



SSC DIVE IN! CITIZEN SCIENCE





WELCOME!

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

This pack’s theme: **Citizen Science**

As the holidays get under way, it’s a great time to try out some ‘citizen science’. But what actually is citizen science? Who can be a citizen scientist? How would you go about giving it a try? Answers to those questions revealed, plus fun activities inside!

Inside this pack:

- **Introduction**
- **Citizen Science Guide**
- **Marine Citizen Science Projects**
- **Activity: Word Scramble**
- **How to: Do a nurdle hunt**
- **Challenge: Test your spotting skills**
- **Information: SSC Certification scheme**

Important note: *If you are going outdoors, please follow the social distancing protocols and government advice.*

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. You may even be rewarded with a certificate (see details inside). More resources 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



INTRODUCTION

ANYONE, ANYWHERE CAN BE A SCIENTIST

A scientist is someone who **gathers** information and uses it to gain knowledge and share it. By making **observations** and asking questions we can find out new information about the world around us. You don't have to have a qualification or a job in science to be a scientist. If you are curious about what things are and how things work, you can be a scientist right now.



THERE ARE MANY QUESTIONS YET TO BE ANSWERED

Although many things about the world are understood, there is so much more left to be fully discovered and explained. Did you know that less than 15% of all the species believed to exist on Earth have been described? Or that we know more about the surface of Mars than we do about Earth's ocean floor? With so much still to **investigate**, it is not surprising that more and more people are being asked to help gather data on lots of different topics.

CITIZEN SCIENCE HELPS WITH SCIENTIFIC ADVANCEMENT

This activity pack is going to tell you all about 'citizen science' and how anyone, anywhere can **contribute** to a wide range of projects. So, read on to learn more about what citizen science is, why you should get involved and what type of projects need your help.



IF YOU LIKE TO EXPLORE, COLLECT, COUNT, OBSERVE, MEASURE OR INVESTIGATE – CITIZEN SCIENCE COULD BE FOR YOU! WHY NOT GIVE IT A TRY THIS SUMMER.



CITIZEN SCIENCE GUIDE

WHAT IS CITIZEN SCIENCE?

Citizen science is when volunteers help to gather, sort and **analyse** data that professional scientists cannot do on their own.



WHAT TYPE OF SCIENCE CAN BE DONE?

All sorts! Researchers in any field of science can include volunteers in their work. Citizen scientists are currently being used in medical science, climate science, biology, physics, and many other subjects.

Some projects get volunteers to **survey** and **collect** their own results, e.g. by taking photos, **measure** or **count** things around them, whilst others ask volunteers to **review** results already collected by scientists.



HOW IS CITIZEN SCIENCE BEING USED TO HELP NATURE?

Repeatedly recording the number and location of species helps us understand how life on Earth is connected and how it changes over time. It's especially important we collect this evidence now because human activities, such as burning fossil fuels and clearing land, are leading to big changes in the natural world.

The more we **monitor** species (watch and assess their progress), the more we'll be able to keep an eye on what is happening and help protect species in the future.

Citizen scientists all around the world are helping **collect** species records - information about the location, number and health of different species. When that data is submitted to local and national projects, it is reviewed by professional scientists and helps them to study how our wildlife and environment is changing and to explore the reasons for this. Scientists and environmental organisations then **report** their findings to the government, which informs decisions on how best to manage the environment.

Species records collected by citizen scientists have helped monitor the spread of invasive species (species introduced to our country from different parts of the world), breeding times of birds, the changing seasons, and migration routes of animals.



CITIZEN SCIENCE GUIDE

WHAT EQUIPMENT DO I NEED TO RECORD WILDLIFE?

1 Getting started is easy. You just need a notepad, pen or pencil to record what you see and where.

An ID guide can also be helpful. We have made some 'Spotter Sheets' to help identify marine and coastal species. You can download them from our website [here](#).



2



As your curiosity deepens you may find some additional equipment helpful.

