Secondary

Contents

Introduction

This section concentrates on secondary-specific information and guidance, including appropriate National Curriculum Programmes of Study, careers and qualifications and case studies of sailing activities well established in the curricula of three secondary schools. The examples given demonstrate clearly the potential for linking the teaching of sailing with practical subjects such as physical education, science, design and technology.

The ASDAN Youth Award Scheme referred to in this section and earlier in the **Why Sail?** section is an excellent example of cross-curricular work which promotes collaboration between colleagues in different subject departments. The challenge exists to extend this collaboration and tap the under-used potential of sailing activities as a stimulus for creative aspects of subjects such as English, art and music.

Note:
Earlier sections of this handbook also contain material of potential use to secondary colleagues, notably:

- the **Why Sail?** section with its curricular and cross-curricular arguments;
- the **Safety** section with practical guidance covering pupils of all ages, staff and adult helpers;
- and the **Getting started** section with its guidance on learning to sail and organising residential visits.

The **Primary** and **Special** sections contain their own specific guidance but they too offer much of relevance to the secondary phase.

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Sailing in the secondary curriculum

Sailing can provide a stimulating and effective vehicle for learning in most, if not all, of the National Curriculum subjects. However, PE is the only subject with specific references to **Outdoor and Adventurous Activities** in its Programmes of Study. General requirements 'to promote physical activity and healthy lifestyles', 'to develop positive attitudes' and 'to ensure safe practice' clearly apply to sailing.

The extracts below contain the elements of PE which can be taught through sailing. These are followed by similar extracts for Science and Design and Technology, two additional subjects with clear potential for study through sailing contexts.

National Curriculum PE, Key Stages 3 and 4

Summary of requirements related to Sailing

General Requirements

Physical education should involve pupils in the continuous process of planning, performing and evaluating. This applies to all areas of activity. The greatest emphasis should be placed on the actual performance aspect of the subject. The following requirements apply to the teaching of physical education across all key stages.

1. **To promote physical activity and healthy lifestyles**, pupils should be taught:
   a to be physically active
   b to adopt the best possible posture and the appropriate use of the body
   c to engage in activities that develop cardiovascular health, flexibility, muscular strength and endurance
   d the increasing need for personal hygiene in relation to vigorous physical activity

2. **To develop positive attitudes**, pupils should be taught:
   a to observe the conventions of fair play, honest competition and good sporting behaviour as individual participants, team members and spectators
   b how to cope with success and limitations in performance
   c to try hard to consolidate their performances
   d to be mindful of others and the environment

3. **To ensure safe practice**, pupils should be taught:
   a to respond readily to instructions
   b to recognise and follow relevant rules, laws, codes, etiquette and safety procedures for different activities or events, in practice and during competition
   c about the safety risks of wearing inappropriate clothing, footwear and jewellery and why particular clothing, footwear and protection are worn for different activities
   d how to lift, carry, place and use equipment safely
   e to warm up for and recover from exercise

Key Stage 3 Programme of Study

Throughout the key stage, pupils should be given opportunities to engage in health-promoting physical activity, where possible within the local community. They should be taught:

- how to prepare for particular activities and to recover afterwards;
- the short-term and long-term effects of exercise on the various body systems;
- the role of exercise in establishing and maintaining health.

Area of Activity 5. Outdoor and adventurous activities
Pupils should be taught:

Unit A

a. to perform at least one outdoor and adventurous activity, either on or off the school site
b. to apply the techniques and skills specific to the activity or activities undertaken
c. to plan and review the activity or activities undertaken

Unit B

d. to perform at least one other outdoor and adventurous activity, including, where possible, off-site work in unfamiliar environments
e. a variety of roles in each activity, including leading, being led and sharing

End of Key Stage Description, Key Stage 3
Pupils devise strategies and tactics for appropriate activities and plan or compose more complex sequences of movements. They adapt and refine existing skills and apply these to new situations. Pupils show that they can use skills with precision and perform sequences with greater clarity and fluency. Pupils recognise the importance of rules and apply them. They appreciate strengths and limitations in performance and use this information in co-operative team work as well as to outwit the opposition in competition. They understand the short-term and long-term effects of exercise on the body systems and demonstrate how to prepare for particular activities and how to recover after vigorous physical activity.

Key Stage 4 Programme of Study

Throughout the key stage, pupils should be given opportunities to participate in frequent physical activity conducive to a healthy lifestyle. They should be taught:

- to plan, undertake and evaluate a safe health-promoting exercise programme
- to show understanding of the principles involved

Areas of Activity 5. Outdoor and adventurous activities
Pupils should be taught:

a. to prepare for and undertake a journey safely, encompassing one or more activities, eg canoeing, fell walking, rock climbing, in an unfamiliar environment
b. to develop their own ideas by creating challenges for others
c. increasingly complex techniques and the safety procedures appropriate to the activity or activities undertaken
d. the effects of nutrition and climatic conditions on the body, through the activity
or activities undertaken and be aware of, and respond to, changing environmental conditions

End of Key Stage Description, Key Stage 4
Pupils demonstrate increasingly refined techniques in their selected activities. Their performance is more consistent and effective. They anticipate responses from others and use this information to adapt their own performance. They undertake different roles, such as performer, coach, choreographer and official. They evaluate accurately and make judgements using relevant technical terms. They regularly participate in health-promoting physical activity and show an understanding of the principles used to prepare and monitor an exercise programme for a healthy lifestyle.

