

| 16+ | Study Modules | Brief Description | Equipment Includes: | Centre | SQA Higer Arrangements Units Covered |
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| Biology | Agriculture and Conservation | On a walk through mixed farmland, with field lectures discussing the surrounding landscape, students study intensive and extensive food production. Issues include monoculture, pesticide and fertilizer use, field size and hedgerow loss, and their impact on species diversity and loss of stability is considered. The advantages and disadvantages of organic farming are discussed along with the uses of biological pest control and integrated pest management. Information on aquaculture and Lamlash Bay – Britain's first 'No Take Zone' for fishing - can be included. | Activity sheets, digital cameras. | Loch Ranza | SQA Geography Higher: Human Environments Unit (Higher): Topic b) Rural geography Key topics 1, 2. Environmental Interactions Unit (Higher): Interaction (a) –Rural land resources Key topics 2, 3, 4, 5; |
| | Ecological Succession | By performing accurate and detailed line transects students can observe the changes in succession in relation to biotic and abiotic factors. They also begin to appreciate the importance of conservation and management of fragile ecosystems. This unit is ideal for students undertaking projects with an emphasis on experimental design, accurate and consistent data collection, hypothesis testing and statistical analysis | Activity sheets, digital camera, Pocket PC, infiltration kit, pH kit, soil thermometer, moisture meter, profiling kit, quadrat, plant ID guides, Pocket ID books, anemometer. | Barton Hall, Little Canada, Osmington Bay | SQA Biology Higher: Unit 3: Control and Regulation (Higher): 4 Environmental influences: c) Population dynamics. SQA Geography Higher: Physical Environments Unit (Higher): Topic d Biosphere: Key Topic 2. |
| | Ecosystems in the British Isles, Ecological Succession | An introductory session highlights the variety of types of succession which can take place, the stages we move through and the abiotic factors which have an influence. Practical fieldwork involves data collection on a line transect using indicator species to identify seral stages. Classwork uses field data to produce a species distribution graph. Students can compare this with expected results and suggest reasons for variation. | Activity sheets, digital camera, PC, infiltration kit, pH kit, soil thermometer, moisture meter, tape measure, Profiling Kit, quadrat, plant ID guides, Pocket ID books, anemometer. | Loch Ranza | SQA Biology Higher: Unit 3: Control and Regulation (Higher): 4 Environmental influences: c) Population dynamics. SQA Geography Higher: Physical Environments Unit (Higher): Topic d Biosphere: Key Topic 2. |
| | Ecosystems in the British Isles, The Interrelationships of Soils and Topography | Fieldwork consists of a transect covering both north and south facing slopes. Data on soil, climate, vegetation, topography and land use is gathered at a number of sites and in a variety of habitats including deciduous woodland and heathland. Data is processed using IT, and statistical calculations include Chi-Square and Spearman's Rank tests. | Activity sheets, digital camera, PC, infiltration kit, soil thermometer, moisture meter, pH kit, profiling kit, quadrats, plant ID guides, Pocket ID books, anemometer. | Loch Ranza | SQA Biology Higher: Unit 3: Control and Regulation (Higher): 4 Environmental influences: c) Population dynamics. SQA Geography Higher: Physical Environments Unit (Higher): Topic d Biosphere: Key Topic 2. |
| | Farming and Biodiversity | A short walk through the countryside is taken to gain an understanding of man's uses of land. This unit addresses man's influence in terms of historical change, sustainability and biodiversity. Farming methods are reviewed in the context of nutrient cycling, the water cycle and geology. The concepts attached to the use of pesticides, herbicides and other pest control methods are discussed, along with the attendant issues of non-native and alien species. In addition, there will be the opportunity to examine concepts such as countryside access and wildlife corridors. | Activity sheets, digital cameras, soil auger. | Barton Hall, Little Canada and Osmington Bay | SQA Geography Higher: Human Environments Unit (Higher): Topic b Rural Geography Key topics 1, 2, 3. |
