



FSC Outdoor Classroom for Scotland Standard Grade Programmes

FSC programmes are fixed length courses with clearly stated outcomes and links to SQA Arrangements.

Biology:
The Biosphere
5 days

Keen to use real world learning to create **engaged** students?
Want to promote **teamwork** and social skills?
Interested in effectively **challenging** gifted and talented students?
Aim to make A Curriculum for Excellence fun through **memorable** experiences?
Seek **inclusive** experiences that appeal to a range of learners?

Please visit
<http://www.field-studies-council.org/outdoorclassroom/scotland/standardgradebiology.aspx>
for alternative Standard Grade programmes

OVERVIEW

This five day programme focuses on the 'Biosphere' unit of the Arrangements. During the course all students will benefit from expert tuition in a beautiful highland setting, while experiencing *real* biological situations first hand. This is a short course that packs a lot of biology into a limited amount of time; students will leave with a greater understanding of fieldwork and the concepts needed to complete an investigation.

Reward Sessions are included in evening activities to help encourage and motivate students.

PROGRAMME LENGTH

5 Days (4 nights with 12 teaching sessions)

Monday-Friday, Wednesday-Sunday

Groups would normally arrive in time to be taught in the afternoon of the first day and would then be taught on that evening and for three full days subsequently. Groups depart immediately after the morning session on the day of departure.

Day 1	Day 2	Day 3	Day 4	Day 5
Arrive Afternoon & evening sessions	Morning, afternoon & evening sessions	Morning, afternoon & evening sessions	Morning, afternoon & evening sessions	Morning session Depart after Lunch

PROGRAMME CONTENT

Includes:

- Biological sampling methods and fieldwork techniques
- Data collection using a range of fieldwork techniques
- Analysis and presentation of data
- Investigating freshwater and terrestrial ecosystems, processes and dynamics.

ARRANGEMENTS LINKS:

Topic 1: The Biosphere

Sub-Topic a – Investigating an Ecosystem

- 1 Make a preliminary visit to an ecosystem.
- 2 Use appropriate sampling techniques for the ecosystem and organisms studied
- 3 Use simple keys or checklists to identify organisms.
- 4 Identify and make measurements of relevant abiotic factors
- 5 Design and carry out an investigation on the effect of abiotic factors on the distribution of an organism using some of the above techniques.
- 6 Interpret data on the effect of abiotic factors on the distribution of organisms.

Sub-Topic b – How it Works

- 7 View and discuss material illustrating the components of ecosystems to demonstrate that these are common to all ecosystems.
- 9 Construct food chains and webs using information provided on organisms.

Sub-Topic c – Control and Management

- 15 Obtain information on main areas in which pollution occurs and identify the sources.
- 17 Obtain and present information on the pollution of water by organic waste, to include the effect on oxygen levels and numbers of organisms present.

TIMETABLE

DAY	MORNING	AFTERNOON	EVENING
1	<p>Arrival (approx. 12 - 1pm)</p> <p>Welcome and outline the challenges ahead</p> <p>Tour of centre Settle into rooms Allocate kit (i.e. waterproofs)</p>	<p>Introduction to Fieldwork Introductory discussion to explore:</p> <ul style="list-style-type: none"> • The importance of fieldwork in biology • Biological sampling methods and techniques • Aims of the three day course <p>Fieldwork Activities Mini-projects: students work together and carry out a 'mini' investigation; results and procedures are discussed as a whole class</p>	<p>Reward Session: Small Mammal trapping Students will set Longworth traps in order to trap and study small mammal species of the area to:</p> <ul style="list-style-type: none"> • Identify and discuss the ecology of each species • Discuss the control of mammal population through competition for discourse
2	<p>River Pollution study Students undertake river investigation to:</p> <ul style="list-style-type: none"> • Identify components affecting the river ecosystem • Introduce concepts of freshwater ecology • Identify pollution sources • Collect data uses appropriate sampling techniques for both biotic and abiotic factors • Identify water invertebrates using keys • Measure pH and oxygen saturation levels along with river velocity 	<p>Follow up session</p> <ul style="list-style-type: none"> • Use microscopes and keys to identify invertebrates and adaptations to living in water/feeding • Identify ways in which organic pollution can affect the distribution of organisms • Identify sources of error in data collection 	<p>Reward Session: Food Chains Students will design and build own activity to demonstrate food chain/web relationships and energy flow</p> <ul style="list-style-type: none"> • Reinforce learning about energy flow and interrelationships in an ecosystem • Improve their team and communication skills
3	<p>Woodland Ecosystems Students undertake a coniferous and deciduous ecosystem investigation to:</p> <ul style="list-style-type: none"> • Discuss woodland ecosystems and identify those that may be found in Scotland • Use identification keys and focus on diversity and abundance of woodland invertebrates and propose hypotheses • Use appropriate biotic and abiotic sampling methods • Measure and investigate leaf litter, tree beating, soil pH, moisture, light intensity and humidity • Introduce concepts of land management and conflict 	<p>Follow up session Using data gathered during the morning fieldwork investigation students will:</p> <ul style="list-style-type: none"> • Provide graphical analysis of their results • Discuss the methodology used and its limitations 	<p>Reward Session: Nightwatchers Students take part in a night time sensory experience to discover nocturnal life in the centre grounds.</p>

4	<p>Moorland Investigation Student undertake a heather moorland investigation to:</p> <ul style="list-style-type: none"> • Introduce heather moorland ecosystems and how these may change over time • Discuss the management issues of moorland • Identify different aged stands of heather according to heather growth model • Measure biotic and abiotic factors including height of vegetation, species and light levels 	<p>Follow up session Using data collected in the field students will:</p> <ul style="list-style-type: none"> • Provide statistical and/or graphical analysis of their results, including Simpson's diversity index • Discuss the methodology used and its limitations 	<p>Presentations Students will work in small groups to prepare and deliver a short presentation for their peers on their experiences during their visit</p> <p>(Option of Moth trapping to be followed up with moth id on the morning of day 5)</p>
5	<p>Reward session: Ropes and Zip Line Students take part in a series of ropes challenges to:</p> <ul style="list-style-type: none"> • Improve their communication skills • Undertake a personal challenge 	<p>Lunch and Depart</p>	

Please note: to ensure safe and quality learning experiences for students the timetable may alter depending on weather conditions and local factors at centres.

FSC KINDROGAN

Located in rural Perthshire, at the edge of the Cairngorms National Park FSC Kindrogan is 11 miles from Pitlochry's mainline train station and close to the A9. The Centre itself is set in wooded grounds on the banks of the River Ardle and lies within easy reach of some of the most inspiring landforms in the Scottish Highlands and a rich range of wildlife habitats.



KD

Kindrogan

Tel: 01250 870150

TO BOOK THIS PROGRAMME, SIMPLY:

1. Choose the time of the year you would like to attend
2. Check availability online or contact FSC Kindrogan

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for alternative standard Grade programmes

The FSC prides itself on being flexible. If you can't find a programme to meet your exact requirements a course specifically tailored to meet your needs can be developed. To discuss this, contact the centre of your choice. Fees will depend on what time of year you would like to visit and your length of stay but will be more expensive than FSC programmes at peak periods.