Exceptional Performance
Pupils demonstrate outstanding ability in at least two activities, showing a high degree of consistency and effectiveness in their performance. They understand and apply increasingly advanced techniques. They show initiative and independence in organising activities for themselves and others. They devise and use appropriate criteria for judging and improving their own and others' performance using relevant technical terms accurately and confidently. They plan, undertake and evaluate an appropriate health-related exercise programme, showing a thorough understanding of the principles involved and with due regard to safety.

National Curriculum Science, Key Stages 3 and 4
Examples of requirements related to Sailing

The National Curriculum science programmes of study requirements are set out across **Experimental and Investigative Science**, **Life Processes** and **Living Things**, **Materials and their Properties** and **Physical Processes**. All of these themes provide a wealth of opportunities for using sailing activities as a vehicle for learning. Examples include the studies of:

- *health and safety* which is a general requirement across all four themes
- *living things in their environment* within **Life Processes and Living Things** as part of a residential course programme which takes advantage of the sailing centre location to do fieldwork
- *forces and motion* within **Physical processes**, undertaken as either school-based or sailing centre-based practical activities

Examples which have explicit relevance to sailing are detailed below.

Key Stage 3 Programme of Study

5. Health and safety Pupils should be taught to:

a take responsibility for recognising hazards in a range of work with living things, materials and devices with which they are familiar
b use appropriate information sources to assess risks, both immediate and cumulative
c apply their knowledge and take action to control the risks to themselves and to others

Physical Processes
2. Forces and motion

force and linear motion Pupils should be taught:

a how to determine the speed of a moving object
b the quantitative relationship between speed, distance and time
c that unbalanced forces change the speed and/or direction of moving objects
d that balanced forces produce no change in the movement of an object
e ways in which frictional forces, including air resistance, affect motion, eg the effect of air resistance on a descending parachute, the effect of friction between a tyre and a road

force and rotation Pupils should be taught:

f that forces can cause objects to turn about a pivot
g the principle of moments and its application to situations involving one pivot

force and pressure Pupils should be taught:

h the quantitative relationship between the force acting normally per unit area on a surface and the pressure on that surface
i some applications of this relationship, eg the use of snow shoes, the effect of sharp blades

Key Stage 4 Programme of Study

5. Health and safety Pupils should be taught to:

a take responsibility for recognising hazards in a range of materials, activities and environments, including the unfamiliar
b use information sources in order to assess the risk of the unfamiliar
c manage their working environment and justify the action taken to control risks

Physical Processes

2. Forces and motion (Double)

force and acceleration Pupils should be taught:

a how distance, time and speed can be determined and represented graphically
b about factors affecting vehicle stopping distances
c the difference between speed and velocity
d about acceleration as change in velocity per unit time
e that balanced forces do not alter the velocity of a moving object
f the quantitative relationship between force, mass and acceleration
g that when two bodies interact, the forces they exert on each other are equal and opposite

National Curriculum Design and Technology, Key Stages 3 and 4

Examples of requirements which can relate to Sailing

The National Curriculum design and technology programme of study requirements are set out across **Designing Skills**, **Making Skills** and **Knowledge and Understanding**. All three themes provide a wide range of opportunities for using sailing vessels, equipment, materials as a vehicle for learning and for tackling practical problems through designing and making both models and full size products. The programmes of study for Key Stages 3 and 4, slightly abridged, are reproduced in below:

Key Stage 3 Programme of Study

Pupils should be taught to develop their design and technology capability through combining their Designing and Making skills (paragraphs 3 and 4) with Knowledge and understanding (paragraphs 5 to 10) in order to design and make products.

1. Pupils should be given opportunities to develop their design & technology capability through:

a assignments in which they design and make products, focusing on different contexts and materials and including the use of:

- resistant materials
- compliant materials and/or food

Taken together, these assignments should include work with control systems, eg electrical, electronic, mechanical, pneumatic and structures

b focused practical tasks in which they develop and practise particular skills and knowledge
c activities in which they investigate, disassemble and evaluate familiar products and applications

2. Pupils should be given opportunities to:

a work independently and in teams
b apply skills, knowledge and understanding from the programmes of study of other subjects, where appropriate, including art, mathematics and science

