



GALLOWAY AND SOUTHERN AYRSHIRE BIOSPHERE

SUNDEW
BADGE

OUR UNESCO BIOSPHERE

The Galloway and Southern Ayrshire Biosphere is a region of south west Scotland that has been recognised as a world class environment for people and nature by UNESCO, the United Nations Educational, Scientific & Cultural Organisation.

Covering an area of over 9700 sq km of land and sea, the GSA Biosphere supports a rich biodiversity of plant and animal life, including precious peatland habitats and iconic species such as the red squirrel and black grouse. The UNESCO Biosphere designation represents a collective goal of living in harmony with nature: in Galloway & Southern Ayrshire people have quality natural surroundings in which to live and work, to connect with the land, and to celebrate our cultural heritage.

Very simply – the Biosphere is what we see when we look out the window: our gardens, our school grounds and our communities! Best of all, this part of Scotland is a great place to explore and learn.



UN SUSTAINABLE DEVELOPMENT GOALS



THE DOLPHIN HOUSE



Dolphin House delivers outdoor learning programmes for schools and communities. All activities offered provide a framework for addressing the four capacities within Scotland's Curriculum for Excellence.

Every activity is designed to challenge, inspire, and connect young people with nature. From exciting cliff descents to peaceful paddle sessions, our activities offer something for everyone, no matter the skill level. Young people will explore the outdoors, build new skills, and create unforgettable memories.



www.thedolphinhouse.co.uk

The activities in this booklet support Scotland's Curriculum for Excellence through The Four Capacities:

Successful Learners

With enthusiasm and motivation for learning, determination to reach high standards of achievement, openness to new thinking and ideas.

Confident Individuals

With self-respect, a sense of physical, mental and emotional wellbeing, secure values and belief, ambition.

Responsible Citizens

With respect for others, commitment to participate responsibly in political, economic, social and cultural life.

Effective Contributors

With an enterprising attitude, resilience, self-reliance.

HOW TO ACHIEVE YOUR BADGE

Complete an activity from each of the three topics and then choose an evidencing method:



Send us pictures documenting your activities. For child protection reasons, photographs should not include children's faces.



Email us to tell us about the things you did to complete the activities - info@gsabiosphere.org.uk

Once you have completed your activities and received your badge, make an Environment Pledge. What will you do in future to help the climate and nature?



ACTIVITIES KEY



Many of these activities involve Science, Technology, Engineering and Maths (S.T.E.M.). The MaidSafe Foundation provides further information about S.T.E.M.



This activity works super well in winter too



Work as a group to achieve this activity










Work in teams for this activity










TOPIC 1: IMMERSION IN THE BIOSPHERE









Explore the Biosphere close up using hands-on activities, apps and ID guides to find out more about this amazing place!

ACTIVITIES	WHAT YOU NEED TO DO...
1A. Explore!	<p>Explore your local outdoor area for birds, bugs, plants and anything else!</p> <p>Top tip for leaders – Download the iNaturalist app onto your phone to help with ID. Use a bird song identification app on your phone to ID birds on a walk.</p> 
1B. Try natural materials	<p>Collect blackberries and mush them up to make ink, collect feathers for quills, and use them in an art activity.</p> 
1C. Sounds & Smells	<p>Explore the sounds, smells, tastes and textures of the Biosphere. Invite a foraging expert to visit you or can you collect nettle leaves to make nettle tea?</p> 
1D. Bioblitz! 	<p>Complete a Bioblitz in an outdoor space. How many species can you record in an hour? Use the iNaturalist app to help you.</p>  

ACTIVITIES	WHAT YOU NEED TO DO...
<p>1E. Draw a mega group picture!</p> <p> GROUP ACTIVITY</p> <p></p>	<p>Include forests, mountains and rivers. Now add fish, birds, mammals and people.</p> <p>Extension: add communities, farms, windfarms and forestry and see where nature and people crossover. Are there conflicts here or do nature and people live side by side?</p> <p>Top re-use tip for leaders: Rolls of unwanted wallpaper can be used on the reverse side to make big, colourful hand drawn animal and nature banners.</p>
<p>1F. All life on Earth</p> <p> STEM</p>	<p>All life on Earth relies on healthy and clean fresh water to survive. Choose a river location to conduct an OPAL water survey, guide booklets are easily found online.</p> <p></p>
<p>1G. Birds of prey</p> <p> TEAM CHALLENGE</p>	<p>One of the biggest birds of prey in the Biosphere is the Sea Eagle, making nests that are up to 2m across and 1m deep! Can you make a full-size Sea Eagle nest and how many can fit in it?</p> <p>Works best in wooded areas or beaches.</p> <p>Red kites are another large bird of prey in our area, can you make a kite to fly outside?</p> <p></p>
<p>1H. Life in miniature</p>	<p>Explore the bugs and beasts at the heart of our ecosystems. Go rockpooling to find marine invertebrates, pond dipping to look for water bugs and amphibians, or do a minibeast hunt in a woodland.</p> <p></p>