| | Heathland Ecology and Management | An investigation of open heathland is undertaken. Line transects are made and measurements taken including pH, light levels and soil type. Quadrats are used to examine plant species along the transect. Expected changes in diversity within physical parameters are discussed, along with the role of heathland in the nitrogen and carbon cycles. In addition, the management and land uses of the area are discussed. Data analysis and statistical tests can be used to complete a report on the investigation. | Activity sheets, digital camera, Pocket PC, infiltration kit, soil thermometer, moisture meter, pH kit, profiling kit, quadrat, plant ID guides, Pocket ID books, anemometer. | Barton Hall and Osmington Bay. | SQA Biology Higher: Unit 3: Control and Regulation (Higher): 4 Environmental influences: c) Population dynamics. SQA Geography Higher: Physical Environments Unit (Higher): Topic d Biosphere: Key Topic 2. |
| | Impacts of Grazing | This course investigates grazing pressures by comparing species diversity at different sites. An introduction explains the effects of grazing and discusses which vegetation is most susceptible to heavy grazing pressures. Management practices used to reduce pressure on damaged ecosystems are introduced with the idea of managing habitats for a variety of species. Fieldwork consists of quadrats carried out in a heavily grazed field and an ungrazed enclosure. | Activity sheets, digital camera, Pocket PC, infiltration kit, pH kit, soil thermometer, moisture meter, tape measure, quadrat, plant ID guides, Pocket ID books, anemometer. | Loch Ranza | SQA Geography Higher: Human Environments Unit (Higher): Topic b) Rural geography Key topics 1, 2. Environmental Interactions Unit (Higher): Interaction (a) –Rural land resources Key topics 2, 3, 4, 5; |
| | Introduction to Ecology and Sampling Techniques | The aim of this session is to familiarise students with the general principles and definitions of ecology. Sampling techniques to be used during the week are introduced in the classroom with an explanation of the theory behind quadrats and transects and the sampling methods associated with each. Students carry out a short exercise in determining optimum quadrat size. Systems used within quadrats include the ACFOR scale, % cover and point sampling. | Activity sheets, digital camera, PC, profiling kit, 100% quadrat, 10cm quadrat, Identification sheets and books. | Loch Ranza | SQA Biology Higher: Unit 3: Control and Regulation (Higher): 4 Environmental influences: c) Population dynamics. SQA Geography Higher: Physical Environments Unit (Higher): Topic d Biosphere: Key Topic 2. |
| | Investigations and Sampling Techniques | This unit provides students with an introduction to a variety of different data collection techniques, both in theory and practically as part of an investigation. Techniques that can be covered include belt transects, line transects, random sampling, quadrats and 'mark, release and recapture'. Students' work will have an emphasis on experimental design, accurate and consistent data collection, hypothesis testing and statistical analysis. | Activity sheets, digital camera, Pocket PC, infiltration kit, pH kit, soil thermometer, moisture meter, profiling kit, quadrat, plant ID guides, Pocket ID books, anemometer. | Barton Hall, Little Canada and Osmington Bay | SQA Biology Higher: Unit 3: Control and Regulation (Higher): 4 Environmental influences: c) Population dynamics. SQA Geography Higher: Physical Environments Unit (Higher): Topic d Biosphere: Key Topic 2. |
| | Lithoseral and Haloseral Succession | This is a study of the colonization of a bare rock substrate. By performing accurate and detailed line transects students can observe the changes in succession. They will also begin to appreciate the importance of conservation and management of fragile ecosystems. Students test their hypotheses using Spearman's Rank Coefficient calculation to determine if there is a relationship between different environmental factors, e.g. between the pH of the soil and species number. Remaining time can be spent writing up the methodology and discussing the day's findings. | Activity sheets, digital cameras, Pocket PC, thermometer, profiling kit moisture meter, pH kit quadrat, infiltration kit, stopwatch, plant ID sheets, identification books. | Osmington Bay | SQA Biology Higher: Unit 3: Control and Regulation (Higher): 4 Environmental influences: c) Population dynamics. SQA Geography Higher: Physical Environments Unit (Higher): Topic d Biosphere: Key Topic 2. |

