



Footprints

Nature Quest



By Shirley Erwee & Wendy Young



ACKNOWLEDGEMENTS

Footprints Nature Quest

is dedicated to the home educating families of South Africa who want to take a scenic route in their homeschooling journey.

We create because it brings us joy, and working on this project with our daughters – Sarah and Kayleigh - has been a delight.

We acknowledge too, all the authors who have given us such a rich literary heritage to discover in **Footprints Nature Quest**.

And mostly our Heavenly Father and Creator who has given us all these wonders to behold.

We thank the librarians who have helped us uncover long forgotten books and bring them back to life.

We also deeply thank two homeschool moms, Nadene and Jenny, who took the time to read our drafts and give their valuable input in the guide to make it even more homeschool mom friendly!



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Plan your week but be flexible

Time in nature is an integral part of a Charlotte Mason-style education. We recommend that you read a portion of the stories included in this programme aloud together daily, on four days of the week. They are brimming with information about each area of the country you will study. Read them at your own pace.



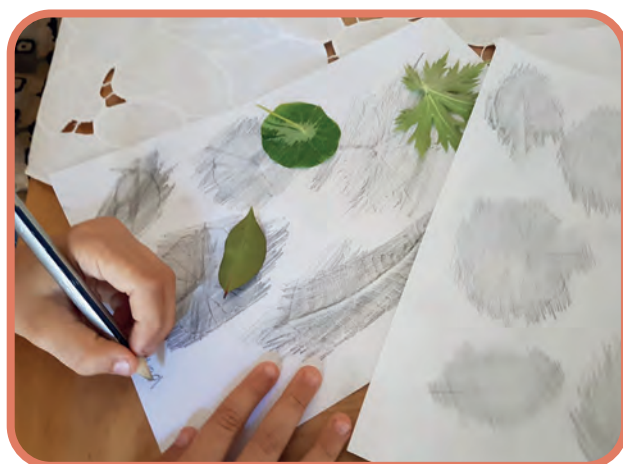
At the same time, read a section of the information in this guide each day that further explains the richness of each biome. The stories help to captivate your children and get them engaged in the topic of study. The guide provides the background information to give it more context. Adapt the amount of information you read aloud or summarise it to suit younger children if necessary.

On the fifth day of the week, we recommend that you schedule nature study, field trip outings and other practical learning activities.

When and how to do nature study

It doesn't matter if you have never purposefully done nature study before. Simply go outside together at least once a week, with the intention of observing.

As with all new things that you introduce into your home life, add nature study in baby steps. Start with small goals and gradually extend your expectations as your children become more trained in this discipline.




Children thrive by spending many hours out of doors and during this time much learning and development occurs. However, nature study is a time for focused attention, usually directed towards something specific by the parent. The goal is to cultivate a love of investigation.

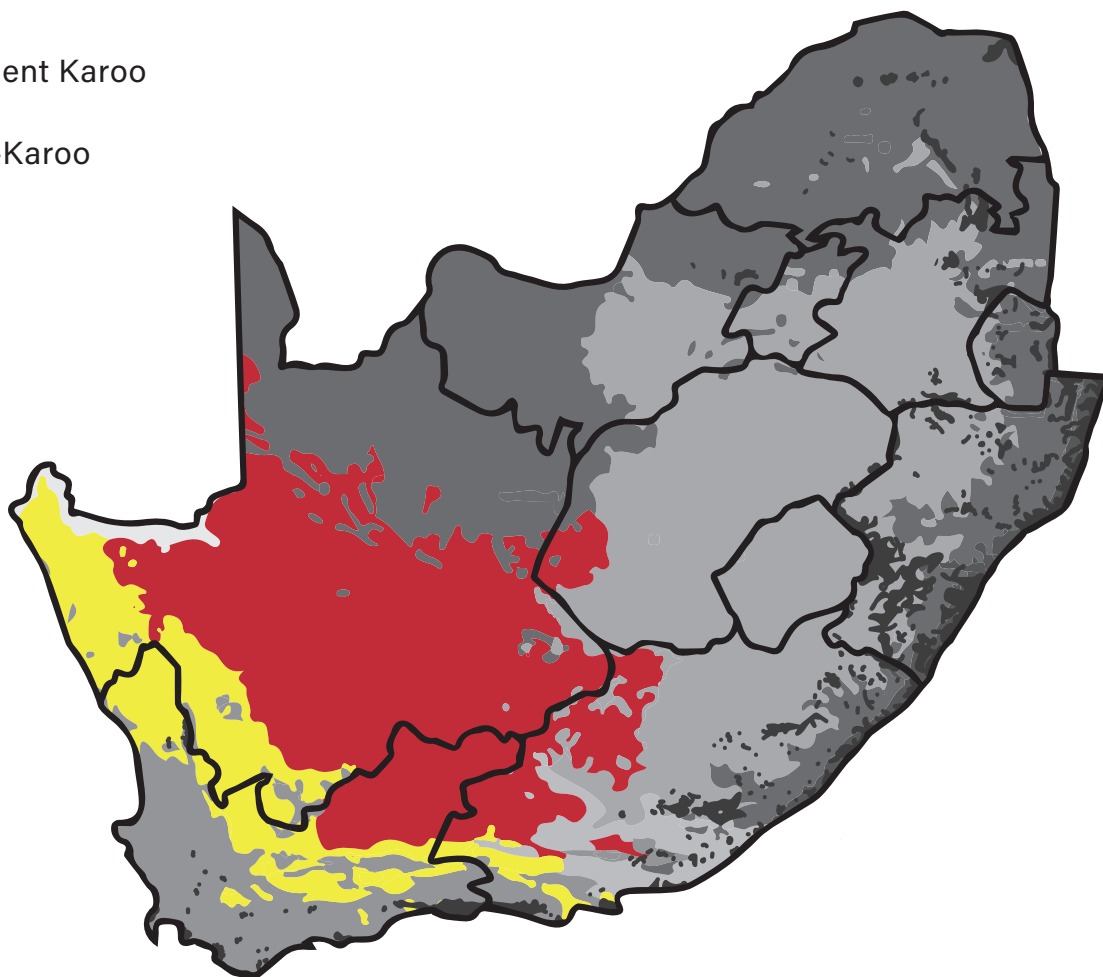
"Let them once get in touch with nature and a habit is formed which will be a source of delight and habit through life..." wrote Charlotte Mason.

This focused time should be scheduled into your week. It could be 20-45 minutes including, or followed by, an entry in your nature journals. Adjust this time if you have smaller children with shorter attention spans.