ACTIVITIES	WHAT YOU NEED TO DO...	
1I. Get wet! 	<p>We have beautiful coastline around our Biosphere, as well as many, many lochs! Can you try a new water sport such as sailing, coasteering, kayaking, canoeing, snorkelling, gorge walking or paddle boarding?</p> <p>Learn about water safety https://colinthe coastguard.com/hm-coastguard/</p>	
1J. Bushcraft 	<p>Use sticks and tarps to build a den in a wooded area, practise firelighting skills or cooking on a campfire!</p>	
1K. Stargazing 	<p>This part of Scotland is a Dark Sky Park. On a dark, clear night go out to a place with no artificial lights. Look at the moon and the stars. What constellations can you see? Do you know any stories about them? Look for shooting stars and if you're lucky, the aurora borealis (Northern Lights).</p>	
1L. Spoonville!	<p>Lots of communities around the world take part in Spoonville. It is a really fun activity that uses decorated wooden spoons to make a mini-village, and easy to find on Google!</p>	
1M. Ancient landscapes 	<p>Become a geologist and investigate the rocks, stones and pebbles on the beach, up a mountain or elsewhere. Maybe you will find the fossil of an ancient creature!</p>	

ACTIVITIES	WHAT YOU NEED TO DO...
1N. History & Heritage	<p>Find a local historical landmark, such as a cave, castle or ancient structure. Research its history and any stories associated with it. Tell the stories to others.</p> 
1O. Stories & myths 	<p>Research some old local stories or myths or better still – make up your own, using local landmarks like a big old tree or a creepy old building. Have an evening (round a campfire if you can) and tell stories about your local area. Or could you act them out?</p> 
1P. Explore the Biosphere map 	<p>Use paper, pens, pins, post-its – whatever you have handy – to add places that you know about or have visited, then add any wildlife you have seen and where, and any historical places you have seen. Share your stories with your group.</p> <p>Note to Leaders: Photocopy the Biosphere map in the centre of this booklet to use for this activity.</p>
1Q. Extracting DNA from a strawberry  	<p>Use soap, salt and alcohol in an experiment to extract DNA from a strawberry! Follow these steps:</p> <ol style="list-style-type: none"> 1. Freeze 50ml rubbing alcohol for 30 minutes 2. Mix 2 tbsp dish soap, 1/3 cup of water and ½ tsp salt together, to create an extraction mixture. 3. Squish one strawberry (no leaves) in a plastic bag 4. Add 3 tbsp of the extraction mixture to the strawberry and squish for another minute 5. Filter it (through coffee filter) into a cup. 6. Pour the alcohol down the inside edge of the cup 7. Use a matchstick to extract the DNA strands which accumulate in the alcohol

ACTIVITIES

WHAT YOU NEED TO DO...

1R. Honeycomb structures

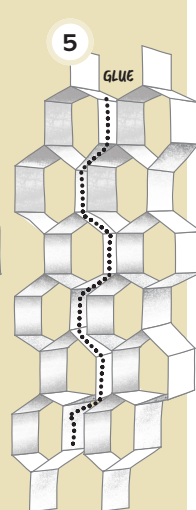
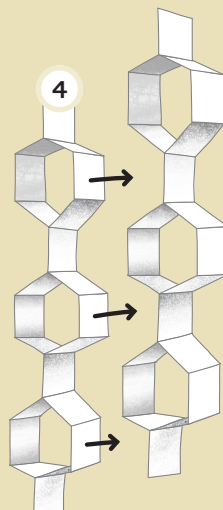
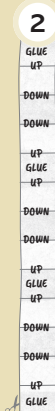
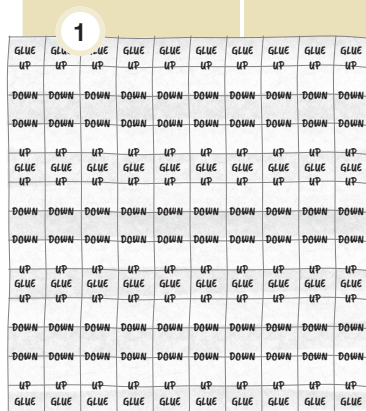


Honeycombs are made up of hexagonal shapes, in 3 dimensions. They are created by bees to form strong structures but are also found in dragonfly wings to help them fly and in the 'pneumatic bones' of many birds, particularly those migrating long distances. Engineers use this structure to create aeroplane wings.

