



# SSC DIVE IN!

## MIGRATION





# WELCOME!

Hello, and welcome to “SSC Dive In!” - packs of resources providing seaside fun directly into family homes and classrooms.

This pack’s theme: **Migration**

Migration is all about the movement of animals from one place to another. In this pack we will look at how and why a range of birds and animals found in or around the sea make these journeys. We will answer questions such as: What does migration involve? Why do birds and other animals do it? How do they do it? Answers revealed, plus fun activities inside!

## Inside this pack:

- **Discover: Migration**
- **Blog: Migration Myths & Methods**
- **Spotlight: Species Migrations**
- **Discover: Unexpected arrivals**
- **Puzzle: Migration Maze**
- **Experiment: Aerodynamics**
- **Quiz: Test Yourself**
- **Craft: Pull tab migration map**
- **Glossary**

**We’d love to hear from you!** If you’ve had fun having a go at activities, experiments and crafts, let us know. Any comments or pictures can be sent to [marineengagement@seabird.org](mailto:marineengagement@seabird.org). More resources available on our [website](https://www.seabird.org/website).

**Enjoy using our packs and want to see more?** The Scottish Seabird Centre is an environmental conservation and education charity. Every penny we raise helps us deliver our important conservation and education work. If you enjoy using our resources and would like to support our work, please consider making a donation to our [JustGiving page](https://www.seabird.org/JustGiving). Thank you.

We hope you enjoy diving in to the pack!

**Scottish Seabird Centre Learning Team**





# DISCOVER

## MIGRATION

### WHAT IS MIGRATION?

The movement of animals from one place to another with the changing seasons.

### WHICH ANIMALS MIGRATE?

From tiny insects to huge whales, migration occurs in all the major animal groups. In Scotland some species arrive here for the winter from colder parts, while others are absent in winter but return in the spring and summer. Birds are one of our most noticeable migrants but other migratory species include butterflies, bats, fish and whales.



### WHY DOES IT HAPPEN?

The main reasons for migration are availability of food, the search for a safe place to **breed** and the need for a suitable **climate**. Many butterfly species will migrate because they simply cannot survive dropping temperatures. Changes in season can affect the amount of food available to eat. Animals can either stay and cope with change, or move to find more food and better conditions. Having a safe place with a plentiful food supply is essential for breeding and raising young.



### HOW DO ANIMALS KNOW WHEN IT'S TIME TO MIGRATE?

Changes in temperature and in the length of day are factors which drive migration. For birds, the gradual change in the length of day triggers glands in the birds bodies to release special chemicals, called **hormones**. The hormones make the birds behave differently—they become restless, gather in flocks, and eat more food. Some species also '**moult**', a process where they shed their feathers and grow new ones for the journey. Once their bodies are ready, the birds wait for a period of calm weather then off they go!

### HOW DO ANIMALS PREPARE FOR THE JOURNEY?

Migration takes a lot of energy, so animals need to eat plenty to build up their fat reserves and fuel them on their journeys. Many species will also congregate in large groups before travelling together as journeys can be dangerous and there is safety in numbers.

Check out our Dive In Pack on [Seasons](#) for more on how plants and animals adapt to changing conditions.





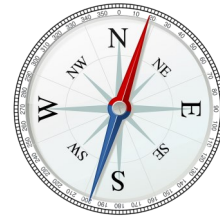
# DISCOVER

## MIGRATION (CONTINUED)

### HOW DO ANIMALS KNOW WHERE TO GO?

Some learn from their parents, whilst others navigate all by themselves. Scientists are still finding out how they do this. Theories include:

- Using landmarks, such as mountains, rivers and coastlines.
- Using the position of the sun and stars.
- Detecting changes in the earth's **magnetic field** (the closer to the **equator**, the stronger the magnetic field).



Occasionally, birds can lose their way, particularly if there are strong winds. Birds that are blown off course and are seen outside of their usual range are known as **vagrants** (pronounced "vay-grants").

### HOW DO SCIENTISTS STUDY MIGRATION?

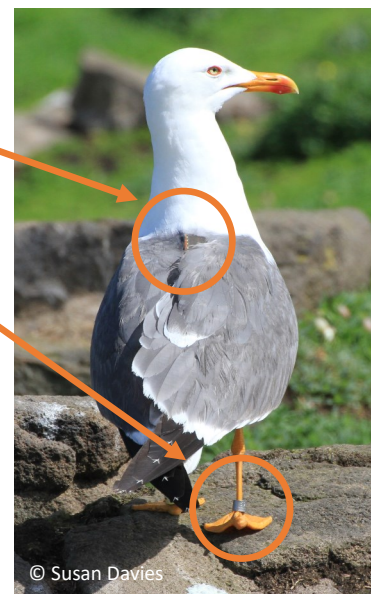
'**Geolocators**' - small electronic devices attached to animals that detect where the bird travels and stores its route (a bit like a GPS).

'**Ringing**' - the process of attaching a small ring around the leg of a bird with a unique code on it. Birdwatchers report rings when they spot them, allowing researchers to see where birds have travelled.

Discover more on page 8.

### WHAT HAZARDS DO ANIMALS FACE DURING MIGRATION?

- Bad weather and storms might blow them off course.
- They may collide with wind turbines and other tall objects.
- They could be eaten by **predators**.
- They could run out of energy.



### DID YOU KNOW...

Geese travel in a 'V' formation to save energy. In fact, scientists have shown that birds in V formation can fly **70%** further than one bird flying alone. This is because the geese at the front change the flow of air so individuals at the back don't have to work as hard. The geese then take it in turns to be in the more tiring position at the front. Now that's team work!







# DISCOVER

## SEABIRD MIGRATION—WHO GOES WHERE?

Most seabirds in the UK are summer visitors—they breed and raise their young between May–October then leave for the winter. But where do they go?

Below are a few examples of the extraordinary journeys seabirds make from the Firth of Forth, Scotland.



© Phil Wilkinson

### ATLANTIC PUFFIN

Puffins leave their UK summer breeding grounds in August and travel to the middle of the North Atlantic and Arctic Ocean for the winter. They stay on the open ocean, floating on the sea in groups called 'rafts'. They return to their breeding colonies in March/early April.

### NORTHERN GANNET



© Rob McDougall

By the end of October, all the gannets have left Scotland for their migration South. Some individuals travel as far South as the West coast of Africa, spending their time at sea until it's time for them to return to the UK in February.