Section 2: Nama-Karoo and Succulent Karoo

 Succulent Karoo

 Nama-Karoo



Guide

Piet Alleman will meet us near Nieu Bethesda, which is 50 kilometres from Graaff-Reinet and tell us more about life in the Nama Karoo biome. Then we will continue our journey westwards into the succulent Karoo biome bypassing a number of Karoo towns, until we reach Vredendal, where we'll turn northwards towards Springbok to view the magnificent show of Namaqualand daisies, on our way to Alexander Bay. We will learn about the richness of these unique biomes as well as some of the threats to the environment in various regions.



Section 2: Nama-Karoo and Succulent Karoo

Topics

- Nama Karoo
- Great Karoo and Little Karoo
- Sheep
- Karoo Biodiversity
- What is a Rain Shadow?
- Succulent Karoo
- Succulent Poaching
- What are Alluvial Diamonds?
- What is a Wetland?
- Khoikhoi and Khoisan People
- The Shepherd's Tree
- Karoo Koppies
- Water in the Karoo
- The Fracking Threat
- Namaqualand
- Alluvial Diamond Mining on the West Coast
- Alexander Bay

Checklist

Picture books

- ☐ Grandma's Hat
- ☐ The Little Meerkat Who Saw the Sun
- ☐ The Karoo Hen
- ☐ Zebra's Stripes and Other African Tales (ebook, not supplied)

Chapter books

- ☐ Stories my Gogo Told Me
- ☐ Journey to the Copper Mountains

Reference books

- ☐ Abygale Aardvark and her Animal Friends
- ☐ Inventors, Bright Minds and other Science Heroes of South Africa

Additional books

- ☐ Nama Kwa's Garden
- ☐ The New Fire

Section 2: Nama-Karoo and Succulent Karoo

Movies

- ☐ Africa's Hidden Kingdoms OR Namaqualand - Africa's Desert Garden
- ☐ Ours, not Mine!
- ☐ The Gods Must Be Crazy



Remember to refer to your atlas about the area you are studying in this section.



Picture books

Grandma's Hat, Rosemary Khan

Step into a bygone era in the Karoo as grandma tells the story of a hat she owned as a child. The story is based on the author's own life and the illustrations were inspired by her photographs.

The Karoo Hen, Jenny Seed

The Karoo Hen is an individual who does not want to be like the other hens in the yard. She is always doing something different in order to make herself feel important. One day she wanders onto an empty railroad car and ends up in Johannesburg...

The Little Meerkat Who Saw the Sun, Claudia Rudolph

These beautiful pocket sized story books are written and illustrated by a father and daughter team who are Karoo dwellers. The whimsical artwork brings the stories to life. Included in each book is a little one page pull out activity. Owl-eye, the little meerkat, embarks on a journey to seek the answer to a question no one else seems to be asking about the rings around her eyes.

Section 2: Nama-Karoo and Succulent Karoo

Chapter books

Stories my Gogo Told Me, Lisa Grainger

On a little wooden stool, under the stars, the children beg their grandma to tell stories of when she was a girl, of how it was in the olden days, when man was a hunter-gatherer and when animals roamed Africa freely.

Journey to the Copper Mountains, Joan Salveson

Feeling disillusioned by his mother's remarriage, Jan joins Simon van der Stel's expedition in 1685 to search for copper in Namaqualand. This fascinating story, based on truth, depicts not only the adventurous journey through an unknown, inhospitable country, but the maturation of a teen facing the same feelings that many young people struggle with today.

Reference books

Abygale Aardvark and her Animal Friends, Lynn Hurry

This carefully researched and beautifully presented book for readers of all ages dedicated to the urgent need to protect and enrich the wonderful wildlife of Africa. While each of the twenty stories is introduced and commented on by fictional character Abygale Aardvark, she leaves the actual story-telling to the real wildlife characters themselves.

Inventors, Bright Minds and other Science Heroes of South Africa

Read the following short biographies during this section:

1. Success thanks to diamond smuggling
2. Making a plan with mining waste

Additional books

Zebra's Stripes and Other African Tales, Dianne Stewart (ebook)

Dianne Stewart has retold a collection of folk tales that have their origins all over Africa: from people such as the San and the Zulu and places like Zambia, Congo and West Africa. Each section is devoted to a type of animal, and concludes with some facts about the animal in question, adding educational value to the stories. Since this book is available in ebook format only, it is not supplied, but recommended.

Section 2: Nama-Karoo and Succulent Karoo

Nama Kwa's Garden, Mary Clanahan

In this picture book folktale, Chief Nama Kwa thinks that the Great Spirit must have been angry when he created the land, to leave it with such a dry 'scar'. His people plan a birthday surprise for him that results in the desert blooming with colour.

The New Fire, Jenny Seed

Set in the time of ever increasing encroachment on the Khoisan territory, this chapter book story tells of the plight of a young San boy, whose parents are killed and his little sister abducted by white settlers. He realises that he must move away and make a new fire, but he also sets out to rescue his sister. An exciting yet thought provoking piece of storytelling.

Movies

Africa's Hidden Kingdoms (The Desert Bloom) - This documentary focuses on the desert bloom that occurs annually after a punishing 10-month dry period. It also focuses on the indigenous creatures that live in Namaqualand such as the speckled padloper, mole snake, and other species that survive the harsh conditions.

Namaqualand, Africa's Desert Garden - This documentary on The Secrets of Nature YouTube channel displays the rich biodiversity of this amazing living kingdom.

Ours, not Mine - This short film sheds light on the destructive mining practices on the west coast of South Africa and its impact on local communities and the environment.

The Gods Must Be Crazy - When a Coke bottle falls from the sky, a San tribe are faced with an object that disrupts their peaceful existence. Xi decides to return the object to the gods whom he believes are its rightful owner. Humour deriving largely from cultural differences provides an entertaining story, but will also give you interesting perspectives to debate and discuss.