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| | Marine Zonation | Horizontal succession is studied using line transects across the littoral zone to measure the percentage and/or frequency cover of the organisms. Vertical zonation studies can also be carried out, using a 10cm quadrat - vertically on the rocks - to examine changes in species number and diversity on a small scale. Both methods are ideal for students undertaking projects with an emphasis on experimental design, accurate and consistent data collection, hypothesis testing and statistical analysis alongside concepts such as Ballantine's scale of exposure. | Activity sheets, digital camera, Pocket PC, profiling equipment, 100% quadrat, 10cm quadrat, identification sheets and books, bug pots. | Barton Hall, Little Canada and Osmington Bay | SQA Biology Higher: Unit 3: Control and Regulation (Higher); 4 Environmental influences: c) Population dynamics |
| | Psammoseral Succession | A Nature Reserve system is an ideal location for studying the abiotic and biotic factors of succession over sand and the factors that affect this process. Opportunities are provided to study different approaches to sustainable development and how humans impact upon succession. Data analysis and statistical tests can be used to complete a report on the investigation. | Activity sheets, digital camera, Pocket PC, infiltration kit, pH kit, soil thermometer, moisture meter, profiling kit, quadrat, plant ID guides, Pocket ID books, anemometer. | Barton Hall and Osmington Bay. | SQA Biology Higher: Unit 3: Control and Regulation (Higher); 4 Environmental influences: c) Population dynamics. SQA Geography Higher: Physical Environments Unit (Higher); Topic d Biosphere: Key Topic 2. |
| | Stream Ecology | Students investigate how a river changes along its course from source to mouth, focusing on the change in invertebrate communities. Students use kick and sweep sampling alongside identification keys, recording their findings on pocket computers. Digital photographs help to identify sample sites, and the reasons for changes along the river are examined fully, including pollution levels, land use and management. | Activity sheets, Pocket PC, digital camera, channel profile kit, flow meters, sediment roundness chart, pH meters, sweep nets, bug pots, identification books and sheets. | Barton Hall, Little Canada and Osmington Bay | SQA Biology Higher: Unit 3: Control and Regulation (Higher); 4 Environmental influences: c) Population dynamics |
| | Woodland Ecology | Students conduct a comparative investigation of coniferous and deciduous woodland. Line transects are made and measurements taken, including pH, light levels and soil type. Students use quadrats to examine plant species in different layers of woodland. Expected changes in diversity within physical parameters are discussed, along with the role of woodland in the nitrogen and carbon cycles. | Activity sheets, digital camera, Pocket PC, infiltration kit, pH kit, soil auger, soil thermometer, moisture meter, profiling kit, 2 quadrats, plant ID guides, Pocket ID books, anemometer, light meter. | Barton Hall, Little Canada and Osmington Bay | SQA Biology Higher: Unit 3: Control and Regulation (Higher); 4 Environmental influences: c) Population dynamics. SQA Geography Higher: Physical Environments Unit (Higher); Topic d Biosphere: Key Topic 2. |

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| Environmental Science | Freshwater Pollution | Students investigate pollution levels in a freshwater system, using biotic and abiotic factors. Moving between sample sites, they will focus primarily on the change in invertebrate communities. In addition, factors such as nitrate levels are measured. Pupils use sweep sampling and identification keys, recording their findings on pocket computers. Digital photographs help to identify sample sites and the reasons for changes between the sample sites are examined fully, including pollution levels and land use and management. | Activity sheets, digital camera, Pocket PC, bug pots, tray, flexible net, identification guides and sheets, BMWP index, pH kit, nitrate test kits. | Barton Hall, Little Canada and Osmington Bay | SQA Biology Higher: Unit 3: Control and Regulation (Higher); 4 Environmental influences: c) Population dynamics |
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| Geology | Field Mapping | This session provides a useful test of geological knowledge, allowing students time to visit a number of localised outcrops in order to identify and record (on the base map and in their notebooks) different types and ages of rock and the boundaries between them. This half-day session can be scheduled with the session on Hutton's Unconformity - see below. | Activity sheets, rock guides, compass clinometer, metre ruler, spirit level, callipers, sediment charts, digital camera. | Loch Ranza | SQA Geology Higher: FOSSILS AND STRATIGRAPHY: Stratigraphy; Principles of stratigraphy; Geological history of the local area. |
