaviour features	Comparing and contrasting features
8b	Glossary	Definitions of terms for Environmental Science subject

CARD 1a

WILD ANIMALS LIVE IN THE ENVIRONMENT

This card can be used when explaining the concept of different WILD ANIMALS IN THE ENVIRONMENT as needed in the updated curriculum. Ask the students to identify all the animals in the drawing. They should be able to see the elephant, buffalo, rhino, lion, leopard, crocodile, kudu and giraffe.

Which wild animals are members of the big five in the environment? Ask the students to describe the animals in the photos. Young students may simply describe what the animals look like. Older pupils should consider what the animals eat, where these animals live and how they behave.

Make a list on the board of the features the children describe and then ask them identify which animals have the same features and which animals have different features.

It is not common to actually see wild animals. Most wild animals are shy and run away from humans. It is much more common to see where animals have been by the tracks they leave on the ground.

Take the class outside and let the students look for tracks and other signs of wildlife. Let the students experiment with making their own tracks in different surfaces (soft sand, fine soil, rock etc.). Ask them to work out which surfaces are good for making tracks in and which ones are not. Help them use this information to work out where it is best to look for tracks.

There are many different ways of investigating what animals are living in the environment. Encourage the students to use all their senses to find out about their environment.

What animals do they see? Elephant, buffalo, lion, rhino and giraffe.
What animals do they hear? Birds, jackal, lion, leopard.
What sign (tracks and dung) do they find? Rhino and snake tracks.
What animals do they smell? Waterbuck, wildebeest.

Using more of your senses will help you find out more about what animals are living in the environment. Especially animals that are rare like the black rhino.

CARD 1b

WILD ANIMALS LIVE IN THE ENVIRONMENT

This card can be used when explaining the concept of different WILD ANIMALS IN THE ENVIRONMENT as needed in the updated curriculum.

Which wild animals are members of the big five in the environment? Ask the students to describe the animals in the photos. Young students may simply describe what the animals look like. Older pupils should consider what the animals eat, where these animals live and how they behave.

Make a list on the board of the features the children describe and then ask them identify which animals have the same features and which animals have different features.

It is not common to actually see wild animals. Most wild animals live in the wild so people do not often see them. It is much more common to see where animals have been by the tracks they leave on the ground.

Work through the card with the students and discuss each of the different signs the Big Five Animals leave in their environment.

Spoor is another name for tracks. When Big Five animals walk they often leave behind marks in the ground. These marks are large and easy to find if the soil is soft.

Ask the children to look for signs of wild animals on their way to and from school. In the morning make a list of the different wild animals the students discovered and how.

CARD 2a

BLACK RHINOS - FACTS

This card can be used as media when teaching the concepts of PLANTS, HABITATS, and POPULATIONS OF WILD ANIMALS as needed by the updated curriculum. This card provides detail information of black rhino. Work through the cards with the students and help them understand the different features on the black rhino.

Teachers are encouraged to use Part One of the Guidebook to help teach this lesson. Additional information can be introduced to match the level of detail the students are capable of dealing with. For example the card by itself is suited to Grade 2 students. With extra information from Part One, card 2a can be used to teach a topic on Different plants and animals that live in the environment for Grade 5s.

Work through the cards with the students and help them understand the different features on the black rhino.

CARD 2b

WHITE RHINOS - FACTS

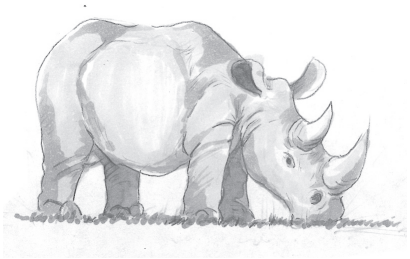
This card can be used as media when teaching the concepts of PLANTS, HABITATS, and POPULATIONS OF WILD ANIMALS as needed by the updated curriculum. This card provides detailed information on the white rhino. Once the students have worked through both sides of the card they can start to compare the two different animals.

Explore the various features that the black and white rhinos share. For example, skin colour, shape, two horns on the front of their face, small populations etc.

Next explore the ways in which the two species are different, for example, the shape of their lips, what they eat, their size and height.

Teachers are encouraged to use Part One of the Guidebook to help teach this lesson. Additional information can be introduced to match the level of detail the students are capable of dealing with. For example the card by itself is suited to Grade 2 students. With extra information from Part One, card 2b can be used to teach a topic on Different plants and animals that live in the environment for Grade 5s.