Section 2: Nama-Karoo and Succulent Karoo

Field Trips

Visit any of the small Karoo towns but our favourite places are:

- Karoo National Park
- Train to the magical Matjiesfontein
- Sutherland – visit SALT while there
- Graaff Reinet & Camdeboo National Park
- Nieuwooudtville's quiver tree forest
- Namaqualand daisies up the west coast
- Route 62 - variety of villages and farms
- Montagu
- Oudtshoorn
- Cango Caves
- Ostrich farms



The Cango Caves, Oudtshoorn

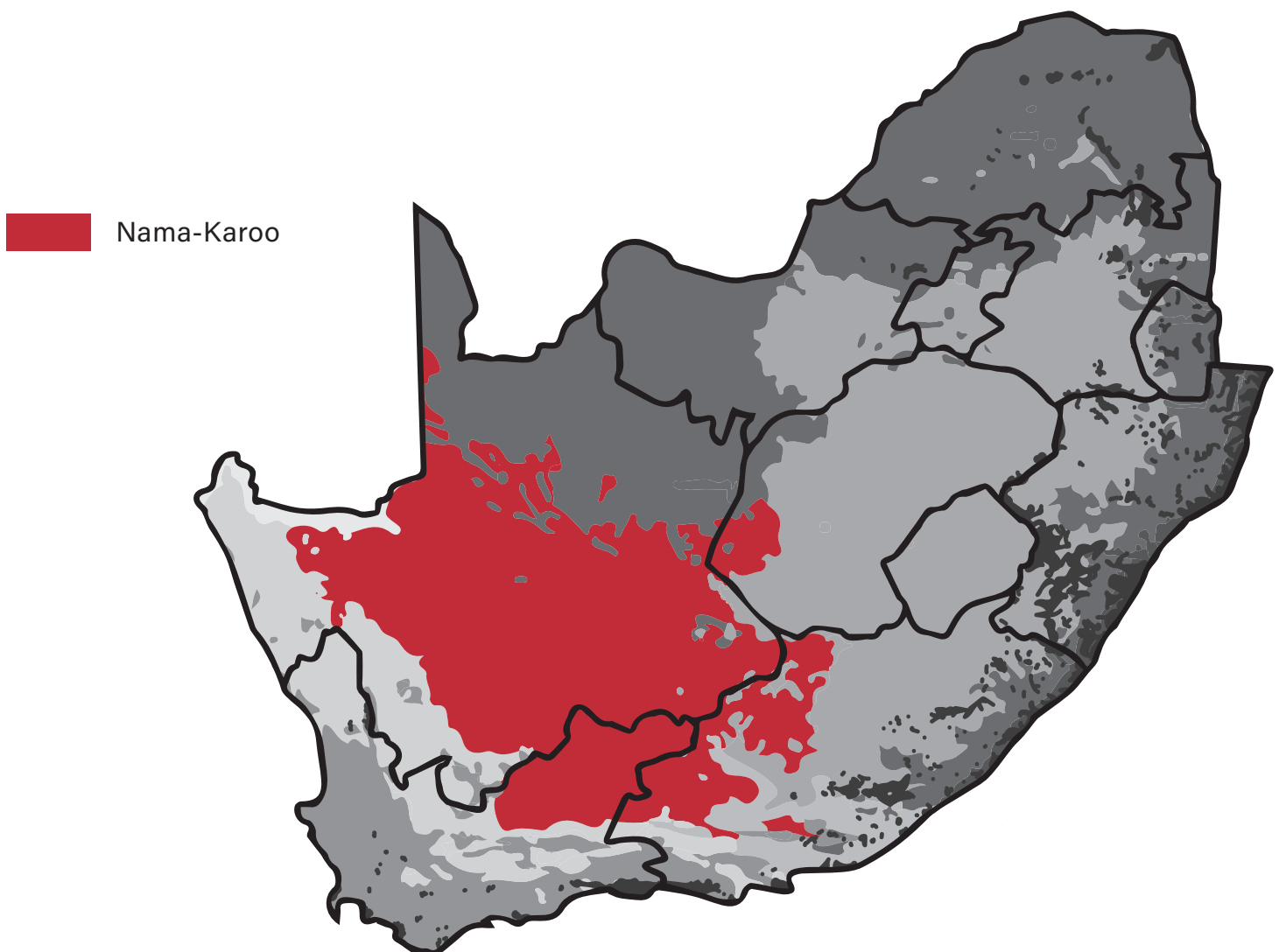
Section 2: Nama-Karoo and Succulent Karoo

Nama-Karoo

South Africa is one of the most biodiverse countries in the world. Do you remember what *biodiverse* means? Tell your family what you remember.

In case you forgot, it means that we have a wide variety of living things - plants, animals, fungi and even teeny-tiny, microscopic bacteria that live in our country. Let's begin our adventure as we tour through our country and learn about some of the natural wonders that it holds.

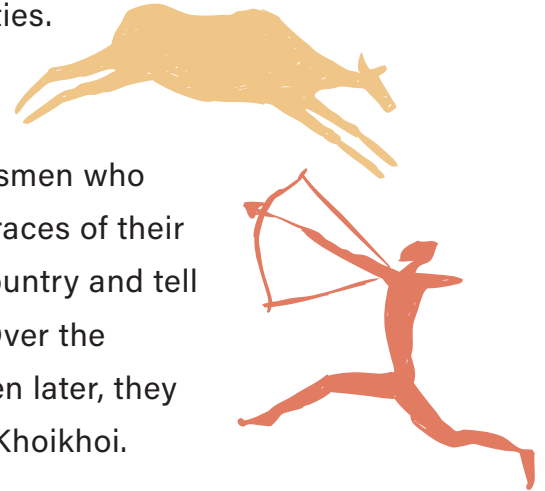
We are going to start our nature quest in the Nama Karoo. This biome covers 20% of the total size of South Africa, but isn't the largest. The Nama Karoo biome is a semi-desert with a low annual rainfall between 200-500mm. It is home to a large variety of animal life and vegetation in the form of dwarf shrubland grows here.



Khoikhoi and Khoisan People

It is here that some of the first inhabitants of our country, the Khoikhoi and the Khoisan (also referred to as Khoi and San) people still live. They originally lived throughout Southern Africa and roamed as nomadic hunter-gatherers in small communities.

These communities would follow the wild herds, which were their food sources, but later the Khoikhoi became herdsmen who kept their own animals. As they travelled, they would leave traces of their lives behind. San cave paintings are scattered all over our country and tell stories of their beliefs, hunts and about their communities. Over the years these wandering people were called Bushmen, and then later, they were correctly referred to by their true names: Khoisan and Khoikhoi.



These Khoisan tribes were pushed further and further south by the Nguni tribes, who were people groups living in central and western Africa, so that by the time the Portuguese explorers travelled around the Cape of Good Hope in 1488, it was the Khoikhoi who greeted them. When Jan Van Riebeeck and the first Dutch settlers arrived at the Cape in 1652, it was the Khoikhoi with whom they clashed over land ownership.