| | Geological Investigation | Students are introduced to the concepts of rock types, the rock cycle, weathering, erosion and the processes that have led to the formation of a local geological landmark. They can investigate human activity that has consequently shaped the landscape and collect fieldwork data. The data gathered in the field along with digital photos taken can be used to produce a presentation of the day's geological study. | Activity sheets, sample fossils, fossil and rock guides, compass clinometer, metre ruler, spirit level, digital camera. | Osmington Bay, Little Canada | SQA Geology Higher: MINERALS AND ROCKS: Minerals, Rocks, Sedimentary Rocks, Structural Geology |
| | Geology, Rocks and Fossils | Pupils examine sedimentary rocks formed under a range of environmental conditions. They will also have the opportunity to discuss the tectonic events that have shaped the landscape, with specific reference to the site they are visiting. Students then have the opportunity to hunt for fossils and examine the process of fossilisation from living creature to potential museum piece. | Activity sheets, pencils, clipboards, sample fossils, fossils and rock guides, compass clinometer, metre ruler, spirit level, digital camera. | Osmington Bay, Little Canada | SQA Geology Higher: MINERALS AND ROCKS: Minerals, Rocks, Sedimentary Rocks, Structural Geology. FOSSILS AND STRATIGRAPHY: Fossils, Stratigraphy, Geological history of the local area. |
| | Hutton's Unconformity | This half-day session provides an opportunity for students to visit a unique locality, made famous by one of the founding fathers of geology, James Hutton, who visited Arran in 1787. The session starts with an introduction to the historical background and importance of the location before students investigate the site themselves, identifying the characteristics of the different rock types, leading to their deduction of where the Unconformity actually lies. (NB: This location can be used for a geological investigation.) | Activity sheets, rock guides, compass clinometer, metre ruler, spirit level, callipers, sediment charts, digital camera. | Loch Ranza | SQA Geology Higher: MINERALS AND ROCKS: Rocks; Igneous rocks; Metamorphic Rocks, Sedimentary Rocks. EARTH PHYSICS, STRUCTURAL GEOLOGY AND PLATE TECTONICS: Structural geology. |
| | Igneous Rocks and Processes | The day starts with a coach trip to the south west of the island to look at the relationship between igneous rocks formed during the Tertiary period and the local Permian sediments, a close examination of which enables students to deduce the probable environment of deposition. Observations concerning the field relationships between the Permian sediments and the igneous rocks, in particular baked and chilled margins, provides evidence for intrusive of various types and lithologies. (NB: Certain locations within the day provide opportunity for assessment.) | Activity sheets, rock guides, compass clinometer, metre ruler, spirit level, callipers, sediment charts, digital camera. | Loch Ranza | SQA Geology Higher: MINERALS AND ROCKS: Rocks; Sedimentary rocks; Igneous rocks. EARTH PHYSICS, STRUCTURAL GEOLOGY AND PLATE TECTONICS: Structural Geology; Plate tectonics. FOSSILS AND STRATIGRAPHY: Stratigraphy; Principles of stratigraphy; Geological history of the local area. |
| North Atlantic Spreading and Crustal Tension | A drive down to the southern end of the island allows students to observe the voluminous amounts of basic igneous rocks intruded during the Tertiary period. Baked and chilled margins are examined and measurements of trends/thicknesses and compositions of the rocks taken to discover if any patterns occur in their distribution. | Activity sheets, rock guides, compass clinometer, metre ruler, spirit level, callipers, sediment charts, digital camera. | Loch Ranza | SQA Geology Higher: MINERALS AND ROCKS: Rocks; Igneous Rocks. EARTH PHYSICS, STRUCTURAL GEOLOGY AND PLATE TECTONICS: Structural Geology; Plate tectonics. FOSSILS AND STRATIGRAPHY: Geological history of the local area | |

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| People, Rocks and Landscapes | Visiting a number of localities students will see how geology, as a natural resource, can have a massive impact on the environment and character of an area. Igneous geological features can attract industries, particularly tourism but can also produce areas of natural beauty and scientific importance thereby introducing conflict over a variety of issues. Students can create a report of their findings based on the viewpoints of people living in the community. | Activity sheets, rock guides, compass clinometer, metre ruler, spirit level, digital camera. | Barton Hall | SQA Geology Higher: MINERALS AND ROCKS: Minerals, Rocks, Igneous rocks, Structural Geology |