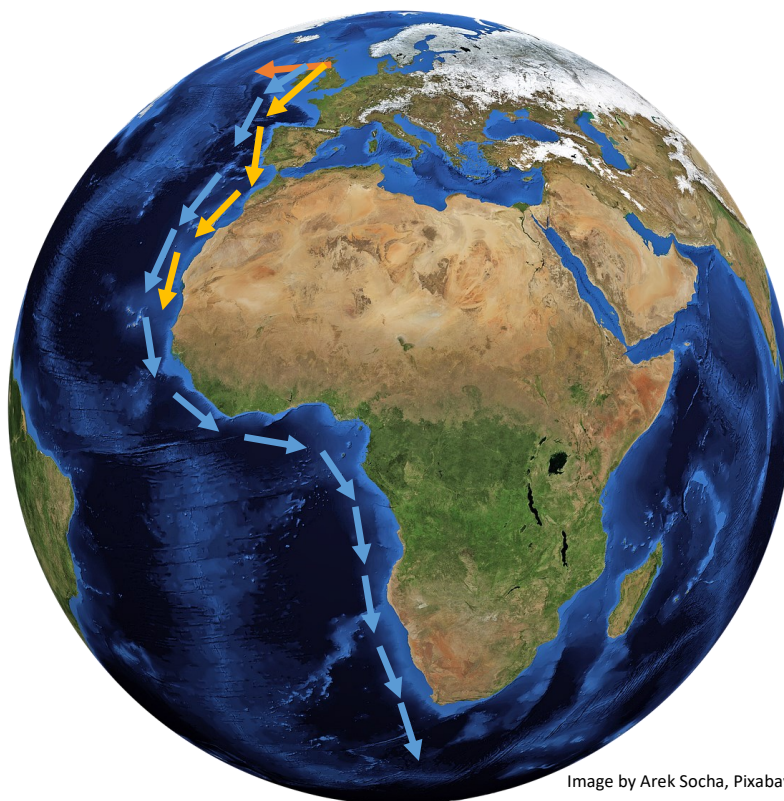


Image by Arek Socha, Pixabay

### ARCTIC TERN



© Greg Macvean

Believe it or not, this little bird undertakes the longest migration on the planet. Some individuals travel from the Arctic to the Antarctic and back again in one year. That's between 44,000 and 59,000 miles each year—the same distance as flying to the moon and back three times over its lifetime! (See spotlight page for more info).

Those that breed in Scotland leave in August and arrive back in May.

*Seabirds use landmarks and the coastline to navigate as they migrate.*



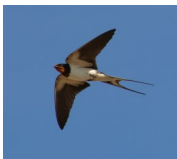


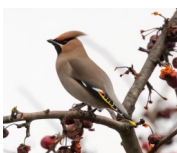
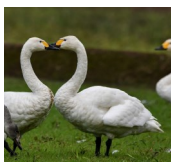





# DISCOVER

## BIRDS TAKING FLIGHT

Imagine you are at an airport with planes going to and from exciting destinations all around the world. In a way, Scotland is just like a large international airport for birds with species coming and going at different times of the year. It's not just seabirds—millions of other birds migrate to and from Scotland with the changing seasons. See the table below for a list of iconic bird species to arrive and depart our country every year.

Species	Arrival time 	Travelled from	Where to see them	Departure time 
Swallow 	April – May	South Africa	Sitting on telephone wires or chasing insects across fields and water. Look out for their long tails.	August – October
Swift 	April – May	Africa	Flying high in the sky, looking like little boomerangs, making distinctive 'screaming' calls.	July – September
Cuckoo 	April – May	Africa	Woodlands, reed beds and moorlands. A pigeon-like bird with a loud and iconic 'coo-coo' call.	June – July
Waxwing 	October— January (Anytime in winter)	Norway, Sweden, Finland & Russia	Eating berries, especially rowan berries, in trees and bushes. A bird with distinctive colours and crest.	Late winter and early spring.
Whooper swan 	September— November	Iceland	In estuaries, wetlands and farmland. A white swan with a big yellow patch on its beak.	April—May
Purple sandpiper 	August onwards	Scandinavia, Svalbard & Greenland	A small, plump bird that can be seen walking across rocks and seaweed at the seaside.	May—July

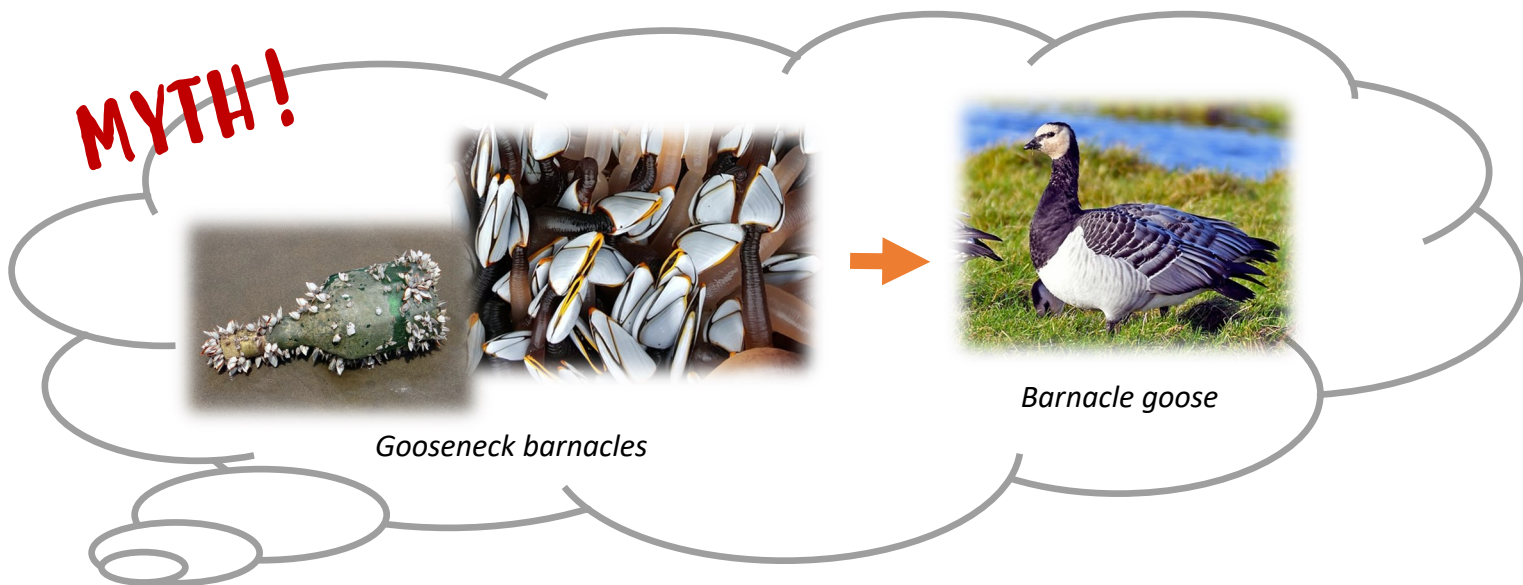
### ARRIVAL & DEPARTURE TIMES EXPLAINED...