In a team of 3, make your own honeycomb structure using paper.

1. Prepare a sheet of lines 2cm apart and label as below.
2. Cut along the vertical lines to create strips
3. Fold as instructed (up/down)
4. Glue two strips to make one honeycomb section.
5. Glue each honeycomb section together and repeat until all sections are joined.

Hold a competition to see how much each structure can hold before collapsing – add books or weights and see whose team wins!



BIOSPHERE MANAGEMENT ZONES

- BIOSPHERE CORE ZONE
MOUNTAINS AND BLANKET PEAT BOG
- BIOSPHERE BUFFER ZONE
GALLOWAY FOREST PARK AND AGRICULTURAL AREAS
- BIOSPHERE TRANSITION ZONE
COMMUNITIES AND BUSINESSES
- BIOSPHERE MARINE DESIGNATION

HABITAT KEY

-  MOUNTAIN
-  DECIDUOUS FOREST
-  CONIFEROUS FOREST
-  LOCH
-  SALTMARSH
-  SEA CLIFF
-  ROCKY SHORE
-  SEAGRASS



GALLOWAY & SOUTHERN AYRSHIRE UNESCO BIOSPHERE



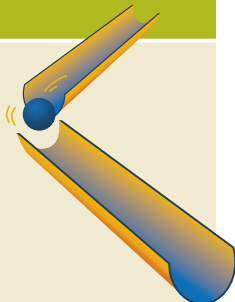











TOPIC 2: SUSTAINABILITY IN THE BIOSPHERE










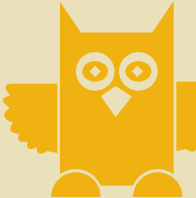







The Sustainable Development Goals were created in 2015 by the United Nations, and 193 countries of the world signed up to work together to help achieve them.

Scotland was one of the very first countries to sign up, and by all of us working towards the goals in our communities, together we will help Scotland achieve them! Check out sdgs.un.org/goals for loads of resources.

ACTIVITIES	WHAT YOU NEED TO DO...
<p>2A. Gutterball</p>  	<p>Divide the group into teams and give each participant one short length of pipe. Challenge each team to deliver a ball down the pipes from a starting point to a finish line. A successful pipeline team building activity requires participating groups to exercise excellent communication, creativity and teamwork.</p> 
<p>2B. 'What to do' relay race</p> 	<p>Print and cut out a range of images of things that we would dispose of: e.g. a crisp packet, an apple core, a plastic bottle, a milk carton, banana peel, etc. Print three signs 'Rubbish', 'Recycle', 'Compost'. Teams need to relay the rubbish into the correct bins!</p> <p>Leaders – once a team has finished doesn't mean they have won – examine their rubbish to check they have correctly placed the items!</p> 

ACTIVITIES	WHAT YOU NEED TO DO...
<p>2C. Solar Energy</p> 	<p>If there are solar panels on your building, record how much energy is being produced by the sun at different times of the day. Top tip for leaders: Invest in some STEM solar power kits to support further exploration of this subject through hands on learning.</p> 
<p>2D. SDG Charades</p>	<p>Print each of the 17 goals on A4. Put them around the room. Play a game where a leader calls out an action or acts it out like charades! The group must run to the goal it meets, e.g. leader acts out reading a book, answer is SDG 4 Quality Education.</p> 
<p>2E. Water Saving</p> 	<p>Look at a water butt and how it works. Use it to water some plants. Explore the top tips from Royal Horticultural Society (rhs.org.uk) to create a rain garden or a rain pond to benefit wildlife and use your rainwater!</p> 
<p>2F. Get GIKI</p>	<p>Create a GIKI account online! It will provide lots of ideas for what we can all do to be more environmentally conscious in our lives. Have a competition to see who has the lowest carbon footprint.</p> 
<p>2G. SDG Eagle eyes</p>	<p>Copy and cut out SDGs – one set per pair. For older groups cut the coloured boxes separately to make it harder! Leader calls the tag line – pairs must find which SDG that is and shout out first, e.g. leader calls ‘Life on Land!’ Answer ‘15!’</p> 