CARD 2



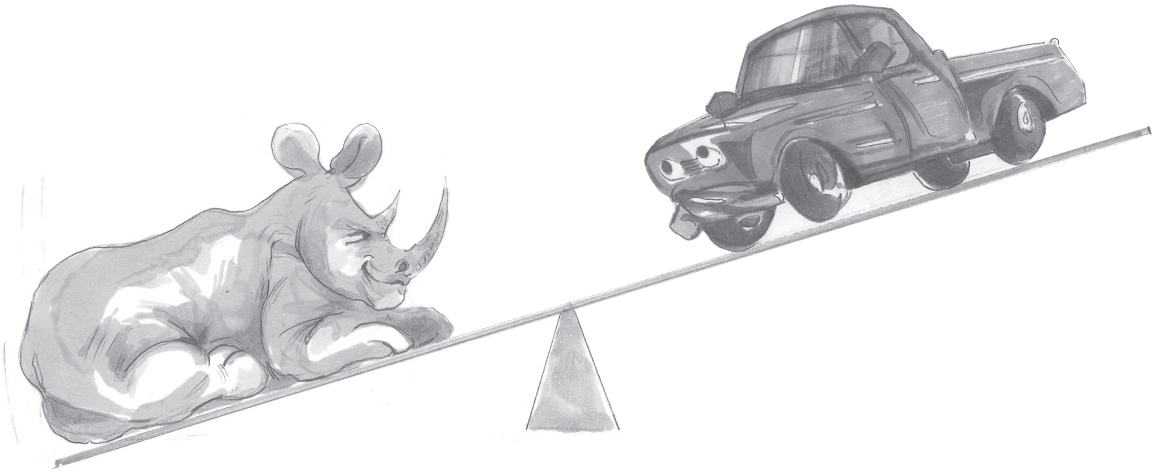
EXERCISE

Once the students are familiar with the various features divide the class into groups, one group are "WHITE RHINOS" the other "BLACK RHINOS". Then, the teacher asks the questions numbered below. The children have to respond by standing up and answering if they think their group fits the question.

Example: The teacher asks,
"If I have a pointed lip, what am I?"

The "BLACK RHINO" group should all stand up and say "A BLACK RHINO.
If a student stands up in response to the wrong description, he/she has to leave the group. The winning group is the one with the most students left at the game.

1. **If I have a pointed lip, what am I?**
(A BLACK RHINO)
2. **If I have a wide lip, what am I?**
(A WHITE RHINO)
3. **If I eat trees and shrubs, what am I?**
(A BLACK RHINO)
4. **If I eat grass, what am I?**
(A WHITE RHINO)
5. **If I have three toes on each foot, what am I?**
(Both BLACK AND WHITE RHINO)
6. **If I am as tall as a boy, what am I?**
(A BLACK RHINO)
7. **If I am taller than a man, what am I?**
(A WHITE RHINO)
8. **If I weigh more than a Land Cruiser, what am I?**
(A WHITE RHINO)
9. **If I like to live in SAVANNAS, what am I?**
(A WHITE RHINO)
10. **If there were only 5,261 of my kind still alive by end if 2015, what am I?**
(A BLACK RHINO)
11. **If I have grey skin, what am I?**
(Both BLACK AND WHITE RHINO)
12. **If my shoulder height is between 140 to 170cm, what am I?**
(Answer BLACK RHINO)
13. **If thousands of my kind have been killed, what am I?**
(Both BLACK AND WHITE RHINO)



14. If I am Critically Endangered, what am I?
(Answer BLACK RHINO)

15. If I eat leaves and branches, what am I?
(Answer BLACK RHINO)

16. If I like grasslands, what am I?
(Answer WHITE RHINO)

17. If I live in bush land, what am I?
(Answer BLACK and WHITE RHINO)

18. If I weigh up to 2,000kg, what am I?
(Answer WHITE RHINO)

19. If once there were lots of me all over Africa, what am I?
(Both BLACK AND WHITE RHINO)

This game can be played with older students by including more detailed information from Part One. More specific questions can then be asked of the students.

This exercise helps encourage the students to learn the features of the two species and reinforces their understanding of the differences between them.