Some species, such as swallows, arrive in Scotland in the spring after long journeys from the south. They come to breed and raise a chick, then leave for the winter. However, for species living in northern countries such as Iceland and Scandinavia, Scotland is warmer and an easier place to find food in the winter. Species, such as waxwings, fly to us in the autumn, feed in Scotland over the winter, then depart in the spring.

## MIGRATION MYTHS & METHODS

Back in time, before we understood migration, people had wacky ideas about how some animals get here and where they go. For example, [barnacle geese](#) were thought to come from... you've guessed it—barnacles!

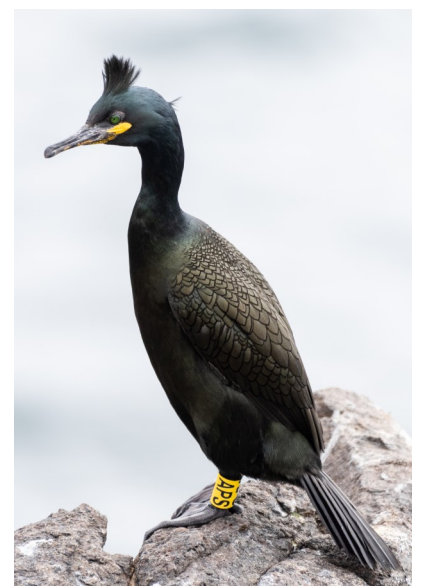
Because they fly off to Arctic regions to raise their chicks in summer, nobody in Scotland ever saw the chicks, the eggs, or even a nest. The only logical explanation (or so people thought) was that the [gooseneck barnacles](#), which sometimes float onto our shores on driftwood and litter (see photo below), were in fact tiny geese clinging by their beaks!



So how did we discover these myths aren't real? By observing and following animals we've been able to discover where most of them go and why.

In the past, scientists had to travel the world to see where animals go for themselves, or rely on information from people in different countries. This would take a long time and wasn't the most accurate way of studying migration so, to get around this, bird scientists invented a clever method called 'ringing'.

Ringling is when a small labelled metal or plastic ring is attached to the leg of a bird. Each ring has a unique number or code so an individual can be identified by the ring on its leg each time it is spotted. Sightings of the code are then documented and scientists can then map where the bird has been seen around the world.



*A shag with a unique yellow ring on its leg © Jamie McDermaid*

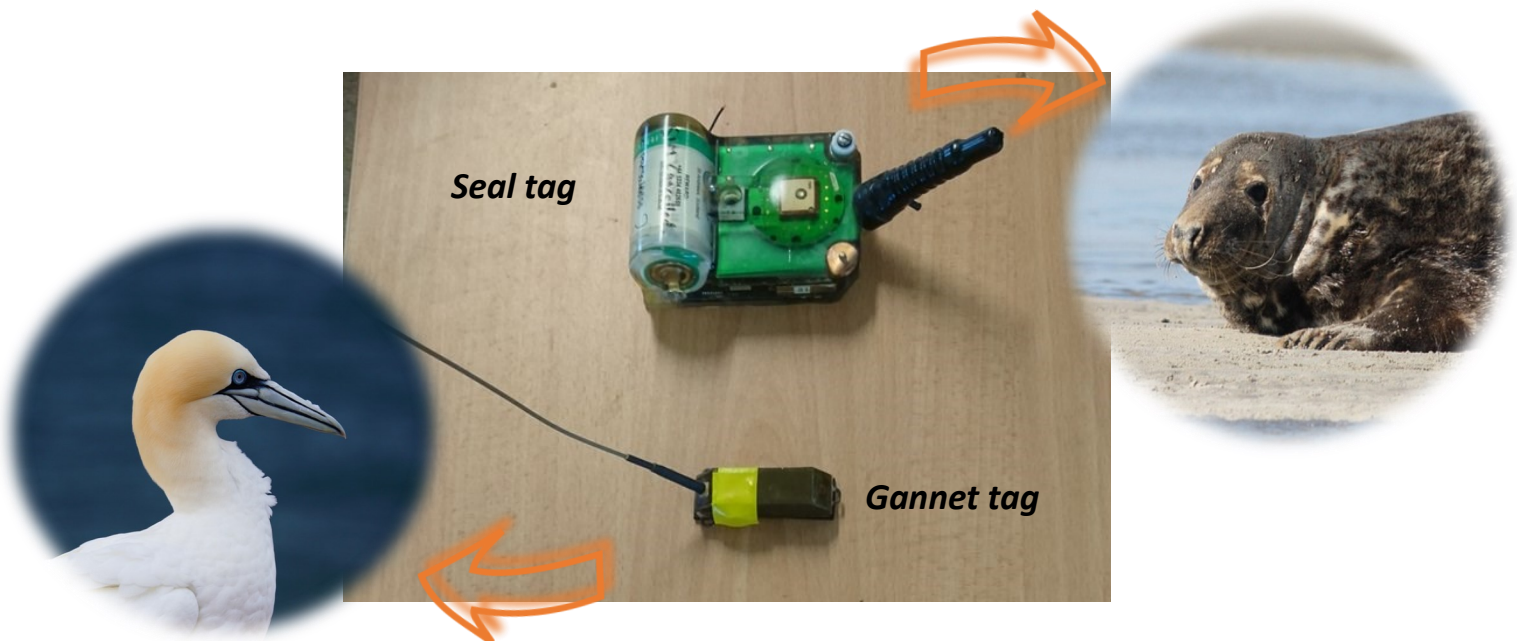
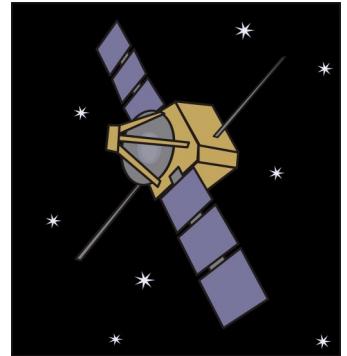


# BLOG

Nowadays, ringing is still a useful method for studying bird movements, but improvements in technology have meant we can now track birds and other animals without seeing them for ourselves.

