



SSC DIVE IN!

SEABIRD LIFECYCLE



Shag on nest ©
James Glossop



Arctic Tern Chick
© Greg MacVean



Gull eggs (Pixabay)



WELCOME!

Hello, and welcome to the Scottish Seabird Centre “Dive In” Packs of resources providing some seaside fun directly into family homes and classrooms.

This pack’s theme: [Seabird Lifecycle](#)

All animals are born, grow bigger and get older. Most go on to have babies of their own. Eventually every animal reaches the end of its life but the lifecycle goes on for its offspring and for the species as a whole. Birds have their own particular lifecycle stages, involving eggs, nests and becoming ready to fly. For seabirds, this all takes place in the marine environment.

Dive into this pack to discover more about the lifecycle of Scotland’s amazing seabirds.

Inside

- this pack:**
- **Factfile: Lifecycle and Breeding**
 - **Discover: Nests and eggs**
 - **Discover: Seabird chicks**
 - **Craft: Straw painted eggs**
 - **Spotlight: Stages of Guga development**
 - **Experiments: Three eggs-periments**
 - **Blog: Summer for Seabirds**
 - **Glossary**

Look out for FIVE FUN FACTS highlighted in the pack, marked with a light blub. There’s a chance to test yourself on these later in the pack.



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. More resources are available on our [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 education and conservation work. If you enjoy using our resources and would like to support our work, please consider making a donation to our [JustGiving page](#). Thank you.

We hope you enjoy diving in to the pack!

Scottish Seabird Centre Learning Team

FACTFILE

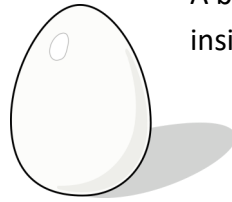
BIRD LIFECYCLE

The lifecycle of a seabird follows the same key stages as any bird lifecycle. From starting out in life as an egg, through hatching and staying in the safety of a nest site, to fledging and becoming independent.

A fully matured adult bird can breed and the female can produce eggs, continuing the lifecycle.

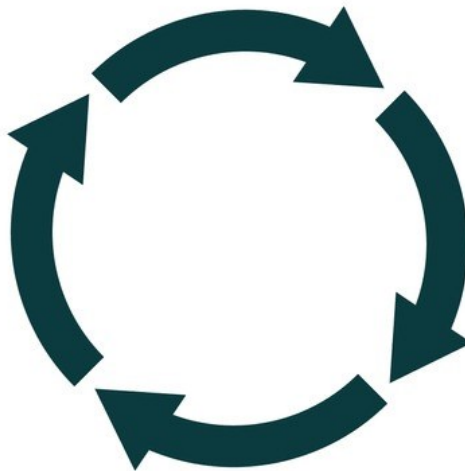


A bird's life begins inside an **egg**.



A chick hatches by breaking free from the eggshell (and is known as a **hatchling**)

The bird begins to live independently as a **juvenile** and eventually will look for a mate.



A chick grows feathers and learns to fly—becoming a **fledgling**.



Chicks stay in the nest, with one or both parents providing food and protection. At this stage the chick is a **nestling**.

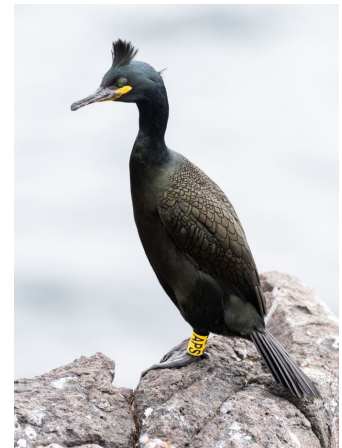
SEABIRD BREEDING

Seabirds are birds that spend most of their time at sea. However, when it is time for them to **breed** and raise their young, they will return to land. Being long-lived, seabirds typically take more years to mature than land birds. Care of their young also tends to last longer than land-living birds, so it is vital for them to choose the right partner to settle with.

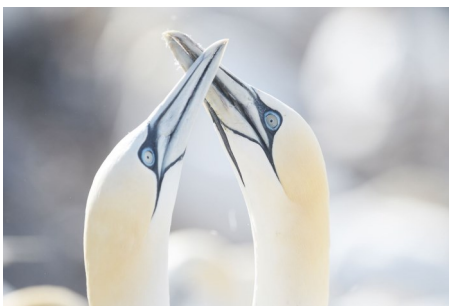
HOW DO SEABIRDS FIND A MATE?