Items such as a net, jar, magnifying glass, stopwatch and camera/phone to look at what you are seeing more closely and to **record** and upload images of these.

3

When you start to explore in more depth, or further afield, you may require more specialist equipment such as a monitoring grid, binoculars, telescope or microscope.

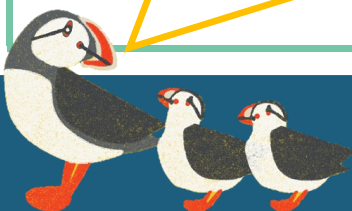
A good way to get access to more specialist equipment is to join a local wildlife club who will have equipment to share or loan out.



BEST PRACTICE: Being a citizen scientist is great fun but remember our coastal and marine habitats and the wildlife in them are sensitive to disturbance. Please follow the [Scottish Outdoor Access Code](#), the [Scottish Marine Wildlife Watching Code](#), and take care not to disturb any animals or plants.

WHY SHOULD I GET INVOLVED?

You don't need particular specialist knowledge or skill to be a citizen scientist. It's a great way to get outdoors, to let your curiosity help you **explore** and learn more about wildlife. Whether you have a few minutes, or a few hours, to spare your data will make a valuable contribution to improving knowledge and understanding.



CITIZEN SCIENCE GUIDE

WHAT CITIZEN SCIENCE PROJECTS CAN I GET INVOLVED IN AT HOME?

It's really easy to get started with citizen science projects by spotting what you see from your own window, garden or local park. **BIRDS** are regular visitors to green spaces and relatively easy to spot, making them good for citizen science beginners. The [RSPB Big Garden Birdwatch](#) or the [BTO Garden Birdwatch](#) involves you keeping track of the birds that visit your garden over one weekend or every week. Record which birds you see, how many and whether they are feeding or nesting. Take a look at our [Beginner's Guide to Birdwatching](#) for some top tips on how to get started.



You could also record the **BUTTERFLIES** that you spot around your garden or local green spaces. You can **participate** in the broader citizen science effort to learn more about these animals by joining in Butterfly Conservation's [Garden Butterfly Survey](#). The more data the butterfly experts have to analyse the more they can target conservation action to help these often striking pollinators to thrive.

ARE THERE MARINE CITIZEN SCIENCE PROJECTS I CAN GET INVOLVED IN?

Exploring the wildlife along our coastal and marine habitats can be particularly rewarding. There's also a big need to **contribute** more data from these environments as they are often less well recorded than our land and freshwater habitats. There are plenty of projects to choose from. Go to the next few pages to find out more..

HINT: HEADING TO A ROCKY SHORE IS A GOOD PLACE TO START

There's lots of different species that live on [rocky shores](#). Have fun learning to identify shoreline plants and animals or have a go at conducting your own **survey**. Search over the shore for a set time or create a 1m monitoring square, called a 'quadrat', by knotting together 4 lengths of string, 1m long into a square. Randomly place the quadrat along the inter-tidal rocks and record what you find taking photos that can help verify your records.



© Rob McDougall



SEASIDE CITIZEN SCIENCE PROJECTS



CETACEANS: Next time you're at the coast why not look out and see if you can spot any cetaceans (dolphins, porpoises or whales). Keep your eyes peeled for fins and flukes (tails) breaking the water and take note of their shape.

You can submit your casual observational data to the Whale and Dolphin Conservation Society's [Shorewatch](#) recording scheme or [Sea Watch Foundation](#)'s website.