Geolocators, also known as remote tracking devices, are pieces of technology that are attached to animals to find their location. Most tracking devices work like a GPS (Global Positioning System) — a device that emits a signal to a satellite in space, which then sends down a location to a computer - similar to using a SatNav or Google maps.

Geolocators come in all sorts of shapes and sizes. Larger land animals have special collars that go around their necks, birds have small tags glued to their feathers (like the small black box in the photo below), whilst larger marine animals such as whales and seals have special tags stuck onto their backs (see the larger green box below). Whilst this may sound intrusive, scientists are always careful not to cause harm or distress to the animals when attaching tags.

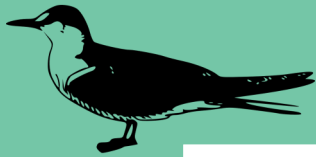


Attaching geolocators is important for animals as they give scientists insights into the areas they are using. Humpback whales, for example, feed and breed in different areas, so knowing the locations of these means scientists can work towards protecting these important areas in the future.

As technologies and methods of studying migration improve, answers to questions that have stumped scientists for years are being revealed. Amazingly, scientists can now tell where animals have been by studying their chemistry. As animals move from place to place, they eat different plants. Traces of these plants can then be found in samples taken from tissues or feathers.

Thanks to science, we know more about the incredible journeys animals face than ever before but there are still plenty of mysteries to solve.





# SPOTLIGHT

## ARCTIC TERN MIGRATION



© Greg MacVean

### WHERE TO SEE IN THE UK:

Arctic terns form colonies along coasts and islands in west and northern Scotland, i.e. Orkney islands, in the summer. Some rest at lakes and reservoirs on their long journeys.

### Arctic tern

*STERNA PARADISAEA*

**DISTRIBUTION:** Worldwide. Northern **hemisphere** (such as the Arctic) in the summer. Southern hemisphere (such as the Antarctic) in the winter.

**LENGTH OF MIGRATION:** Between 44,000 and 59,000 miles each year. The arctic tern holds the records for the longest migration of any animal. In their lifetime, one arctic tern can fly the equivalent of flying to the Moon and back, three times.

**POSSIBLE HAZARDS:** Lack of food on their journeys can cause birds to lose weight and prevent them from successfully rearing a chick. Storms can also damage colonies and blow terns off course.

### MIGRATION ROUTES:



To learn more about these incredible animals visit:

British Trust for Ornithology at: [www.BTO.org](http://www.BTO.org)



# SPOTLIGHT

## HUMPBAC WHALE MIGRATION



Photo by Brigitte Werner on Pixabay

### Humpback whale

MEGAPTERA NOVAEANGLIAE

**DISTRIBUTION:** Found in all of the world's oceans

#### LENGTH OF MIGRATION:

The longest migration recorded by a humpback whale was from the seas off Brazil to Madagascar— over 6,000 miles.

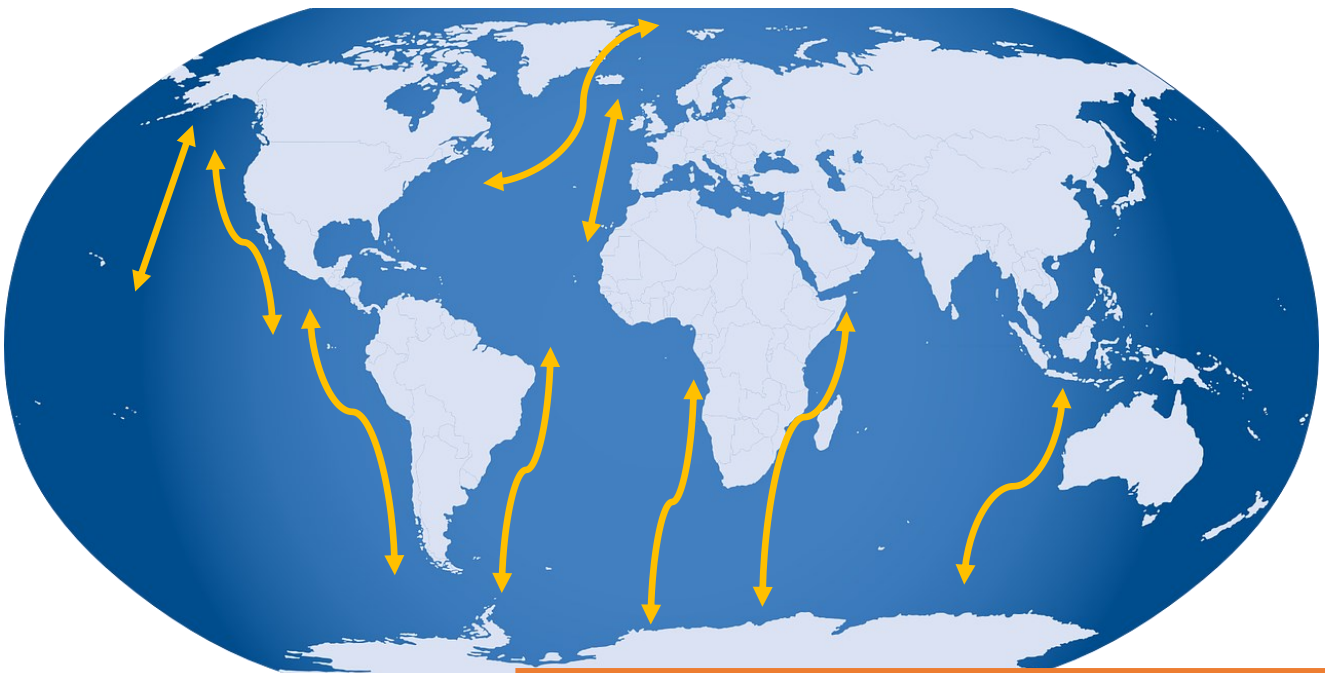
#### WHERE TO SEE IN THE UK:

Mostly along the West and North coasts as they migrate up in the spring and down in the autumn. Migrating whales swim along the west coast into the Firth of Forth in the winter.

Humpback whales spend a lot of time on the move and undertake some of the longest migrations of any mammal on the planet. They feed on fish and krill in cooler waters before making their way thousands of miles to the warmer waters to mate and raise their calves.

**POSSIBLE HAZARDS:** Ship strikes (when boats collide with a whale), becoming tangled in fishing nets and whalers (people who hunt whales).