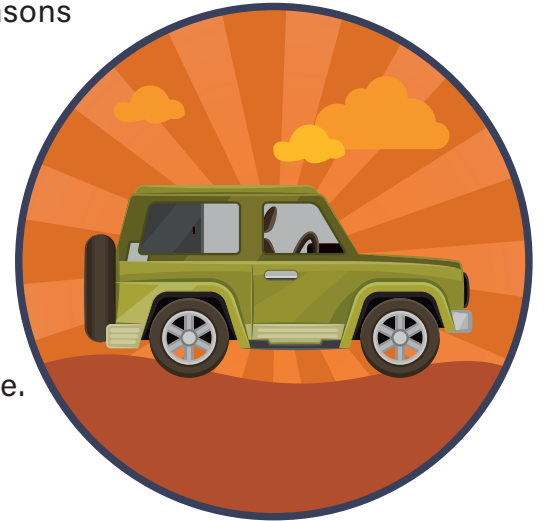
To meet us on this first part of our trip is a young Khoikhoi man, who will be our guide as we travel through this “place of great dryness” and learn about the wonders of the Nama Karoo. He is meeting us in the little town of Nieu Bethesda, which is renowned for its artists, angora goats and Karoo lamb.



Nieu Bethesda is at the foot of the Sneeuberg mountains along the banks of the Sundays River. The village is situated in the Eastern Cape and is approximately 50 kilometres from Graaff-Reinet. The town is part of the Great Karoo, and here, at the old suspension bridge outside the town, Piet Alleman, our guide waits for us in his old Land Rover.

Piet's family has lived in the Karoo for many generations and he can proudly trace his heritage back to the first family tribes who settled in this area. During our trip with him, we will stop at a few spots of interest in the Karoo and discover some of the reasons why, people who have been born and lived here, never truly leave it, even though the Karoo is a stark and dry place.

Piet explains that the Karoo region of South Africa covers a large portion of South Africa's landmass and falls over four of South Africa's provinces. You will find the Karoo touching the Western Cape, Eastern Cape, Northern Cape and the Free State. This area gets its name from the Khoikoi word "Land of Thirst".



Great Karoo and Little Karoo

There are two parts to the Nama Karoo - the Little Karoo and Great Karoo. Piet fetches a map he keeps in his Landie to show us that, as we leave the southern part of the African coastline, we climb over the Cape fold mountains on the south and south-west of our land and enter the world of the Karoo. The Great Karoo stretches up into the north, north-west and eastern areas and then fades into the grassy savanna of the highveld areas of Southern Africa. You will learn more about the savanna biome in a later chapter.

The Little Karoo is a long narrow valley which is bordered by the Swartberg in the north and Langeberg Mountains in the south. It begins in the town of Montagu in the west and ends in Oudtshoorn in the east. We could drive the length of the Little Karoo in less than a day and as it is only 60km at its widest point. You can understand why it's called the Little Karoo! However, we won't be doing that drive - there is too much to see and we have a long journey ahead.



"Little" in Little Karoo does not mean less. It has some of the most scenic drives, beautiful towns, food festivals and is a hubbub of a place for sheep farmers with an estimate of seven million sheep being farmed there at any time.

As we drive along in the Landie, the sheep are not hard to spot. Now that they have eaten the scrub from the farmers' land in the morning, they are all standing head down in the shade of a shepherd's tree.

Piet pulls over to allow a donkey cart to pass and the local farm labourers smile and wave. He tells us that this is indeed the common name of the shepherd's tree. You can practise the Latin name if you like – it rolls off your tongue quite nicely: *Boscia Albitrunca*. It is often called the "Tree of Life" as it offers sustenance to both humans and animals.



The Shepherd Tree

The shepherd tree's roots are pounded to make porridge and they are commonly used as a substitute for coffee or chicory. The root can also be used to make a beer. The leaves are nutritious and are often eaten by cattle, although the milk is then said to be strongly flavoured and unpleasant. An infusion of the trees' leaves is used to treat eye infections in cattle. The fruits are used in traditional dishes and the flower buds are used as caper substitutes in pickles. Local craftsmen and women use its wood to make household utensils.

Sheep and many other animals use this tree for shade during the heat of the day.



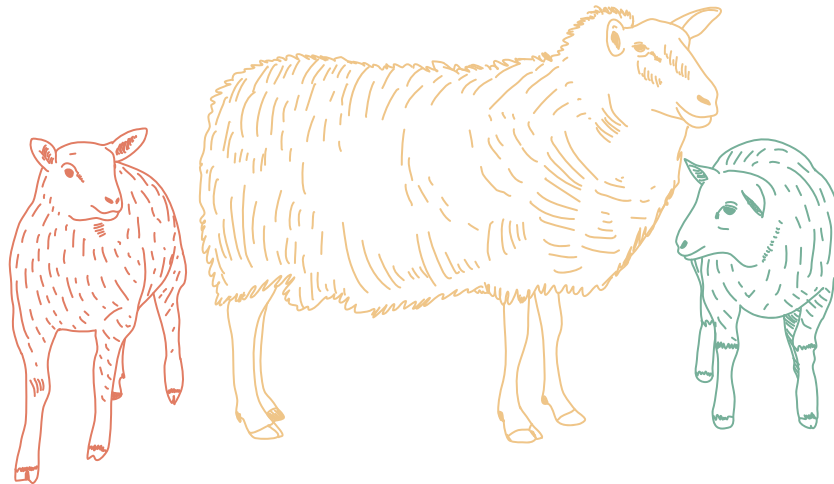
Sheep

The sheep in the Karoo are farmed for meat and for their wool. Around the country Karoo lamb is a highly sought-after meat for many dinner tables. Have you ever heard of the meat called mutton? Piet explains the difference between *lamb*, *sheep* and *mutton*.

The word *sheep* refers to sheep of all ages. It applies to new baby lambs as well as older breeding stock. The word *sheep* also applies to male as well as female animals, and to both meat and wool producing sheep breeds.

Lamb is a term for sheep that are under one year old. Farmers can see how old a lamb is by looking at how many teeth it has in its mouth. When sheep are sold, their age really matters. Animals under 12 months will be sold differently and attract higher prices than animals that are over 12 months of age.

Where this all gets a bit confusing is that lamb is also the word used to describe the meat of a sheep less than one year old. *Mutton* is the term for sheep meat that is from animals that are older. Perhaps when you finish reading this section, you will learn how to make a traditional mutton stew? Yum!



Karoo Koppies

As we pull out onto the road again, Piet points out some Karoo koppies that stick out from the generally flat landscape.



These Karoo koppies are hills which have a hard cap of dolerite on the top. For many years geologists have pondered how the very hard rock layer remains as a “lid” on the top of the mountains. Those that believe in evolution will tell you that the hard dolerite lid is left behind after years of erosion had taken place on the softer hillside. What else do you think, besides millions of years of erosion, could have left a unique landscape like this? Do you think that if the world had been covered completely to the highest mountain top with water for a few months, it would look the same after all that water had retreated?