CARD 3a

THE RHINO HORN - POACHING

Read through the card together with the class and discuss the concepts of POACHING and POPULATIONS as needed by the updated curriculum. Poaching is the main reason behind the decline of rhino POPULATIONS. Information from Part One can be discussed to help the students develop a deeper understanding of the problems facing the rhinos. Encourage the students to see that they have a positive role to play in the fight to save the rhinos from extinction. Part One offers various suggestions as to the positive contributions local communities can make to rhino conservation.

Discuss that poachers often try to get information about where to find rhinos from people who live nearby. Help them to understand that the people who live near rhinos are actually the people in the best position to save the rhinos from extinction because they can help stop a rhino poacher before he kills a rhino. Discuss with the students what to do if they find snares in rhino areas. Identify who students should tell if they think there is a rhino poacher in their community, e.g. teachers, scouts, and local community leaders.

CARD 3b

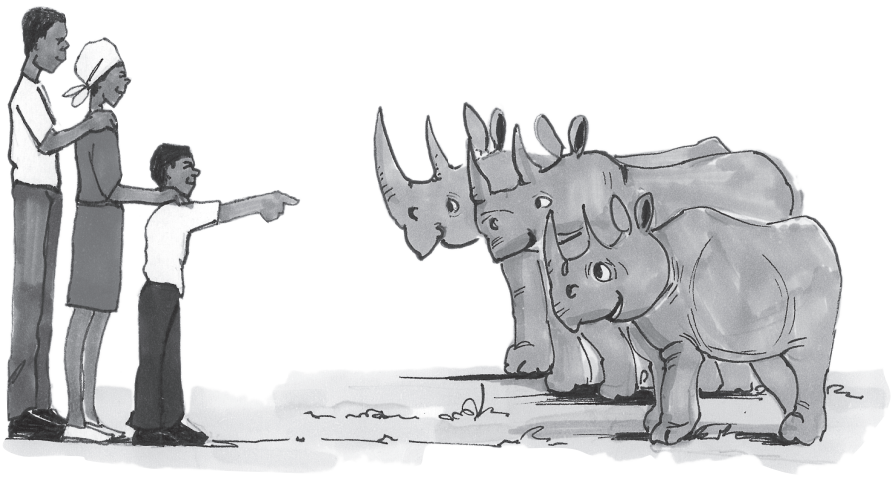
RHINOS REPRODUCTION

This card can be used as media when teaching the concept of ANIMAL REPRODUCTION as required by the updated curriculum. An example, a rhino cow could have up to 4 calves in ten years if she has a calf once every two and a half years.

Ask the students about the reproduction rate of other animals they are familiar with like goats and cattle. Do these animals reproduce more quickly or more slowly than the black rhinoceros? The children can experiment with the concept of reproduction and populations as a simple maths exercise. Each group should start with the same "population", (seeds or stones will do). One group will represent goats. Another group can be cows and another rhinos, etc. Each group will reproduce (be given more seeds or stones) equivalent to the reproduction rate of their animal. Each round represents one year. So in one round the goat group will have two added to their population to represent twins, the cow group will have one added and the rhino group will be given one. In the next round the populations of the goat and cow groups will grow again but the rhino group will not. They will have to wait another two and a half years before the rhino can reproduce again. After a suitable number of rounds the students must count their populations and work out which animals have the biggest populations and why.

This exercise can be made more complex for older students by including deaths (subtractions). Students that are old enough may be asked to consider the fact that the number of females in a population influences population growth. The populations can grow in relation to the number of reproducing females (multiplication).

The final population of black rhinos will always be less than for the other animals. Ask the class why this is so? Discuss the implications of this for black rhino populations. Because the rhinos reproduce very slowly it takes a long time to replace animals that are killed. This is one of the reasons why it is very important to protect black rhinos from being killed.



CARD 4a

LAND FOR WILDLIFE - USES

This card can be used as media when teaching the concept of WILD ANIMALS IN THE ENVIRONMENT required by the updated curriculum. Read through and discuss the content of the card with the students.

Ask them to name the conservancy closest to their area, the National Parks or other wildlife areas that they know. Ask them what different animals they think live in those areas? Highlight the role wildlife areas play in conservation. Discuss Intensive Protection Zones in National Parks and Conservancies and the important role they play in saving the rhinos from extinction.