#### MIGRATION ROUTES:



To learn more about these incredible animals visit:

**Whale and Dolphin Conservation website** at [www.whales.org](http://www.whales.org)

**Sea Watch Foundation website** at [www.seawatchfoundation.org](http://www.seawatchfoundation.org)



# SPOTLIGHT

## ATLANTIC SALMON MIGRATION



### WHERE TO SEE IN THE UK:

They can be seen leaping up rivers in the north and west of the UK in the autumn months.

### POSSIBLE HAZARDS:

Salmon have to navigate their way around obstacles such as dams as they make their way up and down rivers. **Predation**, pollution and fishing can also be a problem for salmon.

## Atlantic salmon

**SALMO SALAR**

**DISTRIBUTION:** Found in the Atlantic ocean

**LENGTH OF MIGRATION:** A journey across the Atlantic is approximately 2,000km, though some individuals will travel much further.

The migration pattern of the Atlantic salmon takes place across its lifespan. Their lives begin in freshwater streams and rivers but, once mature, they migrate to the sea to feed and grow. After spending several years in the ocean, when it is time to reproduce, they migrate back to the same river or stream they were born in to **spawn**.

### MIGRATION ROUTES:

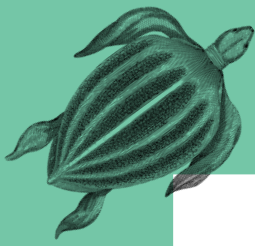


To learn more about these incredible animals visit:

**Atlantic Salmon Trust** at [www.atlanticsalmontrust.org](http://www.atlanticsalmontrust.org)

**Oceana** at [www.oceana.org/marinelife](http://www.oceana.org/marinelife)





# SPOTLIGHT

## LEATHERBACK TURTLE MIGRATION



© Liz Christides

### WHERE TO SEE IN THE UK:

A rare species to spot in the UK. Best chance to see one is on the South and West coasts in the summer.

### POSSIBLE HAZARDS:

Plastic is a big problem for leatherback turtles because they mistake it for their favourite food—jellyfish. The turtles eat the plastic which gets stuck in their throats. Turtles can also get caught in fishing nets.

### Leatherback turtle

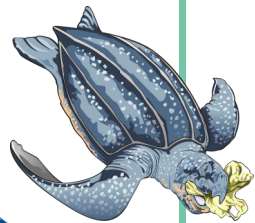
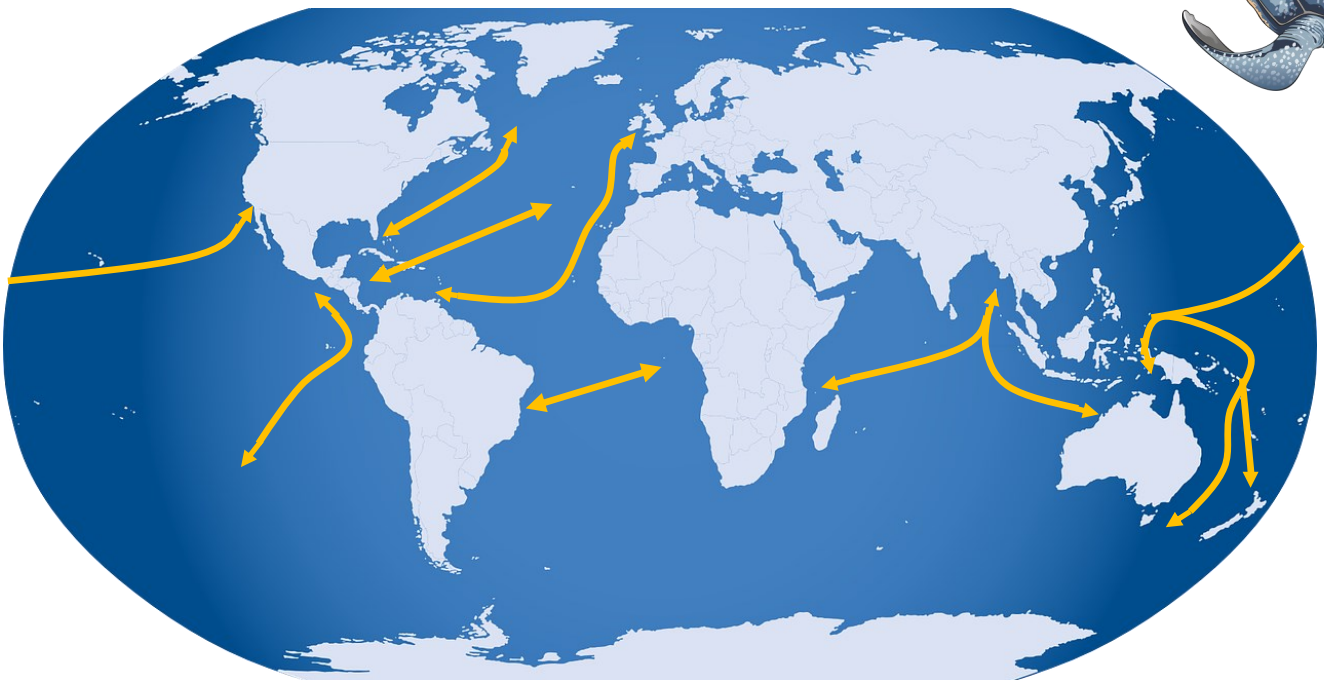
*DERMOCHELYS CORIACEA*

**DISTRIBUTION:** Atlantic, Pacific & Indian oceans

**LENGTH OF MIGRATION:** Over 7,000km

Leatherback turtles can travel long distances from feeding waters to breeding waters. In some cases, individuals travel across an entire ocean. Unlike other turtles, leatherback turtles can keep their bodies warm, meaning they can migrate to colder, deeper places than other turtles. Each migration route depends on the individual.

### MIGRATION ROUTES:



To learn more about these incredible animals visit:

**Oceana** at [www.oceana.org/marinelife](http://www.oceana.org/marinelife)



# SPOTLIGHT

## PINK-FOOTED GOOSE MIGRATION



### WHERE TO SEE IN THE UK:

Scotland and north/east England are the most common regions for pink-footed geese in winter months. Estuaries along the east Scottish coast, such as [Montrose Basin](#) and [Aberlady Bay](#), are excellent places to see large gatherings of pink-footed geese.