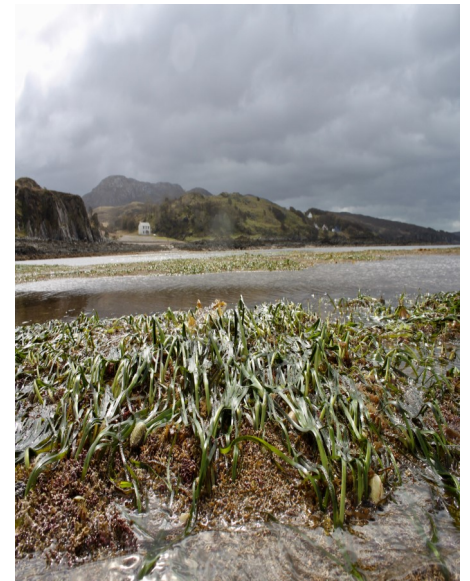


DID YOU KNOW? That scientists can identify individual dolphins from the nicks, notches, tooth rakes and other natural marks on their dorsal fins? Find out more at [Citizen Fins](#) which is run by researchers at the University of St Andrews. Learn more whale, dolphin and porpoise fun facts in our [SSC Dive In! Cetaceans](#) pack.



SEAWEEDS & PLANTS: Seaweed, or '[algae](#)', are important parts of the marine environment—they provide animals with food and shelter, and also capture carbon from the atmosphere. Search and record species with the help of the [Big Seaweed Search](#) run by the [Natural History Museum](#).

[Seagrasses](#) are flowering plants that live in shallow sheltered areas along our coast. These habitats create the right conditions for a range of wildlife to live in and lock up carbon so help mitigate the effects of climate change. You can help us find out more about these habitats by joining in the [Seagrass Spotter](#) which is run by [Project Seagrass](#). Take photos and submit your records.



CRABS: One of our best known and well-loved inhabitants of the rocky shore, crabs can be found hiding under rocks, seaweed and in rockpools at low tide. Identify and record any you find through the [Crab Watch](#) project run by the [Marine Biological Association](#). Remember, crabs can pinch so be sure to read the guidance on how to correctly pick them up before handling them!



MORE PROJECTS LISTED ON THE NEXT PAGE..



MARINE CITIZEN SCIENCE PROJECTS

CALLING ALL MARINE SCIENCE ENTHUSIASTS—THE OCEAN NEEDS YOU!

TAKE PART IN THESE FANTASTIC PROJECTS AND HELP MONITOR OUR SEAS.

OUTDOORS

OPPORTUNITIES TO GRAB YOUR WELLIES, BINOCULARS, CLIPBOARDS AND RECORD SIGHTINGS IN THE FIELD.

[BIG SEAWEED SEARCH](#), NATURAL HISTORY MUSEUM— A project dedicated to the study of algae across the UK

[BIRDTRACK](#), BRITISH TRUST FOR ORNITHOLOGY— Store your bird records online

[BEACHWATCH](#), MARINE CONSERVATION SOCIETY— Help record the extent of litter on UK beaches by conducting surveys each time you do a litter pick.

[CRABWATCH](#), MARINE BIOLOGICAL ASSOCIATION - Record crab sightings to enhance knowledge of their changing distribution

[GREAT EGGCASE HUNT](#), SHARK TRUST— Submit sightings of shark and ray egg cases ('mermaid's purses') on beaches

[GREAT NURDLE HUNT](#), FIDRA – Help document the spread of these small balls of plastic around the country

[JELLY WATCH](#) – Document stranded jellyfish you find on beaches

[SEASEARCH](#) – A project for volunteer scuba divers and snorkellers interested in mapping the sea bed

[SHORESEARCH](#), WILDLIFE TRUSTS— Conduct surveys of the intertidal shore

[WHALE & DOLPHIN WATCH](#), SEA WATCH FOUNDATION – Become a trained whale and dolphin observer

ONLINE

CONTRIBUTE TO FUN AND FASCINATING RESEARCH FROM THE COMFORT OF YOUR OWN HOME.

[The Zooniverse](#) is the world's largest portal of online citizen science projects.