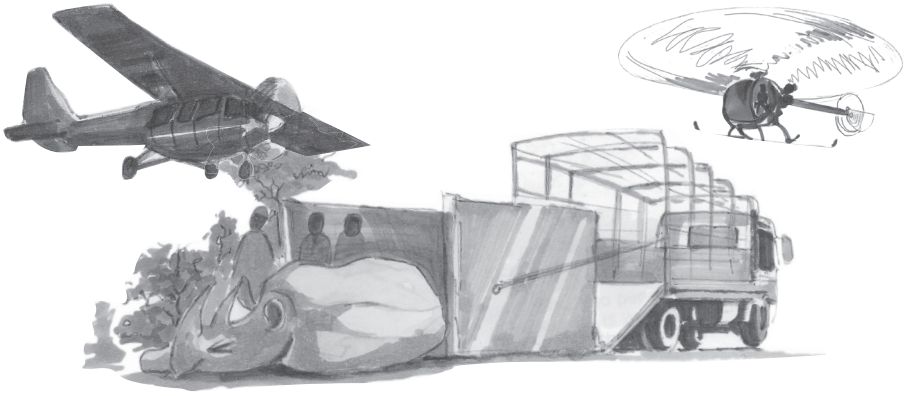
Older students should be encouraged to think about the various reasons for maintaining land for wildlife and the benefits these areas provide. Discuss with the students the value of wildlife areas for the environment and the economy. Many tourists visit Africa to see wild animals in these special areas. Tourists pay to be able to visit these wildlife areas in much needed foreign currency. Tourism is one of the largest industries in the world and provides many different jobs.

CARD 4b

RHINO PROTECTION

This card can be used as media when teaching the concept of WILD ANIMALS IN THE ENVIRONMENT required by the updated curriculum. Read through and discuss with the students the various strategies which are used to improve protection of rhinos.

Ask the students the strategies which they use at their homesteads for the protection of their goats, cattle, chicken, sheep. Ask the students the strategies they use at their homesteads to protect their crop fields from wild animals and livestock.



CARD 5a

HABITAT

This card can be used as media when teaching the concepts of HABITATS, DEFORESTATION, CLIMATE CHANGE and SOIL EROSION as required by the updated curriculum.

Once the students have read through the card ask them to explain what a habitat is in their own words. Help them to understand that animals, like humans, need certain things to survive. Ask questions to see if the students understand.

What is a rhino's equivalent to a borehole? (Water hole)
What is the human equivalent of thick bush and trees? (Crops and houses).

Part One provides more detailed information about rhino habitat.

The students should understand that a habitat has many different parts and the destruction of any one of those parts effectively destroys the habitat. They should also be aware that it is not always possible to re-establish a habitat once it has been destroyed. Help the students to see the link between habitat destruction and the survival of wild animals.

It may be useful to use this card in conjunction with Card 1 so that the students can explore the fact that there are different habitats and that different animals live in them.

For example: Crocodiles live in river habitat.
Black rhinos live in bush habitat.

The students should explore the different habitats around the school. Help them identify river habitat, kopje habitat and bush habitat and the different animals you would expect to find in each.
.

CARD 5b

TERRITORIES

This card can be used as media when teaching the concepts of TERRITORIES and HOME RANGES as required by the updated curriculum.

Read through the card with the class and help the students understand the concept.

Rhinos are not the only animals that have territories. Most wild animals live within territories. Draw a map on the board to show an area with a river, kopjes, thick bush and open areas. Outline the territories of some animals that live in that area. Put a klipspringer territory around the kopje, a rhino territory around the thick bush and down to the river. A leopard's territory can overlap the kopje, thick bush and river. A duiker territory could be near the river.

Ask the students about the different territories the animals keep.
Which animals have overlapping territories?
Which animals have water within their territories?
Why are some territories large and others small?

It is useful to be aware of the territories of different animals within your environment. For example, if you know that a certain kopje is inside a leopard's territory it would be best not to leave your goats there overnight to avoid them being eaten. If you see dung piles and scrapes it is likely that the area you are in is part of a black rhino's territory. It is very likely that the rhino will be somewhere in the area. To avoid getting too close to the rhino, which may charge if it gets a fright, try to avoid walking through the thick bush, where the rhino often rests during the day.

Older students could be asked to draw their own maps. They could choose a piece of land near the school to base it on and map the territories of wild animals they think could live in the area.