### Pink-footed goose

ANSER BRACHYRHYNCHUS

**DISTRIBUTION:** Pink-footed geese breed along the coast of Greenland, Iceland and other sites in the Arctic Circle in the spring and summer. Most of them then migrate south to Britain for the autumn and winter.

### LENGTH OF MIGRATION:

Individuals travelling to Scotland from Iceland can travel over 700 miles each way. Some geese travel even further.

**POSSIBLE HAZARDS:** Storms can blow geese off course and make their journey more tiring.

### MIGRATION ROUTES:



To learn more about these incredible animals visit:

British Trust for Ornithology at: [www.BTO.org](http://www.BTO.org)

Other goose migration info: [Birdfact website](#)

## BAR-TAILED GODWIT MIGRATION



### WHERE TO SEE IN THE UK:

Bar-tailed godwits can be found around UK shores in the winter months. They prefer low-lying areas, especially estuaries and grasslands.

### Bar-tailed godwit

LIMOSA LAPPONICA

### DISTRIBUTION:

Breeds in the northern hemisphere in places such as Scandinavia, Siberia and Alaska, then travels south for winter. Some stay in the UK for winter whilst others travel further south, sometimes reaching as far south as West Africa.

### LENGTH OF MIGRATION:

Depends on the individual and migration route it follows. The longest migration by a bar-tailed godwit, and the record for one of the longest non-stop flights, goes to birds that travel across the Pacific Ocean—9 days of non-stop flying!

### POSSIBLE HAZARDS:

Strong winds can cause birds to abandon their journeys, leading to them turning around mid-way through their migration and wasting energy.

### MIGRATION ROUTES:



To learn more about these incredible animals visit:

British Trust for Ornithology at: [www.BTO.org](http://www.BTO.org)





# DISCOVER

## UNEXPECTED ARRIVALS

### Sometimes, animals appear in unusual places...

When an animal (usually a bird) is spotted in a place where it is not normally found, it is referred to as a **vagrant**. These unexpected visitors might have been blown off course by strong winds during their migration or have simply become lost on their journey due to lack of experience. When an unusual bird is sighted far from its usual home this can cause great excitement among bird watchers, who might travel long distances to catch a glimpse of a bird they have never seen before.



© Imogen Warren shutterstock\_1416229298

### “Albert” the Black-brown albatross

In 1967, Bass Rock had a surprise visit from a Black-browed albatross—a species usually found in the southern **hemisphere**. This single albatross crossed the **equator** and remained on Bass Rock from May to September and even attempted **courtship** displays with the gannets. The bird was given the name Albert and followed closely by scientists and excited bird watchers.

### A Surprising Sei-ght

It's not just birds that can find themselves unexpectedly off-course. Some whales can wander off their deep water migration routes in the Atlantic ocean and are sighted around Scotland. In the spring and summer of 2021, a Sei whale was sighted in the Firth of Forth. The Sei whale is the third largest **baleen** whale on the planet and is usually found in sub polar and sub tropical areas. Some people were lucky enough to catch a glimpse of its fin from the shore or a boat.



*Sei whale spotted in the Firth of Forth © Ronnie Mackie*

Bird watchers and whale spotters might be pleased at unexpected sightings of species far from home but an increase in the number of vagrants could be a warning sign about changes in the natural environment. It is really important that sightings are recorded so that patterns can be studied. Bird records can be submitted through the British Trust for Ornithology's [BirdTrack](#), while the Sea Watch Foundation's [Whale & Dolphin Watch](#) enables the recording of whale and dolphin sightings.

# PUZZLE

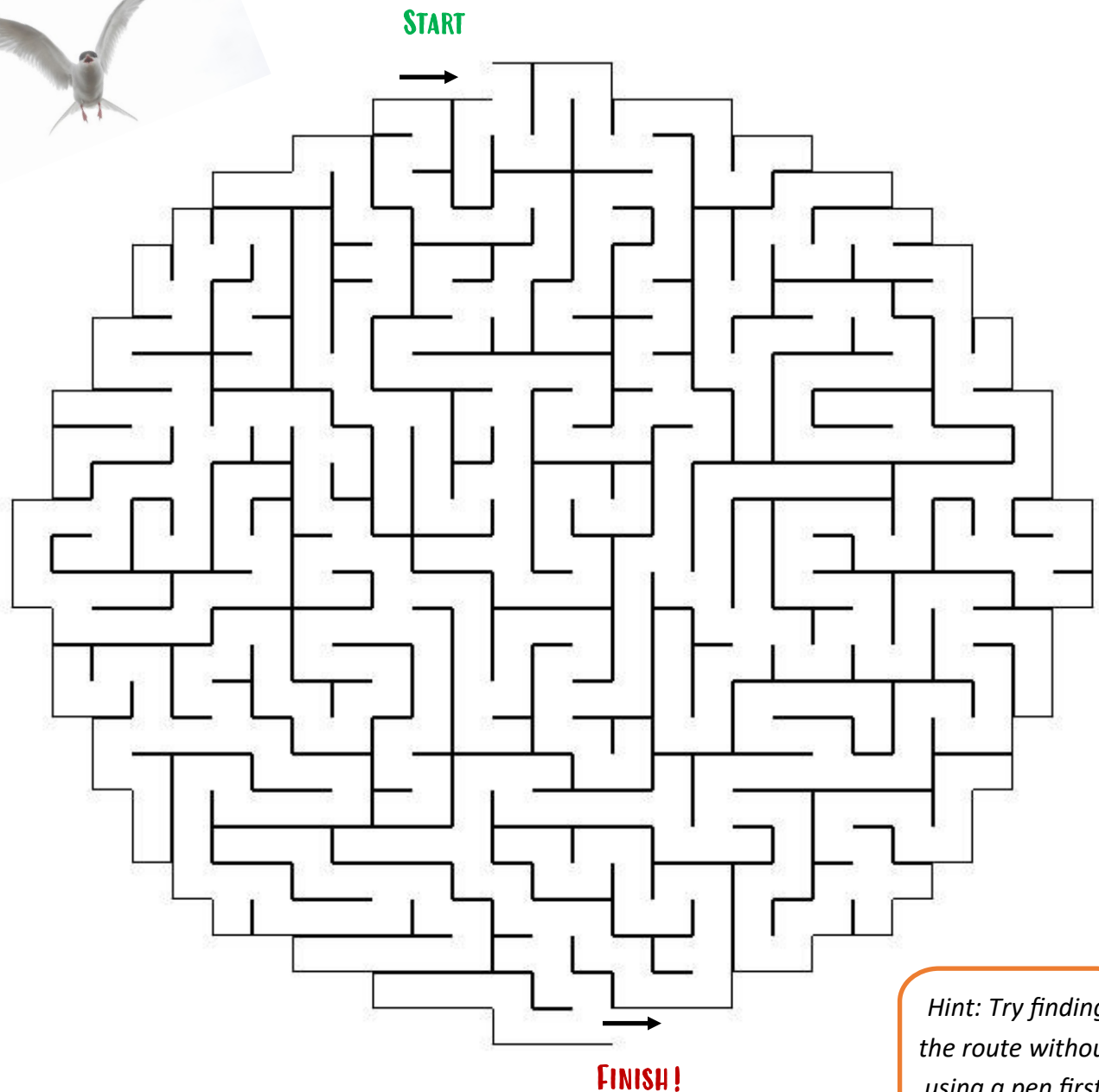


## MIGRATION MAZE

Can you help this arctic tern reach its winter home? Find the right route through the maze to complete the migration.