| Quaternary Climate Change | Arran's landscape is in large part fashioned by the most recent events of the last glacial/interglacial period. Students are taken on an excursion to sample at first hand the characteristics of this landscape and at the same time investigate in more detail the characteristics of the various drift deposits which provide evidence for past processes. This day can be used for a comparative investigation following the principle "The present is the key to the Past" | Activity sheets, rock guides, compass clinometer, metre ruler, spirit level, callipers, sediment charts, digital camera. | Loch Ranza | SQA Geology Higher: MINERALS AND ROCKS: Rocks; Sedimentary rocks. FOSSILS AND STRATIGRAPHY: Stratigraphy; Principles of stratigraphy; Geological history of the local area. |
| Sedimentary Sequences and Palaeo-Climatic Change | The aim of the day is for students to observe and recognise different sedimentary structures and characteristics, including fossil assemblages, which provide evidence of changing environmental conditions through time. This can take place along Corrie foreshore or during a walk around the north east coast of Arran. The day is focused on Carboniferous strata and the cyclical nature through time. | Activity sheets, fossil and rock guides, compass clinometer, metre ruler, spirit level, callipers, sediment charts, digital camera. | Loch Ranza | SQA Geology Higher: MINERALS AND ROCKS: Sedimentary rocks. FOSSILS AND STRATIGRAPHY: Fossils; Evolution: Zones; Stratigraphy; Principles of stratigraphy; Geological history of the local area. |
| Structural and Metamorphic Geology | Students often begin their visit by looking at Arran's oldest rocks - the Dalradian - which are found in the north of the island and also close to its' centre. During the day students learn to adopt a system of observation, simple deduction and recording which allows them to look at and record the characteristics of the various rocks and gain clues concerning their probable formation. In addition they learn to use compass clinometers and grain size cards. | Activity sheets, rock guides, compass clinometer, metre ruler, spirit level, callipers, sediment charts, digital camera. | Loch Ranza | SQA Geology Higher: MINERALS AND ROCKS: Rocks; Metamorphic rocks. EARTH PHYSICS, STRUCTURAL GEOLOGY AND PLATE TECTONICS: Structural Geology; FOSSILS AND STRATIGRAPHY: Stratigraphy; Principles of stratigraphy; Geological history of the local area. |

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| Human Geography | Coastal Investigation - including Features and Management | Students are set a long-shore drift investigation on a stretch of shingle beach with defined aims and hypotheses. Beach profiles are taken using a levelling technique. Coastal processes and features are discussed in a series of field talks including tides, coastal erosion, raised beaches and the implications of sea level change. Coastal management techniques including gabion construction and environmental impact are also studied. A section of sand dunes backed by a golf course provides a good case study of human impact. | Activity sheets, questionnaires, profiling kit, digital camera. | Loch Ranza | SQA Geography Higher: Physical Environments Unit (Higher): Topic c Lithosphere: Key Topics 1, 2. |
| | Coastal Management | Students examine the conflicts that arise from coastal erosion and the options for coastal management. They investigate different types of coastal defences through field sketches and discuss how they should be managed in the future through a decision matrix. Each option is examined through cost benefit analysis and all relevant economic, social, educational and industrial impacts are investigated and discussed. | Activity sheets, clipboards, questionnaires, digital camera. | Barton Hall, Little Canada and Osmington Bay | SQA Geography Higher: Physical Environments Unit (Higher): Topic c Lithosphere: Key Topics 1, 2. |
| | Consuming the rural landscape, Leisure and Tourism | A case study of the impacts of leisure and tourism on people and the landscape. An introduction considers the history and development of tourism from the early Victorian travellers to the package holidays and day trippers of the modern day. Fieldwork focuses on the direct impact of tourism in the form of footpath erosion. Field stops provide information on the attraction of the natural environment and management strategies. | Activity sheets, questionnaires, profiling kit, quadrats, plant ID guides, digital camera. | Loch Ranza | SQA Geography Higher: Human Environments Unit (Higher): Topic b Rural Geography Key topics 2, 3. Environmental Interactions Unit (Higher): Topic Interaction (a) —Rural land resources: Key topics 3 and 4. |