Remember you don't have to have all the answers now, but you do have to have an enquiring mind. When we study rivers and mountains in a later chapter, you will learn much more about this question.

Nama-Karoo Biodiversity

Piet continues to tell us about the amazing biodiversity of the Nama Karoo, where we could find 6 000 different plant species, 58 different mammals of which at least 10 are large herbivores, 5 species of tortoise, 18 types of snakes and a variety of other reptiles. These animals are all created to survive in the harsh dry conditions. Some, like the rare riverine rabbit and black rhino, are endangered. Yet, while the conditions are harsh, this vast array of animals still continue to live, raise young and exist in a chain of life with other animals and plants around them.

As we peer out the vehicle's window, it's clear that we are not looking at lush green vegetation. The plants that we see now are collectively called "Karoo scrub". This scrub, also called *renosterveld* and *karooveld*, consists of low-lying sparse bunches of vegetation which are food for the sheep being farmed in the area and also for the indigenous herbivores.

Water in the Karoo

The Karoo is a summer rainfall area, where the annual rain, which falls in summer, between December and February, is in the form of thunderstorms. The winters here are very dry and cold - some nights the temperatures fall to freezing point, while the days are warm. The Karoo exists in a rain shadow caused by the mountains in the south and western part of South Africa.

What is a Rain Shadow?

A rain shadow is an area that has little precipitation because some barrier causes the winds to lose their moisture before reaching it. In this case, as warm moist air from the coast comes into contact with a mountain range, it is forced upwards and as the air cools, the water vapour it contains condenses into droplets which fall as rain before it reaches the other side of the mountain.

The *rain shadow* is on the dry side of the mountain range.

Even while there is very low rainfall in the Karoo, with an average annual rainfall of 200mm, several rivers are still found throughout the region. However, in times of drought, many of the riverbeds lie parched and dry, in remembrance of when they were gushing with water.

But as the drought breaks and summer thunderstorms fill the basin with life-giving rain, those same dry riverbeds are ready to welcome the torrential water. In some places in the Karoo, during the years 2011 to 2020, they received only around 13mm of rain per annum, so as the heavier rains in January 2020 started to fall, they brought much relief to the farmers, animals and plants of the area.

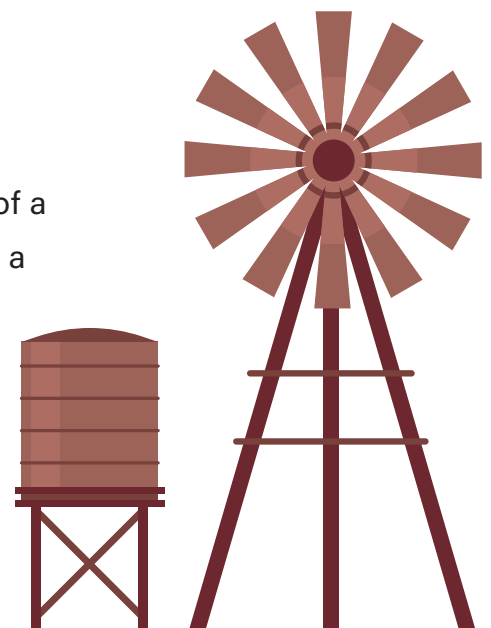
As we continue our guided drive, you will probably see a windmill every couple of kilometres or so. While the Karoo is a dry and thirsty land, farmers generally have windmills to pump water up from deep underground water sources.

The Fracking Threat

Piet, like most other inhabitants of the Karoo, was recently part of a legal battle to protect their groundwater from being poisoned by a proposed gas extraction project. He uses a big term to explain it: Shale Gas Extraction. This is commonly called fracking and many environmentalists, farmers and dwellers raised serious concerns about this practice in the Karoo and how it would contaminate the water and ruin the rugged beauty of this biome.

Piet was part of the *Treasure Karoo Action Group* and he tells us that the court ruling was a victory for the environment, as well as the people living in the area. He says that it's not that the locals are against progress, but they are not willing to do it at the expense of the environment and people's health. **If you want to investigate this very important topic, please check the course website for a link on fracking in the Karoo.**

Piet shows us that some farmers have allowed large solar farms to be built on their land. (We are going to look at this in detail in a later chapter). Some ostrich farmers, realising that intensive ostrich farming was destroying the veld, have started to diversify. This means that they have learnt that keeping the correct type of livestock, controlling their livestock numbers and using good veld management are effective methods for protecting the natural Karoo vegetation and for promoting the recovery of the environment where it has been damaged.



Because this area is so sparsely populated and has so little cloud cover, many of the Karoo dwellers are great sky watchers and embrace the possibility that their land may be used for a future space travel departure site! But for now, life ticks over slowly for the people in the Karoo.

This slow life has attracted many people from main city centres to come and settle here. Art has seen a boom as well as handcrafted food creation. The diversity of handmade food on offer, from bread, cheeses, preserves through to meats, olives and fruit means that we can have a brief food safari. As we pull back into Nieu Bethesda, we say goodbye and thank you to Piet for the drive through the stark but beautiful Karoo, and he points us to the best artisan stores.