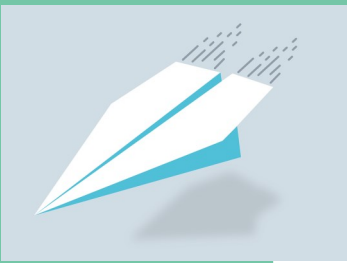


© Greg Macvean



*Hint: Try finding  
the route without  
using a pen first.*





# EXPERIMENT

## AERODYNAMICS



### QUESTION: HOW DO BIRDS MIGRATE?

Birds make it look so easy, but no matter how hard we flap our arms we will never fly.  
Why?

It's all to do with the shape of birds bodies and physics!

### TEST

A test to see what shape makes a paper aeroplane travel the furthest.

#### WHAT DO I NEED?

- Paper
- Paper airplane instructions
- Results table
- Tape measure (optional)

- 1 Select 3 paper airplane designs that you want to test. You can design your own or look for design ideas online.
- 2 Construct 1 paper airplane for each design. You can even decorate them or give them a name.
- 3 Stretch out your tape measure if you have one, or have something at the ready to indicate where each plane lands (any object will do).
- 4 Stand in the same place (the beginning of the tape measure if you have one) and throw each plane, one at a time. Record how far they travel by measuring the distance or noting the position of each plane, e.g. 1st, 2nd and 3rd (1st should be for the plane that travels the furthest distance). Record each result in the table (next page), then repeat 2 more times.
- 5 Complete the results table and work out the winner! After three tries, the plane that travels the largest average distance or wins the most is the champion.

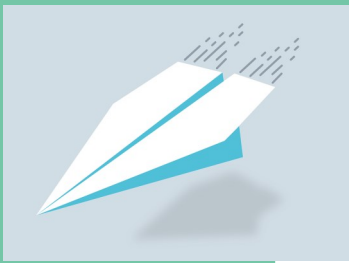
### ANSWER: AERODYNAMICS

'**Aerodynamics**' is the study of how objects move through air. Birds have the perfect mix of a light body, strong wings, and a '**streamlined**' body (a shape that moves easily through air or water). Plane wings are a similar shape to bird wings—see the 'The Science of Flight' on page 19 to discover why!

Different birds fly in different ways—some soar, whilst others flap continuously. Wings therefore come in different shapes and sizes to match the job they need to do.

Paper airplane wings don't flap, so the plane that travels the furthest is the one able to soar the longest.





# EXPERIMENT

## AERODYNAMICS

### TABLE OF RESULTS

Enter how far each plane travelled after each test in the table below. If distance can't be measured, write the position of each plane (1st, 2nd, 3rd) after each test is complete.

	Test 1	Test 2	Test 3	Average distance (optional)
<b>Plane 1</b> Distance or position				
<b>Plane 2</b> Distance or position				
<b>Plane 3</b> Distance or position				

To work out the average distance for each plane, do the following sums (or skip to the final result):

- 1 Distance 1 + Distance 2 + Distance 3 = total distance travelled.
- 2 Total distance travelled  $\div$  3 = average distance.

Remember to include  
units of measurement  
when writing results,  
e.g. metres (m).



### FINAL RESULT

After 3 tests, the plane that travelled the largest  
average distance, or came first the most, was: \_\_\_\_\_





# DISCOVER

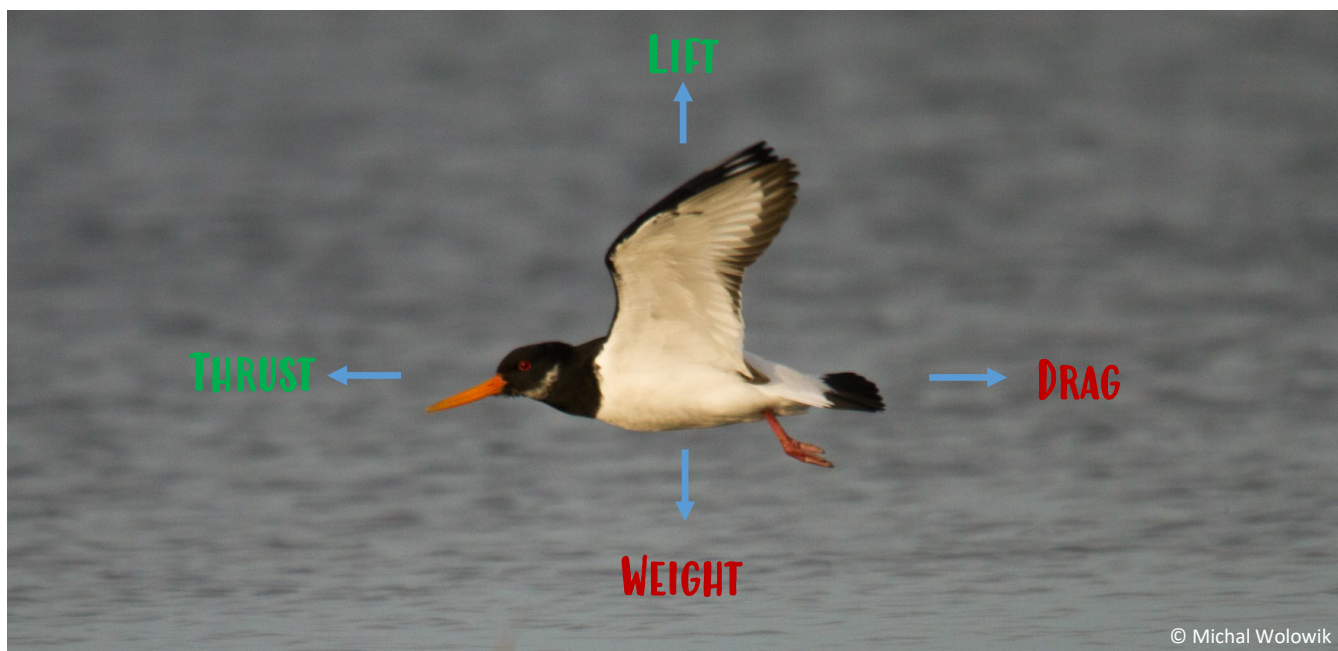
## THE SCIENCE OF FLIGHT

When birds fly, their bodies experience 4 **forces**.