All around the world birds perform amazing **courtship** displays to show their interest in potential mates, as well as to show their strength and fitness. Seabirds are no exception, different species adopt their own **rituals** to attract a new partner or re-establish their bonds after many months apart. During these **rituals**, the male usually begins the **courtship**, and the female watches his displays, song, and appearance to choose the fittest and strongest mate.

Some seabirds have striking **plumage** to help attract a mate, such as the male shag with their black and iridescent green feathers which contrast with bright yellow around their beaks and their tuft of feathers that they can raise or flatten at will. Shags have a fascinating courtship display where they stretch out their necks and point them to the sky.



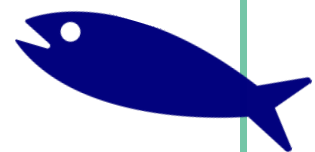
© Jamie McDermaid



© Greg MacVean

Male puffins attract a female, by flicking their heads and grunting near a nesting burrow. Once paired, they affirm their bond by rubbing their bills together. This display usually will draw a crowd of puffins to share in the excitement. Gannet pairs relight their spark by “beak fencing”, they will stand together with wings spread and beaks pointing upwards. They then fence and scissor with their beaks rapidly, calling loudly at the same time.

Terns believe that the way to the heart is through food, so their ritual begins with the male offering a fish to the female. The males of some tern species put on impressive aerial displays whilst carrying the fish.





FACTFILE

SEABIRD NESTS

All birds will look for a safe place to lay eggs—somewhere with protection from threats such as **predators** or severe weather conditions. Different species of seabird prefer different environments for raising their young, from ledges on cliffs to underground burrows. The materials they use to line their nests can range from shell fragments to seaweed, sticks to feathers, and even plastic waste which has found its way into the marine environment. Some species use no nesting materials at all, laying eggs on bare rock.



Shag nest © Susan Davies



Gannet with fishing rope nest (Pixabay)



Gannet with seaweed © Greg McVean



Female Eider duck on nest © Susan Davies

Once nests have been made, the female can lay her **fertilised** egg or eggs. The precious eggs must be kept warm until they are ready to hatch. This stage is called the **incubation** period, and the length of incubation varies in time from one species to another. Eggs are kept cosy by the warmth from a parents tummy. Some seabirds pairs take turns to sit on the egg(s) but **the female eider duck only will sit on her eggs. She will remain on the eggs for the whole 4 week incubation period, without eating!**



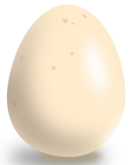
Puffins raise their young (called pufflings) underground. While feeding their chick, puffin parents can be seen coming and going from their burrows, with beaks full of fish. Watch our animation on the lifecycle of a puffin [here](#).



FACTFILE

SEABIRD EGGS

The number of eggs in a seabird **clutch** varies between species to species. Below are several well-known seabird species found in Scotland and the number of eggs that each generally incubates at one time. Some produce a single egg and so only have one mouth to feed. This can be a risky approach, because if something goes wrong with that egg, there will be no offspring at all that season. Those that lay a larger **clutch**, have more chances of breeding success but will need a larger nest and must also work harder to provide for multiple chicks.



1	1-2	2-3	3	3-4
Puffin	Arctic tern	Kittiwake	Herring gull	Cormorant
Gannet			Shag	
Razorbill			Common gull	
Guillemot				



Kittiwake with three chicks © M Roden

The **incubation** period of different seabird species also varies. The Arctic tern has one of the shorter periods of incubation for a seabird, with eggs hatching at 20-24 days. The Northern gannet has a longer incubation period at 42-46 days. Globally, one of the longest incubation periods is that of the wandering albatross at around 85 days. All seabird incubation periods are long, relative to some of our small garden birds. Robin eggs hatch in 12-14 days for example.

The baby bird inside the egg grows and develops during incubation until it is ready to hatch. It will make a tiny hole on the eggs surface with its beak then continue to work to break out of the shell. **Some species, including the Northern gannet, have an “egg tooth” - a tiny sharp cap at the end of its beak that falls off after hatching.**



SEABIRD EGGS—CONTINUED

Did you know, each species of bird produces a different looking egg? Differences include size, shape, colour and pattern. Factors such as species size, shape, internal anatomy, nutritional intake, energy expenditure, lifespan and nesting habitat, all impact the physical features of bird eggs. Guillemots lay their eggs on busy cliff ledges so being speckled helps parents recognise which eggs are theirs. Puffins, on the other hand, lay their eggs in burrows so have relatively plain, white-ish eggs—there's no need for them to be camouflaged if they're hidden underground!