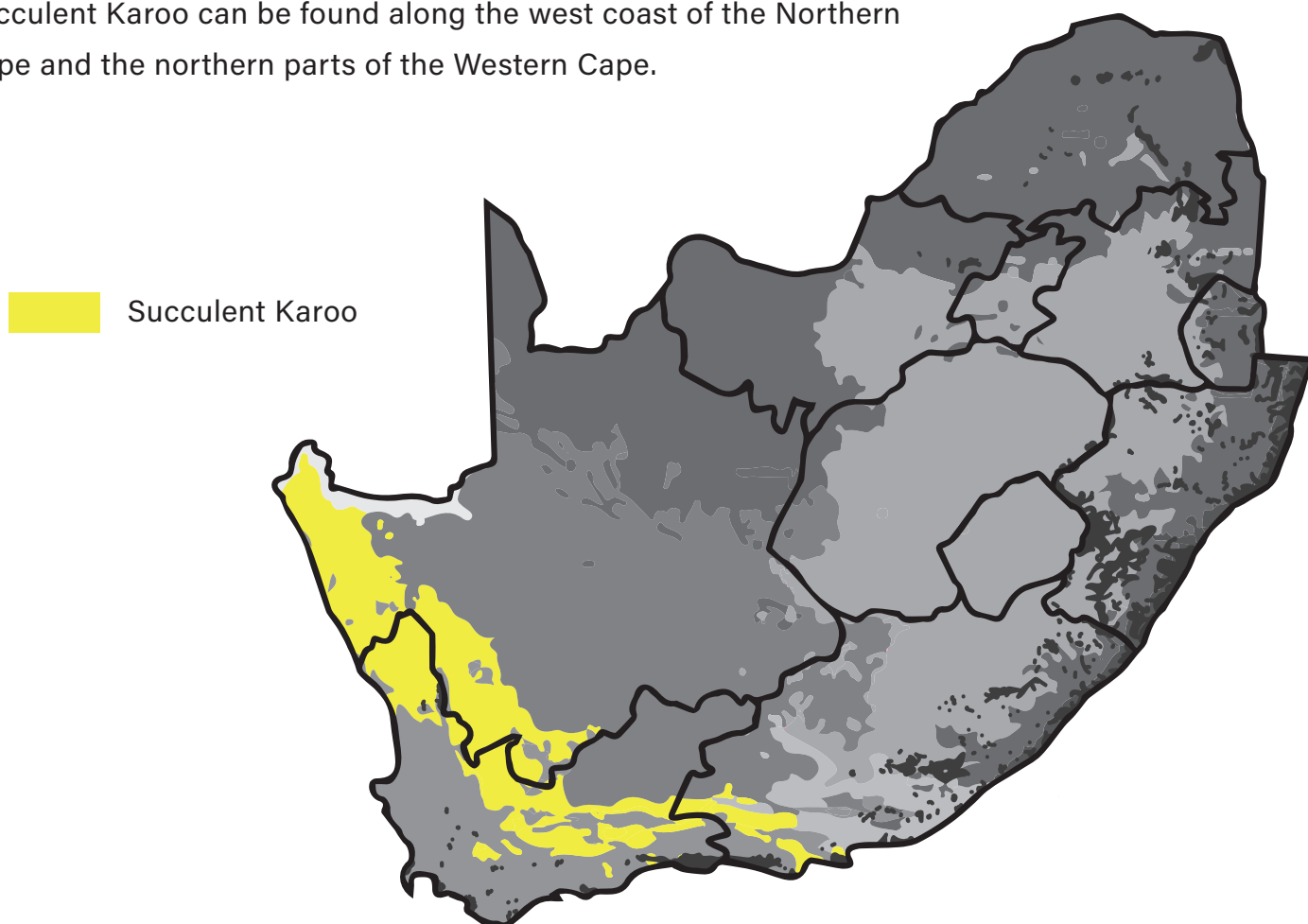
We are going to buy some fresh artisan bread, handmade cheese and dried fruit before we head off to the north west corner of the succulent Karoo, along with lots of other tourists, who are there to see one of the most treasured annual occurrences in South Africa. **Can you guess, from this list, what it is?**

1) *Whale sightings* 2) *Diamond spill* 3) *Bird migration* 4) *Sardine run* 5) *Flowers*

If you guessed flowers - you were right.

Succulent Karoo

Succulent Karoo can be found along the west coast of the Northern Cape and the northern parts of the Western Cape.



The area stretches from Lüderitz in Namibia in the north, through the Richtersveld, Namaqualand, Hantam, Tanqua, Roggeveld and eastwards into the Little Karoo. At approximately 111 000km in size, the succulent Karoo is the fourth largest biome in southern Africa, smaller only than the savanna, Nama Karoo and grassland biomes. It is bordered by the fynbos biome to the south and west, Albany thicket in the east, Nama Karoo to the north and east and the desert biome to the north.

As the name suggests, here you will find mainly semi-desert shrubs with large amounts of succulents. Succulents are plants that store water in their fleshy stems and leaves. The number of plant species is very high and unmatched elsewhere in the world for an arid area of this size. The area is also rich in small animals which are endemic to this region, especially small mammals and reptiles, with larger animals ranging from small antelope and some predators. Do you remember what endemic means?

You got it - it means that a species is naturally found in a specific place only - nowhere else.

Namaqualand

Are you ready to go on a treasure hunt? Let's go on a family exploration of Namaqualand. Namaqualand is part of the succulent Karoo.



Namaqualand is a Khoikhoi name meaning "Nama Khoi people's land." It lies north-west of the Karoo and northward into Namibia. There is very little rainfall in the region, with between 100-500mm rainfall per year. This is due to the impact of the cold Benguela Current which flows up the western coast, causing the region to be very dry. (We will cover this and oceans and currents in more detail in another chapter.)

Namaqualand is world famous for its annual wildflower displays, which bloom in a carpet of dazzling colour each spring. But there's much more to Namaqualand than just daisies. So, let's explore the unique landscapes and captivating biodiversity of what's been called "the richest desert in the world".

Because these daisies follow the sun's movement through the sky, experienced flower viewers advise that we should drive as far north as we can and view them slowly on our return trip. As we travel through Namaqualand, we will encounter many tourists from all over the world, marveling at the magnificent blooms of the daisies, some of the most abundant succulents in the world, the interesting wildlife and the harsh beauty of the dry Atlantic Coast.

There is an astounding variety of plant species in Namaqualand - almost 4 000 - just waiting every year for the winter rains which fall in August and September each year.

When the flowers aren't in bloom, the landscape is dominated by grassy, dwarf shrubland. Most of the growth happens after rainfall, it is then grazed down by animals.

Sadly, large herds of springbok and other game that once roamed across the veld no longer exist. The animals that historically occurred in the area but which are now extinct in this region, include elephant, black rhino, lion, cheetah, wild dog, eland, red hartebeest, gemsbok, springbok and Hartmann's mountain zebra. Many of these species probably didn't live here permanently but would have moved through the area when food and water was available.

Many birds, insects and smaller mammals and some predators still remain in the area. There is enough plant food to support the remaining herbivores. The Cape leopard is the largest local predator. **What can we do now to prevent more animals becoming extinct in our country? Can you think of ways to protect the natural wildlife?**

Succulent Poaching

The succulents that make the succulent Karoo famous are sadly often targeted for illegal collection for the horticultural trade. It is illegal in South Africa to remove plants such as these from the wild without a permit and punishments for those caught can be severe.



While the annual daisies put on their show, they are not the only natural wonders in the area. This region of South Africa has 15 subregions which show different types of vegetation:



- Arid Estuarine Salt Marshes
- Kamiesberg Mountain Scrubland
- Namaqualand Arid Grassland
 - Namaqualand Blomveld
- Namaqualand Coastal Duneveld
- Namaqualand Heuweltjies Veld
- Namaqualand Inland Duneveld
- Namaqualand Klipkoppie Scrubland
 - Namaqualand Rivers
 - Namaqualand Salt Pans
 - Namaqualand San Fynbos
- Namaqualand Seashore Vegetation
 - Namaqualand Strandveld
- Riethuis Wallekraal Quartz Vygieveld
- Augrabies Plains Sandy Grassland



This list is not for you to memorise! It simply shows the rich diversity and treasure that this one biome holds – even if at surface glance it all looks the same to our untrained eyes.