Some marine projects listed include:

[SEABIRD WATCH](#)

[SEAL WATCH](#)

[INVADER-ID](#)

[FISHSTORY](#)

[PLANKTON PORTAL](#)

ACTIVITY



WORD UNSCRAMBLE

Unscramble each of the words below and write your answers in the empty boxes. Each word relates to **Citizen Science**. Clue: All of the words are **verbs** because taking part in citizen science involves taking **action** and **doing** lots of different activities.

1.	beesrov	
2.	atappcertii	
3.	derrco	
4.	orienctbtu	
5.	aeslany	
6.	notuc	
7.	viesetginat	
8.	sarmuee	
9.	ehrtag	
10.	onmitro	
11.	teocllc	
12.	proetr	
13.	veeirw	
14.	ryvuse	
15.	peerxlo	

Most of these words can be found elsewhere in this pack highlighted in **blue**.

You can find the unscrambled answers on page 12.



HOW TO



CARRY OUT A NURDLE HUNT

Nurdles are tiny plastic pellets which are melted and moulded in the manufacture of a huge range of products. However, some of these pellets never make it to the manufacturing process as they are lost in handling or transportation. Significant numbers can end up in the sea and we can see them when they wash up on our beaches. Nurdles don't just make a mess, marine life and seabirds can mistake these pellets for food. The North Berwick charity **Fidra** collects data on nurdles found on beaches.

1.

Visit a beach—ideally a sandy one, rather than a rocky one. Look at the high tide line, among other debris and in any grassy dunes. Can you spot any lentil size plastic like you can see in the photo?



2.

Using gloves (as nurdles can attract toxins) carefully pick up any nurdles you can find. Pop them into a container. Take a note of how long you spend looking.



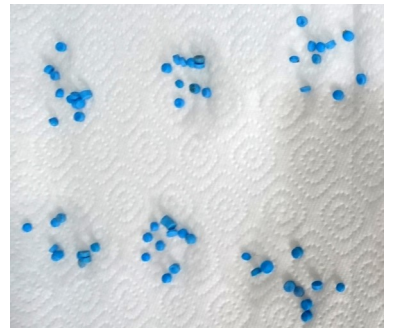
3.

Take your container of nurdles home and given them a good wash in soapy water.



4.

Now count the nurdles. If you have found a lot of them, it might be easier to sort them into groups of ten for easy counting. How many did you find.



5.

Submit your findings [here](#). Remember that a nurdle hunt that finds no nurdles is important information too.



You can find Fidra's [handy nurdle ID sheet here](#) and learn much more about nurdles and the Great Nurdle Hunt [here](#).

CHALLENGE



TEST YOUR SPOTTING SKILLS

Can you spot an **egg case** (also known as a **mermaid's purse**) among the shells in the image below?



Can you find **six jellyfish** on the sand in the image below?



Making **observations**—
looking really closely at the
world around you—is a key
part of being a scientist.



CHALLENGE



TEST YOUR SPOTTING SKILLS

Can you spot **five crabs** hiding in the rock pool below?



Answers to the Word Scramble activity on page 9: 1. OBSERVE; 2. PARTICIPATE; 3. RECORD; 4. CONTRIBUTE; 5. ANALYSE; 6. COUNT; 7. INVESTIGATE; 8. MEASURE; 9. GATHER; 10. MONITOR; 11. COLLECT; 12. REPORT; 13. REVIEW; 14. SURVEY; 15. EXPLORE



WE ARE CELEBRATING THE ACHIEVEMENTS OF YOUNG PEOPLE IN NATURE WITH OUR NEW CERTIFICATE SCHEME!

Are you a young person, or know a young person, who goes above and beyond to **educate** themselves, **inspire** others, or **take action** for the marine environment? Or maybe your class or family have done something together?

We'd love to hear what has been achieved, see photographs of accomplishments and reward them with a certificate! Please contact the team on marineengagement@seabird.org for more information or to apply.



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The Scottish Seabird Centre is conservation and education charity based in North Berwick. Find out more about the charity [HERE](#) or make a donation [HERE](#).