SHAPE

From almost spherical to pointed and asymmetrical, bird egg shape can vary. Guillemot eggs have an almost pear-like shape so that if knocked, they are more likely to spin in a circle rather than roll off the cliff ledges on which they are laid.



COLOUR AND PATTERN

From pale blues and greens, to white and cream, to beige and brown, the background egg colours varies. Some eggs are plain while others feature speckles, spots and blotches.



SIZE

Egg size also has variation with Northern gannet eggs averaging 78mm in length, Atlantic puffin eggs are around 61mm long, while Arctic tern eggs are smaller at around 41mm (source BTO).

The eggs in these pictures were donated to the Scottish Seabird Centre and were collected a very long time ago. We have permission from NatureScot to display them. It has been illegal to take bird eggs since the introduction of the Protection of Birds Act 1954.

DISCOVER

SEABIRD CHICKS

Seabird chicks often look very different from their parents. Adults and their young can be different in colour and pattern, as well as size. Chicks tend to be better **camouflaged** so that they are less vulnerable to **predators**. Look at the images below. Which blend in better with their surroundings—the adults or the chicks?



Razorbill and chick © Greg McVean



Lesser black backed gull chicks © Greg McVean

The razorbill chick on the left is light in colour, like the ledge upon which it nests. The gull chicks on the right are grey and speckled like the rocks they live on, making them blend in while still unable to fly and at risk from predators. Being fluffy and downy is another difference that chicks have from their feathery parents. Energy is put first into growth and only later into the development of flight feathers. Warm downy fluff keeps chicks warm until they are big and strong enough to be ready to fledge.



Spot the Arctic tern chick being fed © Greg McVean

For certain seabird species, the appearance of the chicks changes during the time between **hatching** and **fledging**. The next few pages put the spotlight on gannet chicks—known as gugas—and shows how they change in appearance over the weeks after hatching.



SPOTLIGHT

STAGES OF GUGA DEVELOPMENT

From hatching to fledging, gannet chicks change a lot in appearance over the first weeks of life. Over this page and the next page, a series of drawings show each key stage in their transformation.

WEEK 1



Newly hatched gannet chicks have no obvious plumage, so you can see their grey wrinkled skin. They appear naked and grey.

WEEK 2



The guga is partly-covered with down and is now larger than their parents feet.

WEEK 3



Becoming larger and fluffier—a layer of soft white down covers the chick's head, neck and body.

WEEK 5-6



Approaching adult size. First feathers beginning to push through the down at wings and tail.

All artwork © Emma Marriott

SPOTLIGHT

STAGES OF GUGA DEVELOPMENT CONTINUED

As guga grow they continue to look quite different from their parents. Gannets are very territorial birds and refuse to get along with anyone who isn't their mate. To avoid being mistaken for another adult gannet, attempting to attack or invade the nest site, guga feathers grow in much darker.

WEEK 7



The guga now has a rather patchy appearance over its body but long white down remains on head and neck.

Increasing areas of black feathers appear, especially along the guga's back.

WEEK 8



Scruffier appearance with some fluff remaining on flanks, belly and neck.

WEEK 9



WEEK 10



Very little down left and the guga is almost completely dark in colour.