Remember to find a treasure for your treasure chest while you explore this biome. Perhaps a pressed flower would be a good reminder of your visit to Namaqualand. You decide!

Now, let's go and investigate how real treasure is a threat to the natural environment in this biome. If we drive all the way up the N7, which is one of South Africa's national roads, we will pass through the popular town of Springbok. Springbok sprung up as a mining town.

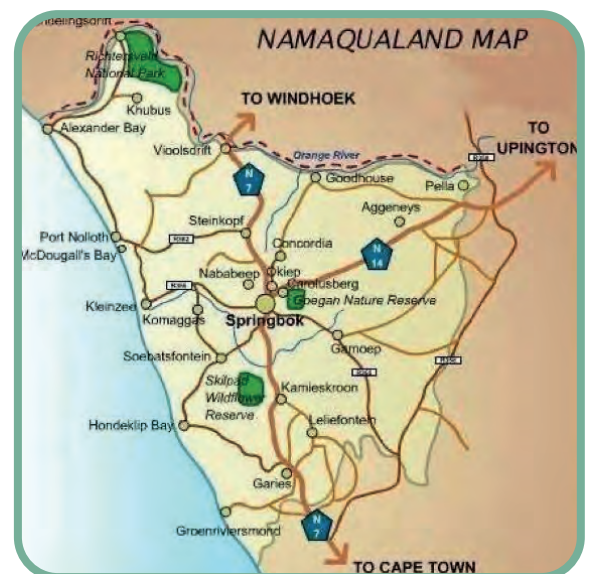
Springbok

The town of Springbok is set in a narrow valley that cuts through the granite domes of the Klein Koperberge - which means "small copper mountains." The colourful history of Springbok is closely linked to the copper industry and is also the site of the first commercial mining operations in the country.

Although locals had probably always known there was copper there, the site was 'officially' discovered in 1685 by an expedition, commissioned by the Governor Simon Van Der Stel, but at that time the deposit was not considered worth mining. It was only in 1852 that the first copper mine was brought into operation by the mining concern of Philips and King and in 1862 the town of Springbokfontein was laid out. **How do you think the town got its name?**

Rich copper deposits were discovered in the 1870's to the north of Springbok at Okiep. Potential miners flocked to Okiep, where the deposits were found. The steady supply of drinkable water from the spring of Springbok made the town the centre for the mining prospectors.

Copper is not the only substance that is mined in the succulent Karoo biome. The treasure that poses a serious threat to the environment is diamonds.



Alluvial Diamond Mining on the West Coast

The west coast of Southern Africa is known as "The Diamond Coast".

To know why it has been dubbed this, we need to look at the last treasure of Namaqualand. At the north of the succulent Karoo biome is the South African border, which is formed by the Gariep River (also known as the Orange River).

The Orange River is South Africa's longest river. It runs almost right across the width of South Africa starting in the Drakensberg mountains in Lesotho and emptying into the Atlantic Ocean some 2 200km further on. The Orange River flows along the border of the Free State, south west

of Kimberley and joins the Vaal River.

In 1867, the first diamond discovered in South Africa, the Eureka Diamond, was found near Hopetown on the Orange River. Two years later, a much larger diamond known as the Star of South Africa was found in the same area, causing a diamond rush. This area was soon overshadowed by the rush to mine diamonds directly from the kimberlite deposit discovered at Kimberley in 1871, although *alluvial diamonds* continued to be found in the Orange River.

What are Alluvial Diamonds?

Alluvium is loose clay, silt, sand, or gravel that has been deposited by running water, so *alluvial diamonds* refers to diamonds deposited by the Orange River, in this case.



In 1927 diamonds were also found south of the Orange River in South Africa and it was assumed that the coastline north of the river in Namibia would also contain diamonds.

In 1928, prospectors conducted a 300 kilometre expedition from Lüderitz in Namibia to the mouth of the Orange River. They found rich deposits of diamonds on the north bank of the Orange River and the adjacent northern coastline and established a tent camp, from which Oranjemund developed.

About two hours drive to the north-west of Springbok is the border post at Alexander Bay, a town which also grew due to the discovery of diamonds. It was named after Sir James Alexander, the person who had first mapped this area in 1836. If you look across the river, on the Namibian side, you will see the town of Oranjemund.

Today, several commercial diamond mines operate here, on the last stretch of the river. Diamonds are also mined in places on the middle stretch of the river, as well as the beaches and areas around the mouth of the Orange River. Further south, at various spots along South Africa's west coast, alluvial diamonds are also found and mined.

It might sound exciting to think that diamonds can be found washing down rivers into the ocean but actually, this is a tragedy for the natural environment. The methods used to extract gravel in huge quantities, to be sifted in search of diamonds, is devastating to the river and ocean floor and all the life that depends on it. Diamonds are not carefully picked up in the same way that you would collect pretty stones on the seashore, without harming anything around them. Quite the opposite!

For example, in offshore marine mining, divers 'vacuum up' the ground on a huge section of the seafloor, including all the little creatures living there. The gravel, including all the sea creatures that can't escape, is suction-pumped through a pipe up to a boat and later processed to find any diamonds in it. The entire area is disrupted and damaged!

Other methods used on land and in rivers are equally damaging. While humans mine one treasure, they are wrecking another by causing harm to the environment such as:

- Disturbance and destruction of marine life on mined beaches
- Destabilisation of fisheries and fishing communities
- Impacts on already scarce water resources
- Air pollution from mining activities
- Increased need for more roads and traffic
- Ugly sights on the beaches and landscape made by the mining operations
- Loss of access to beaches and coastline for recreational activities such as surfing and fishing
- Damage to the fragile dune system which is also an important part of the natural environment and vital for certain wildlife
- Knock-on impacts on the surrounding land-based ecosystems, the changes to the marine environment will have a wider effect on coastal wildlife
- Loss of indigenous heritage sites and valuable archaeological sites that should be preserved



Although some might argue that mining may bring more jobs and opportunities to a local community, these benefits must be carefully weighed up and balanced against the irreparable, long-term destruction that will also result from mining activities.

The west coast, including the fynbos biome and the succulent Karoo biome, is home to thousands of species of unique plants, most of which are found nowhere else in the world. The whole area is a biodiversity hotspot with the largest concentration of succulent plants in the world. Every effort should be made to protect this natural heritage from harm.