| | Drainage Basins, Flooding and Management | Students focus on factors affecting channel flooding and the drainage basin characteristics of two rivers. Field studies include consideration of rejuvenation, interception, infiltration, rate of through-flow and storm hydrographs. A proposed housing scheme on the flood plain provides a cost/benefit analysis study and highlights river management techniques. | Activity sheets, PC, digital camera, channel profile kit, flow meters, callipers, sediment roundness chart. | Loch Ranza | SQA Geography Higher: Physical Environments Unit (Higher): Topic b Hydrosphere: Key Topics 1, 2. |
| | Investigation Skills and Sampling Techniques | This option equips students with the necessary skills to describe, under exam conditions, how they would carry out a geographical investigation. The stages of an investigation are followed from title and hypothesis setting to evaluation and conclusions. Fieldwork techniques on a salt marsh area focus on the appropriate use of a wide variety of sampling methods and techniques including, choosing the right size of quadrat for the area and habitat and selecting between quantitative and qualitative data. | Activity sheets, digital cameras, quadrats, profiling kit, questionnaires, land use maps. | Loch Ranza | SQA Geography Higher: Physical Environments Unit (Higher): Topic d Biosphere: Key Topic 2. |
| | Population and Rural Settlements | A case study for population change, sustainability and rurality. This option sets out clear aims and objectives which are followed up by data collection in a number of local settlements. Techniques include place check, service assessments, questionnaires and landscape character assessments. Students study how the local population has changed over time using GIS generated data, and research solutions to population change problems. | Activity sheets, questionnaires, digital camera. | Loch Ranza | SQA Geography Higher: Human Environments Unit (Higher): Topic a Populations Geography Key topics 2, 3; Topic b Rural Geography Key topics 1, 2, 3. |
| | Rural and Urban Issues | For rural issues, students investigate the changing function of a village over time and the issues associated with rural settlements. Geographical techniques are used to illustrate how an area has changed over time. Evidence of the impact of other settlements and the rural employment levels and type are discussed. For urban issues, producing land use classification maps of town centres allows students to investigate patterns in retail settlements and settlement function. Development of towns over time can be demonstrated through a study of building type and the CBD can be mapped. | Activity sheets, digital cameras, questionnaires, land use maps | Barton Hall, Little Canada and Osmington Bay | SQA Geography Higher: Human Environments Unit (Higher): Topic b Rural Geography Key topics 1, 2, 3; Topic d Urban Geography Key topics 1, 2, 3. |

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| Rural Rebranding and Regeneration | This option provides a case study for rebranding the local area as a modern tourist destination. Field studies follow set aims and objectives at various locations. Students investigate the need for change and the mechanisms of change focusing on the 'key players'. | Activity sheets, questionnaires, digital camera. | Loch Ranza | SQA Geography Higher: Human Environments Unit (Higher): Topic b Rural Geography Key topics 1, 2, 3. Environmental Interactions Unit (Higher): Topic Interaction (a) —Rural land resources: Key topics 3 and 4. |
| Rural Settlements | Students investigate the changing function of a village over time and the issues associated with rural settlements. Geographical techniques are used to formulate an image of how an area has changed over time. Evidence of the impact of other settlements and the rural employment levels and type are discussed. Using evidence including digital photos and house age comparisons, students can produce a presentation or report of their investigation, including graphical and numerical data. | Activity sheets, digital cameras, land use maps. | Barton Hall, Little Canada and Osmington Bay | SQA Geography Higher: Human Environments Unit (Higher): Topic b Rural Geography Key topics 1, 2, 3. |