WEEK 11



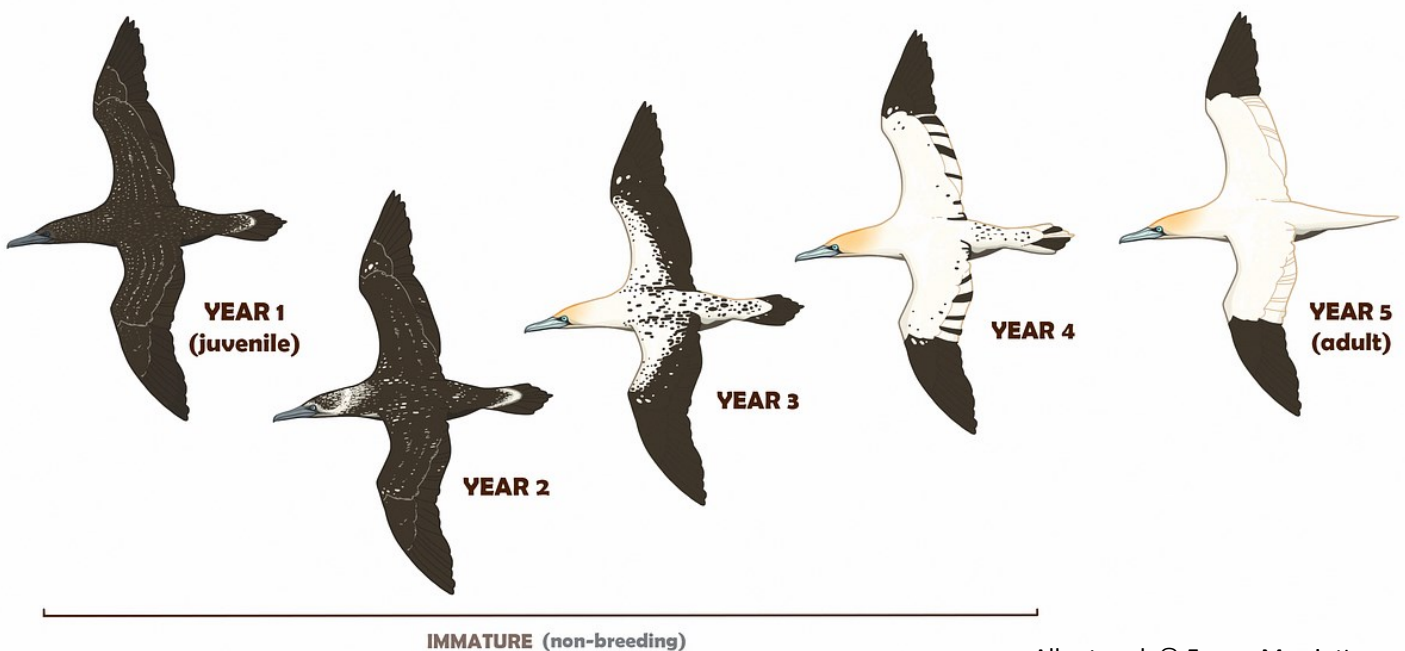
The guga now looks much like its parents but with a dark beak and feathers with speckling.

All artwork © Emma Marriott

SPOTLIGHT

STAGES OF GANNET MATURITY

Juvenile gannets look different from fully matured adult gannets for the first four years of their lives. As the illustration below shows, each year brings a slight change in how the young gannet looks. From being very dark feathered in its first year, lighter feathers begin to come in during year 2. By year 3, the gannet has a more speckled black and white appearance, with far fewer dark feathers by year 4. An adult gannet is a striking combination of yellow head, white body and black wing tips. When a gannet reaches this stage it is mature enough to **breed**.



All artwork © Emma Marriott



Gannet and Guga © Maggie Sheddan

Watch our short animation of the lifecycle of the Northern gannet on our YouTube channel [here](#).



SPOTLIGHT

PUFFLING RESCUE

Every summer during July and August, the Scottish Seabird Centre ask residents along the East Lothian and Fife coast to help the endangered puffin population by looking out for young puffins (pufflings). Pufflings fledge at night. As they begin to leave their burrows on the islands in the Firth of Forth (including the Isle of May which is Scotland's largest east coast puffin colony), some pufflings can become disorientated by lights on the mainland and may fly towards towns rather than out to sea. Once on land they will seek somewhere dark to hide from predators, often underneath cars, behind bins and under plants in gardens.

**If you spot a puffling,
please alert the
Scottish SPCA on
03000 999 999 or the
Scottish Seabird
Centre on 01620
890202.**



Read about the latest Isle of May puffin count on the Isle of May Nature Reserve blog [here](#). Numbers are up to 52,000 pairs.