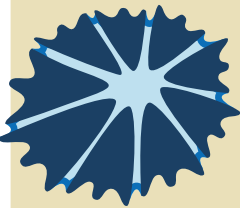
ACTIVITIES	WHAT YOU NEED TO DO...
<p>2H. My footprint</p> 	<p>Ask everyone to place their foot on a piece of paper and draw around it. Inside, write all the resources they used that day – e.g. did they watch tv, use lights or a phone? These all use electricity. Did they use paper? What did they eat? How did they travel? Discuss where things come from and how we could save resources and electricity with small changes.</p>
<p>2I. SDG Snap</p> 	<p>Print and cut-out five sets of the Sustainable Development Goals cards per group and use them to play SNAP!</p> 
<p>2J. The Power of Wind</p> 	<p>Invest in some kids wind turbine kits and use them to explore wind generated power!</p> 
<p>2K. Take action - SDG 13</p> 	<p>Climate Action can include saving energy at home and in school, using our cars less, improving biodiversity in our area (such as planting trees and flowers, bug hotels, bird boxes and litterpick) and much more – as individuals, groups and communities. Brainstorm what you could do together to take Climate Action in homes, schools or community. You may want to choose one of these actions as your Environment Pledge.</p> <p>Extension: Support your young people to follow through on any great, achievable ideas.</p>





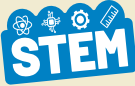
ACTIVITIES	WHAT YOU NEED TO DO...
<p>2L. Recycled art project</p> 	<p>As a team, use a variety of recycled materials to create a sculpture. It could be an animal you have seen, followed by a vote for the most realistic creature! Or create a structure that floats – hold a race or see which one can hold the most weight!</p> 
<p>2M. Micro:bit Step Counter Project</p> 	<p>Use a BBC micro:bit in a project, such as creating a name badge, emotions badge, sunlight sensor, compass bearing, temperature logger, energy cost calculator, animal tracker, species counter or environmental exploration of temperature, sound and light levels.</p> 
<p>2N. Sustainable Superheroes</p>	<p>Create your own sustainable superhero; maybe they save water, plant trees, save energy or are a super-recycler. Draw them and add their super-power! Write a story about them and tell it to others!</p> 
<p>2O. Tides and times</p> 	<p>Put a flag in the sand where the tide is at high tide. As the tide retreats, measure hourly how far out the tide has gone.</p> 
<p>2P. Sand patterns</p> 	<p>On a flat sandy beach, use a stick and a piece of string to create circles of different sizes. Try other shapes and make giant patterns that can be seen from above.</p> 

TOPIC 3: GREEN AND BLUE HEALTH



The terms green health and blue health refer to activities that we can enjoy in the outdoors that benefit our physical and mental health & well-being. There are lots of opportunities to engage with green health in the Biosphere - woodland walks, hiking and outdoor games; and blue health, such as kayaking and other water activities

ACTIVITIES	WHAT YOU NEED TO DO...
3A. Wilderness Explorers 	The Galloway Forest and the wider Biosphere region are both fantastic walking areas. Complete a hill walk, using a map to find your way, or go orienteering. Explore somewhere new; go caving, mountain biking or abseiling.
3B. Night Walk 	Explore nature at night. Go for a walk, listen to the sounds of nature, turn your torch off and let your eyes adjust to the dark. How much can you see? Wear night vision goggles to see what animals are lurking in the undergrowth! Use bat detectors to hear these small mammals flying around you in the dark.
3C. Limpet Game 	Limpets are a mollusc that stick themselves to a rock with a kind of natural glue at low tide to protect them from predators like sea birds. When the tide comes in and they are covered by water, they move around, feeding off algae on the rocks. To play the game: Each child finds a spot on the sand and draws a circle which they stand in. Two people are gulls. At 'High tide' limpets venture out to find food (run around), but when the leader shouts 'Tide's Out!' they have to run back to their spot without being caught by a gull. If they are tagged they become a gull.