A force is something that causes a change in the speed or direction of an object. Forces can be a “**push**” or “**pull**”.

To fly, birds need to get the right mix of forces:

1. **Weight** — the force that pulls the bird towards the ground. To balance their weight, birds must generate ‘Lift’.
2. **Lift** — the force that pushes the birds up, away from the ground. Lift is made by the shape of the wings.
3. **Drag** — the force that pulls the bird back as it flies and slows it down. To combat drag, birds need to generate ‘Thrust’.
4. **Thrust** — the force that pushes the birds through the air. Thrust is generated when a bird flaps its wings.



### DID YOU KNOW...

- A bird wing is described as an ‘**aerofoil**’ - something that is shaped in a certain way that allows the air to flow underneath it so it pushes the object up.
- Airplane wings are also aerofoils! The next time you’re in a plane, look out the window and imagine the air flowing underneath the wing, generating the lift that is keeping you in the air.



# QUIZ

## CHECK WHAT HAVE YOU LEARNED

**Note: The answers can be found on page 18.**

1	What word is used to describe birds seen outside of their usual range?	
2	The formation which geese fly in looks like which letter of the alphabet?	
3	Which species makes the longest migration of all?	
4	How metres can a humpback whale grow to in length?	
5	Which unusual bird made a surprise visit to Bass Rock in the 1960s?	
6	What term is used for the study of how objects move through the air?	
7	Which force pushes birds through the air?	
8	What is the name of the electronic devices attached to animals to detect their movements?	





# CRAFT

## PULL TAB MIGRATION MAP

Track the seasonal movements of the Northern gannet between Scotland and off the west coast of Africa by creating your own migration map with pull tab flying gannet.



### WHAT DO I NEED?

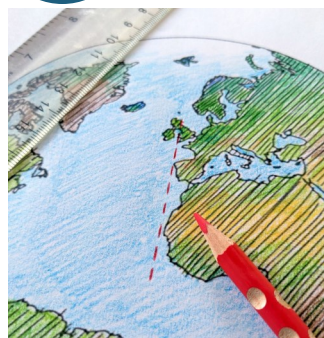
- Plain paper or card
- Scissors
- Glue or tape
- Printed Map of World
- Pencils or Pens
- Ruler

1



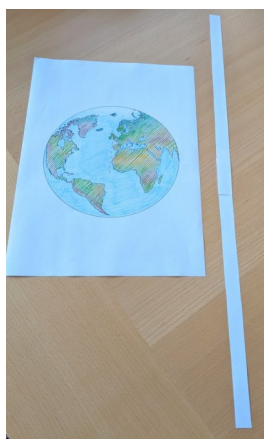
Print off and colour the template map on page X or draw your own map on a blank piece of paper. A4 size works well. Remember to include Scotland and Africa on your map.

2



Once you have finishing drawing or colouring your map, mark the migration route on it—between Scotland and just off the west coast of Africa, as shown.

3



Cut a long, thin strip of card or paper—longer than your map. You may need to join to two strips together with tape to make it long enough.

4



Cut along the migration route and also cut two slots in line with the route—one at each side of the map. Feed the strip of paper through the slots as shown, so that the ends pop out the front of the map and the centre of the strip is at the back.

**Please always supervise children around scissors.**

# CRAFT

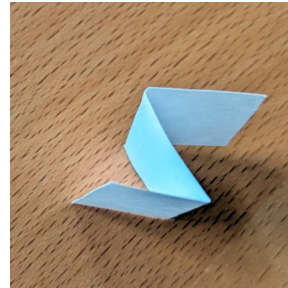
## PULL TAB MIGRATION MAP

5



Draw a gannet on a blank piece of paper or card (or print off a picture) and then cut this out.

6



Attach the cut-out gannet to the sliding strip. To do so, make two folds in a small rectangle of paper to form a Z shape. Slide one end of the Z through the migration route cut and secure the other end to the sliding pull tab. Stick the gannet onto the top end.



Now your gannet is ready to fly along its migration route. You can write 'summer' and 'winter' on either end of the pull tab to indicate which season is spent where. If you have time, why not make another map showing a different animal's migration route?





# QUIZ

## ANSWERS

1	What word is used to describe birds seen outside of their usual range?	<b>Vagrants</b>
2	The formation which geese fly in looks like which letter of the alphabet?	<b>v</b>
3	Which species makes the longest migration of all?	<b>Arctic tern</b>
4	How metres can a humpback whale grow to in length?	<b>17</b>
5	Which unusual bird made a surprise visit to Bass Rock in the 1960s?	<b>Black-browed albatross</b>
6	What term is used for the study of how objects move through the air?	<b>Aerodynamics</b>
7	Which force pushes birds through the air?	<b>Thrust</b>
8	What is the name of the electronic devices attached to animals to detect their movements?	<b>Geolocators</b>



## GLOSSARY

### **BALEEN**

The bony, flexible strips in the upper jaws of whales that feed by filtering food from ocean water .

### **BREEDING**

When an animal finds a mate and produces young.

### **CLIMATE**

The average weather conditions found in a certain place over a long period of time.

### **COURTSHIP**

A set of display behaviours used by an animal when trying to attract a mate.

### **EQUATOR**

The imaginary line around the Earth at equal distance between the north and south poles.

### **HEMISPHERE**

The name commonly used to describe the two halves of the Earth above (north) and below (south) of the equator.

### **HORMONES**

Chemicals produced by the body which send messages to various body parts telling them what to do.

### **MAGNETIC FIELD**

The invisible force field created by a magnet which exists all around it. Planet Earth has an iron core which gives Earth a magnetic field that extends far into space.

### **PREDATION**

When one animal hunts another animal for food.

### **PREDATOR**

An animal that hunts another animal for food.

### **SPAWN**

When aquatic animals lay eggs.