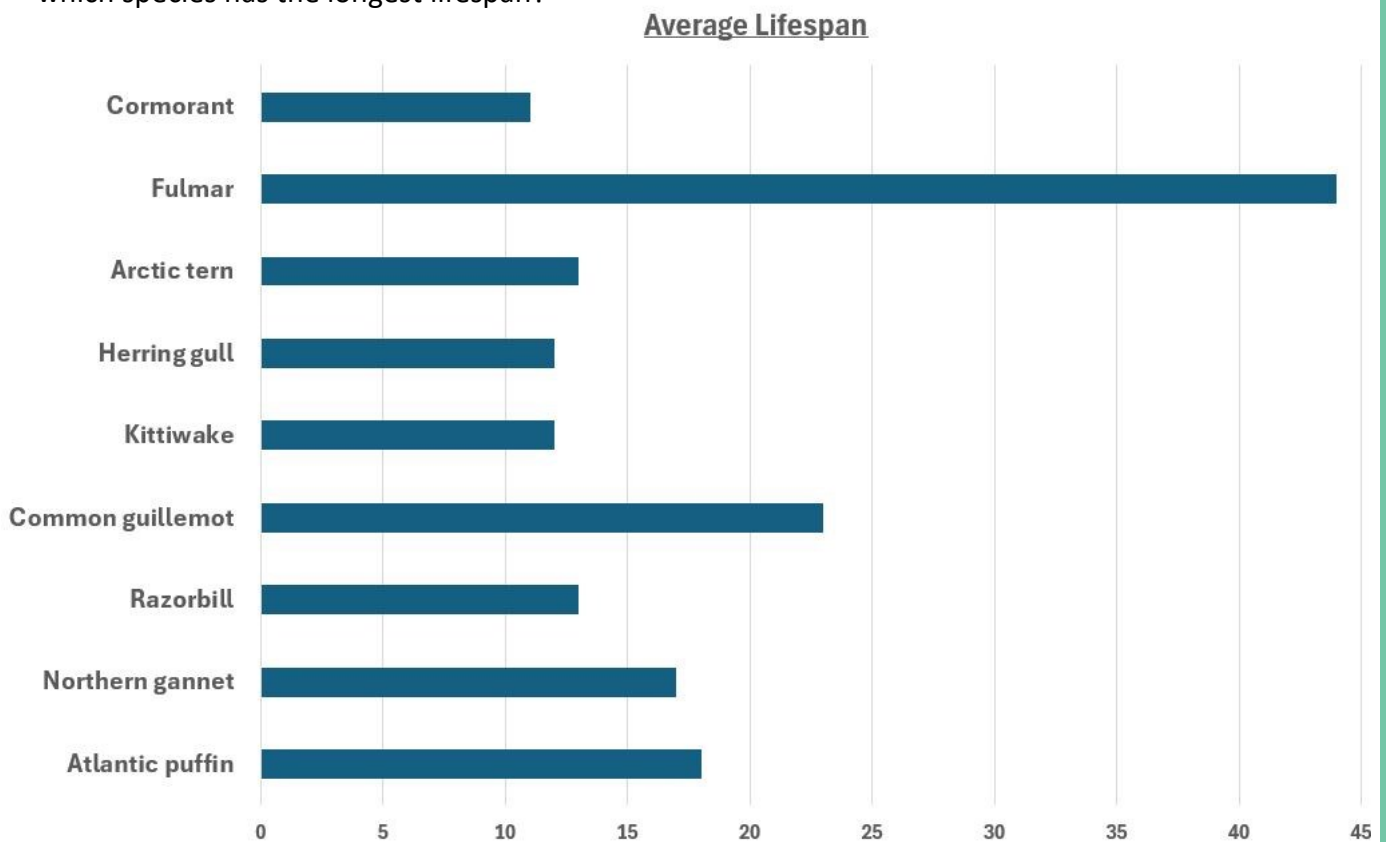
It is important to note that pufflings look completely different from their adult counterparts. People often don't realise what they can see is a puffling. They are shades of grey, white and black; their smaller beaks don't have the characteristic bright colours that the adults have in summer.

The puffin (like many of our breeding seabirds) is **red-listed** by the International Union for Conservation of Nature (IUCN) as it is globally vulnerable and declining in numbers. By reporting any unusual sightings of the small grey chicks (see picture above) to the Scottish SPCA residents and visitors can play a vital role in helping this much-loved seabird. Once reported, the team from the Scottish SPCA (and if local the Scottish Seabird Centre) can collect the pufflings and release them back to sea, away from known predators.

SEABIRD LIFESPAN

HOW LONG DO SEABIRDS LIVE?

In general the lifespan of seabirds is much longer than birds that live on land. While the average lifespan of a robin is just 2 years and a house sparrow 3 years, seabirds can live for decades. The chart below shows the average lifespan of some of Scotland's best known seabirds. Can you spot which species has the longest lifespan?