| Urban Settlements | Producing land use classification maps of town centres allows students to recognise and investigate patterns in retail settlements and settlement function. Development of towns over time can be demonstrated through a study of building type and the CBD can be mapped. A report or presentation incorporates data collected. Alternatively land use maps can be completed and classification discussed. | Activity sheets, digital cameras, questionnaires, land use maps. | Barton Hall, Little Canada and Osmington Bay | SQA Geography Higher: Human Environments Unit (Higher): Topic d Urban Geography Key topics 1, 2, 3. |
| Urban Studies, Regeneration and Rebranding | A case study of a key UK city. We consider changing population, employment, land use and tourism influence over time. Linked to this are strategies used by national and local government to deal with change and the need for change. A wide variety of practical field work techniques are included in this study. Data analysis includes statistical calculations, IT and GIS resources. The option can involve a full day to gather data only or a day and a half including follow-up studies. | Activity sheets, questionnaires, digital camera, PC. | Loch Ranza | SQA Geography Higher: Human Environments Unit (Higher): Topic d Urban geography 1, 2, 3. Environmental Interactions Unit (Higher): Topic Interaction (d) — Urban change and its management: 1, 2, 3, 4, 5. |

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| Physical Geography | Coastal Processes and Features | By working as part of a team pupils profile a beach, taking accurate measurements, which are entered onto a pocket computer. Pupils discuss beach formation and the reasons why beaches differ in shape and sediment size. Pupils then discuss the results they have obtained and suggest why sediment size varies in relation to its position on the beach. Simple experiments allow observations of long shore drift and wave refraction. | Activity sheets, profiling kit, digital camera. | Barton Hall, Little Canada and Osmington Bay | SQA Geography Higher: Physical Environments Unit (Higher): Topic c Lithosphere: Key Topics 1, 2. |
| | Cold Environments | Superb examples of cold environment features are discussed in a series of field talks. Topics include glacial and fluvioglacial landforms and their formation. A case study is made of a classic glacial valley, focusing on its formation in the past and its uses today. This includes consideration of UK glacial history, trigger theories, glacier characteristics, features of erosion and deposition. | Activity sheets, digital camera. | Loch Ranza | SQA Geography Higher: Physical Environments Unit (Higher): Topic c Lithosphere: Key Topics 1, 2. |
| | Earth Hazards: Earthquakes and Volcanoes | This option involves a series of field talks focusing on processes and features of volcanicity and plate tectonics. Aspects covered include extrusive landforms, intrusive landforms, types of plate boundary and the impact of volcanic activity on the landscape and population. | Activity sheets, rock guides, compass clinometer, spirit level, metre ruler, digital camera. | Loch Ranza | SQA Geography Higher: Physical Environments Unit (Higher): Topic c) Lithosphere Key topics 1 and 2. |
| | Rivers | The form and function of rivers can be studied from source to mouth in this river investigation, including width, depth, velocity, hydraulic radius, wetted perimeter, land use, surface run off, sediment size and common fluvial formations such as point bars, meanders, river cliffs and braided channels. Students can also relate their findings to the human influence upon the sample sites. The data gathered in the field and digital photos taken can be used to write-up the day's findings. | Activity sheets, Pocket PC, digital camera, channel profile kit, clinometer, flow meters, callipers, sediment roundness chart, ranging poles. | Barton Hall, Little Canada, Lochranza, Osmington Bay | SQA Geography Higher: Physical Environments Unit (Higher): Topic b Hydrosphere: Key Topics 1, 2. |
| | Sediment Analysis | An opportunity for a practical investigation linked to Cold Environments, Rivers or Coastal Investigation. Exposures of sediment are analysed at five locations – three of known origin and two unknown. Fieldwork techniques assess size, shape, orientation and stratification. Graphical presentation, statistical and IT analysis help interpret data and identify the environment of deposition. | Activity sheets, sediment charts, callipers, digital camera. | Loch Ranza | SQA Geography Higher: Physical Environments Unit (Higher): Topic b Hydrosphere: Key Topics 1, 2. Topic c Lithosphere: Key Topics 1, 2. |