ACTIVITIES	WHAT YOU NEED TO DO...
<p>3D. Echolocation Game</p> 	<p>Dolphins and whales use echolocation to communicate through the ocean. Pupils stand in a circle. Choose a dolphin and a mackerel, who stand inside the circle. Blindfold the dolphin. To echolocate, the dolphin says out loud ‘dolphin’ and the mackerel must reply with ‘mackerel’. The dolphin has to try and catch (tag) the mackerel using just the sound of the reply, while the mackerel must evade capture. After a while the circle closes in. An extension is to add more mackerel into the circle.</p>
<p>3E. Ninja Stars</p> 	<p>Make five ninja stars out of sticks lashed securely together, and mark target blocks with scores from 5 to 100.</p> <p>Place the most valuable targets progressively further away. One person throws at a time and everyone else stands safely behind the thrower! Highest score wins!</p>
<p>3F. Curling</p> 	<p>The island of Ailsa Craig is a volcanic plug from an extinct volcano and is composed of two types of quartz-free granite rock; blue hone and granite green, which are used for curling stones. Curling ponds used to be found all over Scotland in the Victorian Era, however with the warming weather due to climate change, the water does not freeze hard enough to play outside any more. Invest in an indoor curling board for rainy day fun!</p>
<p>3G. Make natural decorations</p>	<p>Make natural decorations like leaf garlands or hanging mobiles. Use the technique of Hapa-zome (leaf bashing!) to make bunting.</p> 
<p>3H. Eat the rainbow</p> 	<p>Plants produce phytonutrients to protect themselves from diseases, and by eating the plants we are also protected! Red for the heart, orange for the eyes, purple for the brain, white and brown for immunity, green for the whole body! Plant and grow some vegetable and herb seeds which cover the rainbow, such as tomatoes, potatoes, carrots, beetroot, spinach and basil. Make a delicious rainbow salad or soup to eat!</p>

BIOSPHERE QUIZ



Take on the Biosphere Quiz. Play as a traditional quiz with paper and pens, or in a larger space place large A, B, C, and D in each corner and call out questions; group runs to what they guess could be the correct answer. Make as many questions to suit your group as you like. Throw in some curveballs like we have!

1. WHAT IS A BIOSPHERE?

A. AN AREA OF SPACE

B. AN AREA WHERE PEOPLE DON'T HAVE CARS

C. AN AREA OF WOODLAND

D. AN AREA THAT HAS SPECIAL LANDSCAPES AND WILDLIFE

2. WHICH OF THESE PLACES IS IN THE CORE OF THE BIOSPHERE?

A. SILVER FLOWE

B. STINCHAR VALLEY

C. CULZEAN CASTLE

D. NEW CUMNOCK

3. WHICH OF THESE TYPES OF BIRD LIVE IN THIS BIOSPHERE?

A. EMU

B. HARRY EAGLE

C. OSPREY

D. RED DEER



4. HOW MANY RIVER CATCHMENTS IS THE BIOSPHERE BOUNDARY BASED ON?

A. 3

B. 4

C. 7

D. 8

5. THE GSA BIOSPHERE IS A GREAT PLACE TO CYCLE. IF CYCLING FROM GATEHOUSE OF FLEET TO AYR, WHICH CYCLE ROUTE WOULD YOU FOLLOW? GUESS!

A. CYCLE ROUTE 4

B. CYCLE ROUTE 5

C. CYCLE ROUTE 6

D. CYCLE ROUTE 7

6. WHICH OF THESE MARINE MAMMALS IS NOT FOUND IN THE GSA BIOSPHERE?

A. GREY SEAL

B. BOTTLE NOSED DOLPHIN

C. HARBOUR PORPOISE

D. DUGONG

7. HOW BIG IS THE GALLOWAY & SOUTHERN AYRSHIRE BIOSPHERE?

A. 5200 SQ KMS

B. 200 SQ KMS

C. 350 SQ KMS

D. 9700 SQ KMS

8. THE GSA BIOSPHERE HAS AN SDG TRAIL. WHERE IS THE LOCATION OF SDG 13, CLIMATE ACTION?

A. LOCH KEN

B. COLMONELL

C. WIGTOWN BAY

D. HANNAHSTON WOODS

9. WHAT IS THE HIGHEST PEAK (HILL) IN THE BIOSPHERE REGION?

A. CAIRN TABLE

B. THE MERRICK

C. CAIRNSMORE OF CARSPHAIRN

D. CAIRNSMORE OF FLEET





GALLOWAY AND
SOUTHERN AYRSHIRE
BIOSPHERE



The Galloway and Southern Ayrshire Biosphere Partnership worked collaboratively with the Dolphin House outdoor centre to create this achievement badge. We also thank the MaidSafe Foundation for STEM contributions.

TO REQUEST FURTHER INFORMATION
OR CONTACT OUR TEAM, EMAIL

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Galloway & Southern Ayrshire
Biosphere Reserve
since 2012
Man and the Biosphere
Programme