The Fulmar, with its distinctive tube-like ridge on its beak, can live for more than four decades. Read a news article [here](#) from BTO about the oldest recorded Fulmar. This is far longer than the other seabird species listed above, that typically live between 10 and 20 years. **The oldest known seabird was an albatross named Wisdom that was estimated to be 73 years old!** You can read more about her [here](#). To learn more about some of the seabird species listed in the chart above, see our [Seabirds Dive In pack](#).





BLOG

SUMMER IS NO HOLIDAY FOR SEABIRDS

Every year, **24 species** of seabird flap, swoop and soar their way to Scotland's islands, cliffs and beaches. Some of them will have migrated thousands of miles from warmer climates, like the coast of Africa, where they go to avoid the cold and stormy Scottish winters. Others, like puffins, spend winter way out in the North Sea and might not have touched land since last summer! Yet no matter where they came from, these spectacular seabirds are now in Scotland with one mission: to breed, feed and raise their young.



Guillemots on Isle of May © M Roden

Most seabirds are solitary in winter but—during summer—thousands will cram themselves onto cliff-faces, wedge themselves into wave-worn crevices and hunker down in grassy nooks to nest. It can be difficult to find a space, but each species has its own special tactic so that every available space can be utilised. Razorbills and Kittiwakes nest on sheer cliffs, sometimes on rocky shelves barely any wider than their own bodies. Shags and cormorants favour the wider, sea-splashed lower ledges. Puffins scoop out burrows in the crumbly soil of flatter slopes, where female Eider ducks will also flatten themselves into shallow dips in sheltered corners.



Image from Pixabay

These nesting habits can also offer protection. Steep cliffs are unclimbable for many predators, and burrows provide a secure hidey-hole for defenceless pufflings (baby puffins) that larger predators like gulls can't squeeze into.



BLOG

SUMMER IS NO HOLIDAY FOR SEABIRDS



Female Eider duck on nest (Pixabay)

Other species rely on additional tactics to protect their precious young. Eider ducks rely on **camouflage** to trick **predators**. The females are mottled brown and sit on their eggs until they hatch, blending in perfectly with the rocks, bare soil and coarse vegetation. In fact, they blend in so well and stay so still that you might have walked within a footstep of one without knowing it!

Sharply pointed Arctic terns will swoop and stab at trespassers. Meanwhile, Fulmar adults and chicks will spit a sticky, smelly oil over any intruder who gets too close. It's usually a successful tactic, as nobody wants a face-full of bird vomit!



Arctic tern © Greg McVean



Puffins with beaks full of fish © Susan Davies

By June, Scotland's coasts and islands will be buzzing with the boisterous begging of hungry chicks. With only a month or two until they fledge and begin fending for themselves, seabird chicks must grow large and strong quickly. To succeed, they rely on their parents bringing them a steady stream of food—and lots of it! Pufflings might gobble as many as 100 fish every day. Gannet chicks (gugas) stay in the nest for longer—about 13 weeks—guzzling fish until they're eight times their initial size and even bigger than their parents! In fact, **they've put on so much weight that they can't fully fly for a week or two after gliding from the nest.**





BLOG

SUMMER IS NO HOLIDAY FOR SEABIRDS

Razorbills and Guillemots are also unable to fly upon fledging—but neither can they glide very well! Instead, they flutter their wings as best they can after leaping (and plummeting) from the dizzyingly high ledges where they were born. For the next several weeks, their devoted fathers continue to care for them at sea until they're ready to become independent.

For most seabirds, however, fledging marks the end of a chick's familial bond with its parents. It might be many years before it returns to breed as an adult, sometimes even at the same colony or nest site where it was born. For their parents, it means the end of another busy summer by the coast. There's no such thing as a seabird summer holiday!



Gannet colony on Bass Rock in summer © Jamie McDermaid

JUPLINGS—WHEN GUILLEMOT AND RAZORBILL CHICKS FLEDGE

Guillemot chicks are raised by both parents until around 20 days after hatching when they are ready to **fledge**. At this point the father calls the chick down to the sea, which can be a drop of 100 metres. **The youngster does not yet have its flight feathers and so must jump, rather than fly or glide. It's a dramatic strategy which demands bravery but it works.** Once on the sea, the 'jumpling' will grow its feathers and eventually become independent.

To watch a short film about guillemot chicks making their brave leaps into the sea from their clifftop nests, click [here](#).





CRAFT

SEABIRD EGG PAINTING

Seabird eggs come in a range of shapes, sizes, colours and patterns. In this craft you can use different painting techniques to create the eggs of your own choice and even make a nest for them to sit in.