Alexander Bay

While we're here, there are a few other interesting things to know about Alexander Bay, which as you'll see is now almost a deserted 'ghost town' as the big mining company that used to operate here has gone. Diamonds are still mined, but only on a small scale. Even though there is no tourist accommodation in the town, a day trip to visit Alexander Bay is a must for any birder or rock lover! The area is rich in smooth pebbles and semi-precious stones.



Besides diamonds, there are wetlands at Alexander Bay, which are home to a variety of migratory birds. These wetlands at the Orange River mouth have been declared a Ramsar Site. This means that the wetland site is considered to be of international importance.

What is a Wetland?

A wetland is a distinct ecosystem that is flooded by water, either permanently or seasonally. Wetland habitats serve essential functions in an ecosystem, including acting as water filters, providing flood and erosion control and providing food and homes for fish and wildlife. Many wetlands are not wet year-round because water levels change with the seasons. There are a number of wetlands in South Africa and they are all sensitive areas, rich in biodiversity, that need to be protected.



The endemic Barlow's lark can be found along the river banks. It is threatened because the places where it lives, breeds and feeds are under threat. Unfortunately, this wetland is currently under major threat from several sources. This includes reduced water flow and desertification but efforts are underway to restore the area.

Just outside the town, near the turnoff to Alexander Bay, an interesting field of green and orange lichen is growing on a hill. These lichen fields are soon to be declared part of our national heritage.



As we've reached South Africa's northern border at Alexander Bay, this is where our journey through the succulent Karoo ends, so we are going to turn around and head back to where we came from.

What a trip! We've seen the dry Karoo scrub or the Nama Karoo with sheep grazing under a shepherd's tree, we've said "Wow!" to the magnificent daisies of Namaqualand in the succulent Karoo and we've been thrilled by the idea of diamonds washing onto beaches, but we've also realised that the love of diamonds and mining destroys so many living things and the places where they survive.

While you travel home tell someone all you remember about:

- The shepherd's tree

And do you remember:

- What were the first two diamonds found in South Africa called?
- What are the names of the two towns on the opposite sides of the Orange River called?
- What are three treasures found in Namaqualand?



Remember to check the course website for enrichment resources.

Section 2: Assignments

Complete all the mapwork assignments and no less than six of the others.

Mapwork

- 1) On your large wall map, mark all of the places, rivers and towns you learnt about in this section.
- 2) Draw a "Flower Route" on a map that tourists could take to see the Namaqualand flower display.
- 3) Choose one or more of the animals that no longer are found in the Karoo and draw on a map where they are still found. Add extra facts about the animal such as their current numbers, the food they eat and the area they require for grazing and breeding.

Writing Assignments

- 4) Research and write an essay on a mammal, reptile or plant found in the Karoo. Illustrate it or create a computer-based presentation using PowerPoint or similar software. Include details about its physical traits, its feeding, breeding and home.
- 5) Research the dangers of fracking and write an argumentative essay or set up a family debate around the proposed Shale Gas Extraction project – divide the family between those arguing for and those against fracking.
- 6) The Orange River has had many names. Do research and find out all the names and what they mean.
- 7) Pretend that you are a person living in the Karoo and write a letter to protest the proposed Shale Gas Extraction. You could write a formal letter either to your local mayor, the Shale company or to other environmental groups.
- 8) Write or type a newspaper report to celebrate the victory of environmentalists and protestors, when the proposed Shale Gas Extraction project in the Karoo was stopped.

9) Create a travel brochure to encourage international tourists to visit South Africa to see the Namaqualand flower display in spring. Create a bold and exciting cover and give your tour a name. Include an appealing description of the wonders of the flowers and the journey around the region. Be sure to include tour dates, the costs, what is included in the package, accommodation and additional trips or costs. (You can make these up!)

Practical Hands-On Activities

10) Add one treasure for this section to your treasure chest. It could be a pressed flower, a rock you collected or a photo taken at an outing during this section.

11) Plan a family trip to any of the three areas you have learnt about. Look for a route, places to stay and attractions to visit. Type up your findings in a document and give it to your parents to consider. Use pictures to make it more appealing!

12) Make a travel poster inviting people to visit one of the towns in any of the areas you studied in this chapter. (*www.canva.com has some ready-made templates for you to use*)

13) Investigate the Karoo koppies (dolerite sills) and see if you can figure out what geologists are missing in their thinking. (*HINT: consider Noah's Flood*)

14) Do you know how much rain falls in the region where you live? Research the rainfall in your area by tracking rainy days and sunny days. You can also make a rain gauge and check it daily. Be sure to look on the course website for the Youtube video for this craft. Start keeping a weather chart for a month.

15) Investigate sheep farming in South Africa. Make a poster showing the sheep varieties in South Africa and which are used for meat, wool or meat and wool. Make sure to include pictures of them and a map showing where they are found. You can make a copy of the blank map in the appendix.

16) Make your own daisy garden. Purchase a pack of Namaqualand daisy seeds and prepare the ground and sow the seeds according to the instructions.

17) Build a paper model of the Khoisan and Khoikhoi homes and villages. You can find a link to printable models for these on the course website.

18) Make a poster or model to show how to frack for gas underground. Use clear labels and add detailed descriptions of all the negative and positive aspects of this energy.

19) Research the ongoing threats to the west coast of South Africa and the work of activists such as *Protect the West Coast* that seeks to stop the reckless mining activities. Create a pamphlet or flyer that you could give to residents and visitors in the area to inform them about the problem and tell them what they could do to help. Try to come up with ideas of activities to promote awareness - perhaps a poster, a bumper sticker campaign, a newspaper letter-writing campaign. What else could you do?

Notes:

[illegible]



Footprints



Nature Quest

Footprints Nature Quest will take you and your children on a living journey across the beautiful land of South Africa crossing from coast to coast, climbing to the top of our mountains and rafting down our rivers. You will discover some hidden secrets of our land as you tunnel with a family of meerkats through the Kalahari, travel up the West Coast to see the Namaqualand daisies and even head out to the ocean to learn about amazing sea birds – and marine giants.

Each section contains all the information you need and along with the recommended reading books, equips you to dig deeper into the richness of South African plants and animals, landscapes and skies.

This Charlotte Mason nature study curriculum is designed to make your homeschooling journey pleasurable and tantalising and create in your children a love for learning and for their country.

About the Authors

Shirley Erwee and Wendy Young are two veteran home educating moms of over 20 years, with six and four children respectively. Shirley has a Bachelor of Arts degree, followed with an Honours degree in English Language Teaching, while Wendy has a Bachelor of Arts degree in Geography, Biblical Archaeology and English Literature. Since 2002, their Footprints enterprise has provided South African home education resources that give insight into our country's past and the present and also inspire our children to play a part in building a bright future for our nation.