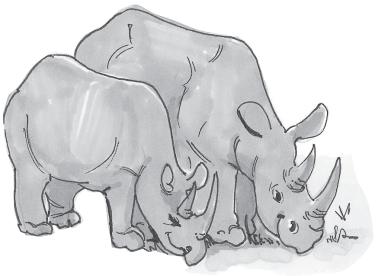
CARD 6a

RHINO POEM

This card can be used as media when teaching the concept of ENGLISH READING ABILITY AND UNDERSTANDING as required by the updated curriculum.

Younger classes may need to have the poem read to them as an English exercise. Older students can read the poem and answer the questions themselves.

Ask the students to make up their own poem about rhinos or another wild animal that they are familiar with.



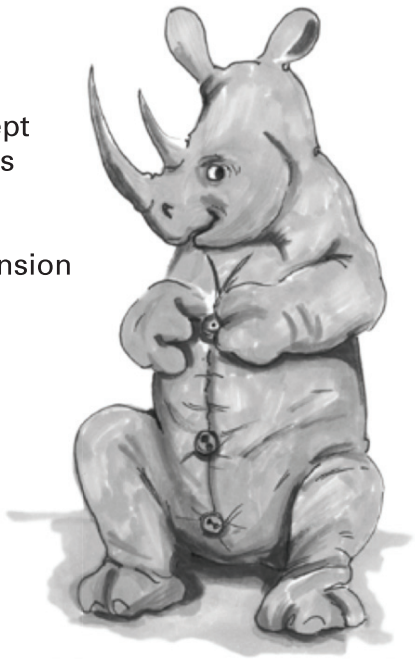
CARD 6b

RHINO STORY

This card can be used as media when teaching the concept of ENGLISH READING ABILITY AND UNDERSTANDING as required by the updated curriculum.

This card is intended to be used as an English comprehension exercise. The story may be read to the class or allow the students to read through it on their own.

Some possible questions:
What size was the cake?
What is on the rhino's nose?
How many ears does a rhino have?
Which sea did the rhino swim in?



CARD 7a

ADDITION AND SUBTRACTION

This card can be used as media when teaching the concepts of ADDITION and SUBTRACTION arithmetic operators as required by the updated curriculum.

Answers for addition and subtraction questions

1. **Most – 2015 and Least - 2001**
2. **Most – 2012 and Least – 2003**
3.

Country	Highest	Lowest	Difference
Botswana	48	0	48
Kenya	679	430	249
Mozambique	2	0	2
Namibia	1957	893	1064
South Africa	1915	1179	736
Swaziland	20	10	10
Zambia	32	0	32
Zimbabwe	558	424	134

4.

Country	Highest	Lowest	Difference
Botswana	239	39	200
Kenya	444	170	274
Mozambique	29	0	29
Namibia	826	170	656
South Africa	19112	10536	8576
Swaziland	89	50	39
Zambia	10	1	9
Zimbabwe	341	218	123

5. **20584 – 11670 = 8914**
6. **5261 – 3100 = 2161**
7. **558 – 424 = 134**
8. **341 – 284 = 57**

9.

Country	Number
Botswana	7
Kenya	594
Mozambique	1
Namibia	1750
South Africa	1915
Swaziland	17
Zambia	27
Zimbabwe	431
Total	**4742**

10.

Country	Number
Botswana	99
Kenya	234
Mozambique	0
Namibia	293
South Africa	13521
Swaziland	75
Zambia	2
Zimbabwe	308
Total	**14532**

11. 341 – 290 = 51

12. 558 – 431 = 127

CARD 7b

MULTIPLICATION AND DIVISION

This card can be used as media when teaching the concepts of MULTIPLICATION and DIVISION arithmetic operators as required by the updated curriculum.

Answers for multiplication and division questions

1. 50cm / 5cm per year = 10 years
2. 40 years
3. 20 years / 2.5 years for each calf = 8 Calves
4. 1.4kg X 14 days = 19.60k + 40kg = 59.60kg
5. 23kg X 3.5 days = 80.50kg
6. 150cm / 10 seconds = 15cm/s
7. 465 days / 7 days = 66.4 weeks
8. (Accept all answers)
9. 55 km/hr. – 35 km/hr. = 20km/hr.
10. 136cm / 5cm per year = 27.20 years

CARD 8a

BODY/BEHAVIOUR FEATURES

This teacher can use this card in a lesson of COMPARING and CONTRASTING features which is within the updated curriculum.

CARD 8b

GLOSSARY

The students can use this card to find meanings of new words in the Environmental Science subject which are relevant to the updated curriculum.

NOTES

NOTES

NOTES