WHAT DO I NEED?

- White card
- Scissors
- Paints and palette
- Paint brushes
- Reference images
- Pencil
- Jar of water
- A paper straw

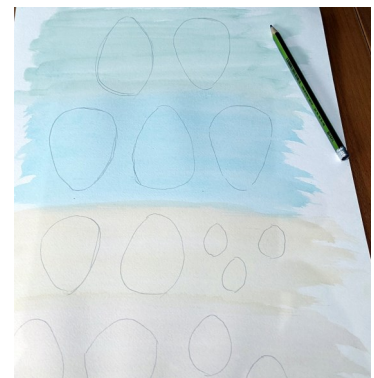
1

Begin by painting your background egg colour onto some white card. It is best to use a watered down colour like a pale blue, green or beige.



2

Allow to dry then draw some egg shapes using pencil onto your background colour.



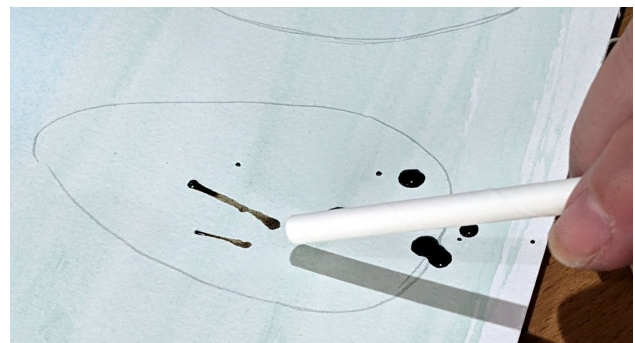
3

Next make a dark yet watery paint which will be the markings or pattern on your egg. Place some droplets of this paint onto your background colour.



4

Take your straw. With the straw end about a centimetre away from the paint drop, blow the droplet across the paper to make a random pattern.



CRAFT

SEABIRD EGG PAINTING

5

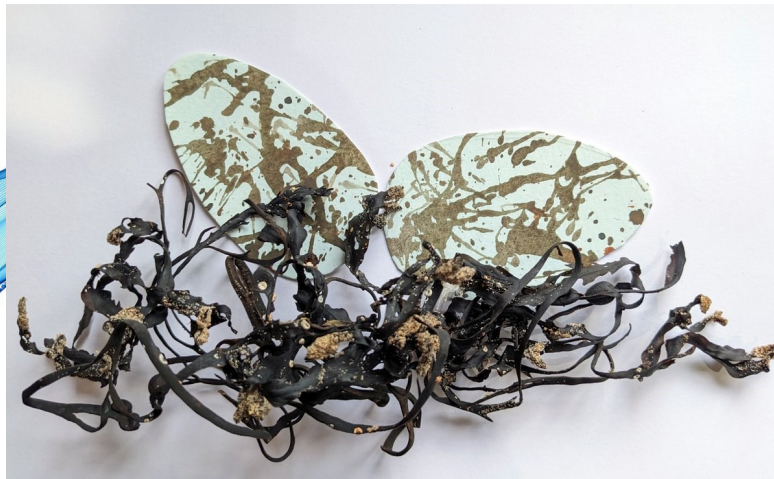


Once you have finished making the egg pattern, allow to dry, then cut out your egg or eggs.

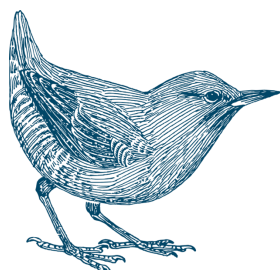
6



You can make a variety of egg sizes, shapes, colours and patterns. As well as blowing paint drops, you could try flicking paint from the brush onto the card to make a speckled or mottled pattern.



To complete your craft, make a nest or backdrop for your egg or eggs. We used some dried seaweed for our seabird eggs. You could also use some twigs and moss to make a nest fit for a garden bird instead.





EGGS – PERIMENT NO. 1

HOW DO RAW EGGS REACT WITH DIFFERENT LIQUIDS?

Materials:

- 4 raw (uncooked) eggs
- 4 large cups or glasses
- Milk
- Water
- Vinegar
- Tomato juice
- Paper towels or plates
- Table covers



Step 1: Carefully place the eggs into the glasses – take care not to break them!

Step 2: Pour in milk until the egg is covered. Look carefully – do you notice anything?

Step 3: Repeat this process with the remaining eggs and liquids.

Step 4: Leave the eggs in their liquid overnight.

Step 5: Next day, carefully remove the eggs and place each on a paper towel. What do you notice?

Step 6: Make sure your table/area is fully covered and protected!

Step 7: Try dropping the eggs. What happens?



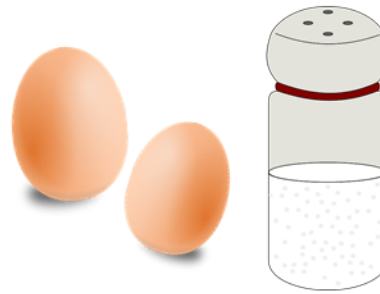


EGGS – PERIMENT NO. 2

CAN YOU MAKE AN EGG MOVE WITHOUT TOUCHING IT?

Materials:

- 2 hard boiled eggs
- 2 large cups or glasses
- Salt
- Stirrer
- Spoon
- Water



Step 1: Carefully place the eggs into the glasses – take care not to break them!

Step 2: Pour in water until the eggs are covered. Look carefully – do you notice anything?

Step 3: Now, add a spoonful of salt to one of the cups and stir. Repeat until you notice a change.

Why has this happened?

- In the water, the density of the egg is greater than that of the water. Therefore, the egg sinks.
- In the salt solution, the salt causes the water to become denser than the egg. Therefore, the egg floats.

Challenge!

- Why not try to float a different object? Small plastic toys work well but make sure you ask permission first!
- Rubbish works too! You could investigate which wrappers in your house float or sink. How could this be a problem for marine life?

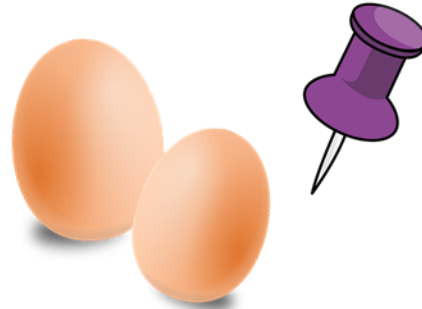


EGGS-PERIMENT NO. 3

SHRINKING & SQUIRTING EGGS

Materials:

- 2 eggs
- Vinegar
- Strong sugar solution
- Water
- 2 cups or large glasses
- Pin



Step 1: Carefully place the eggs into the glasses – take care not to break them!

Step 2: Pour in vinegar until the eggs are covered. Leave for at least 24 hours.

Step 3: Now, remove the eggs from the vinegar. What has happened to their shells?

Step 4: Place one egg in water and the other in the sugar solution, leave overnight.

Step 5: Your eggs should look quite different now. Carefully, put a pin into the larger egg. What happens?

Why has this happened?

Osmosis – the movement of water through a semipermeable membrane. The egg in the sugar solution has lost water, while the egg in water has gained more water!



TEST YOURSELF

CAN YOU REMEMBER THE FIVE FUN FACTS?

1	What age did the longest living seabird reach?
2	What special temporary feature does a gannet have to help it to hatch?
3	What term is used to describe a fledging guillemot chick?
4	How many weeks does a female Eider duck stay on the nest without eating?
5	After a guga fledges, how long is it before it can actually fly?

Check back in the pack for the answers—look for the light bulbs.



DISCOVER

GLOSSARY

BREEDING

Breeding is when plants or animals produce offspring (young).

CAMOUFLAGE

When animals conceal themselves by blending into their surroundings, either by the pattern, colour or texture of their skin, or the use of materials around them.

CLUTCH

A clutch is the total eggs a bird lays per each nesting attempt.

COURTSHIP

The behaviour of male birds, and other animals, aimed at attracting a mate.

FERTILISED

When an egg or seed starts to develop into a new young animal or plant having been joined with a male cell.

FLEDGE

When a bird is mature enough to fly independently.

FLEDGLING

A bird that has recently fledged.

HATCHLING

A young animal that has recently emerged from its egg.

INCUBATION

The process in which a bird keeps its eggs warm until the young hatch out.

JUVENILE

An animal that has not yet reached its adult form or size.

NESTLING

A bird that is too young to leave the nest.

PLUMAGE

The feathery covering of a bird.

PREDATOR

An animal that hunts another animal for food.

RITUAL

Patterns of behaviour that animals use to communicate their intentions— for example towards a possible mate.