3. Designing skills Pupils should be taught to:

a identify appropriate sources of information that will help with their designing
b use design briefs to guide design thinking
c develop a specification for their product
d consider the needs and values of intended users and develop criteria for their design to guide thinking and form a basis for evaluation
e generate design proposals that match stated design criteria and modify proposals to improve them
f consider the aesthetics, function, safety, reliability and cost of their designs
g take account of the working characteristics and properties of materials and components when deciding how and when to use them
h prioritise and reconcile decisions on materials and components, production, time and costs within design proposals
i take account of the restrictions imposed by the capacities and limitations of tools and equipment
j explore, develop and communicate their design ideas by modelling their ideas in an increasing variety of ways, including the use of IT
k develop a clear idea of what has to be done and propose an outline plan which includes alternative methods of proceeding if things go wrong
l evaluate their design ideas as these develop, bearing in mind the users and the purposes for which the product is intended and indicate ways of improving their ideas

4. Making skills Pupils should be taught to:

a use a range of processes to shape and form materials, including forming by wastage, attachment, adhesion and combining
b select materials, tools and equipment appropriate to the task
c select and use appropriate methods of shaping and forming materials accurately
d join and combine additional materials and components accurately in temporary and permanent ways
e use construction kits that offer a wide choice of interconnections and components
f interconnect a variety of components to achieve functional results
g apply a range of finishing techniques appropriate to the materials being used, taking into account the purposes to which the finished products will be put
h make products in quantity, using techniques to ensure consistency
i develop a clear idea of what has to be done and propose an outline plan that includes the materials, equipment and processes to be used and suggests alternative methods of making if first attempts fail
j evaluate their products as these develop, including testing performance against specified criteria
k implement improvements they have identified and take on-going action to ensure that their products meet the specification and their original intentions

Knowledge and understanding

5. Materials and components Pupils should be taught:

a to consider the physical and chemical properties of materials and to relate these properties to the ways materials are worked and used
b that materials can be classified according to their properties and behaviour and the major classifications within the material categories they are using, eg thermoplastics and thermosets

c that materials can be combined, processed and finished, in order to create more useful properties and desired aesthetic effects, eg combining different ingredients to create products with different sensory characteristics
d that heat treatment and the combining of materials alter working and performance characteristics
e that some materials can be formed by pressing or casting, which are important techniques for producing multiple copies

6. Systems and control Pupils should be taught:

a to design, use and interconnect simple mechanical, electrical, electronic and pneumatic systems and sub-systems
b how to interconnect mechanisms to achieve different kinds of movement;
c to use electrical switches to control devices
d to use sensors in switching circuits
e that systems have inputs, processes and outputs and to recognise these in existing products and products they have made
f the importance of feedback and how it can be used to ensure the correct functioning of mechanical, electrical or electronic systems
g to analyse the performance of systems, in order to check that they are working effectively

7. Structures Pupils should be taught:

a to recognise and use structures in their products
b that excessive loads can cause structures to fail by bending, buckling and twisting
c to use simple tests to determine the effects of excessive loads
d to devise suitable methods to reinforce their structures and relate these and other techniques to familiar structures
e to understand that forces, such as compression and tension, produce different effects and to take account of these in making their products

8. Products and applications Pupils should be taught to investigate, disassemble and evaluate a wide range of products and applications, in order to learn how they function and relate products to:

a their intended purpose
b the choice of materials and components and the ways in which they have been used
c the processes used to produce them
d the scientific principles applied
e the views of users and manufacturers
f a range of alternative products

9. Quality Pupils should be taught to distinguish between quality of design and quality of manufacture, in order to identify and use criteria that help them judge the quality of a product, including:

a how far it meets a clear need
b its fitness for purpose
c whether it is an appropriate use of resources
d its impact beyond the purpose for which it was designed, eg on the environment

10. Health and safety Pupils should be taught further knowledge and understanding of health and safety as designers, makers and consumers, including:

a taking responsibility for recognising hazards in a range of products, activities and environments with which they are familiar
b using appropriate information sources to assess the risks, both immediate and cumulative
c applying their knowledge and take action to control the risk to themselves and to others

Key Stage 4 Programme of Study

Pupils should be taught to develop their design and technology capability through combining their Designing and Making skills (paragraphs 3 and 4), with Knowledge and understanding (paragraphs 5 to 9), in order to design and make products.

1. Pupils should be given opportunities to develop their design and technology capability through:

a assignments in which they design and make products. Taken together these assignments should require activity related to industrial practices and the application of systems and control
b focused practical tasks in which they develop and practise particular skills and knowledge
c activities in which they investigate, disassemble and evaluate familiar products and applications

2. Pupils should be given opportunities to:

a apply skills, knowledge and understanding from the programmes of study of other subjects, where appropriate, including art, mathematics and science.

3. Designing skills Pupils should be taught:

a to develop and use design briefs and detailed specifications
b to anticipate and design for product maintenance, where appropriate
c to design for manufacturing in quantity
d to recognise that moral, economic, social, cultural and environmental issues make conflicting demands when designing
e to consider an increasing range of users
f to determine the degree of accuracy required for the product to function as planned, taking account of critical dimensions and tolerances in determining methods of manufacture
g to generate design proposals against stated design criteria and to modify their proposals in the light of on-going analysis and product development;
h how graphic techniques, IT equipment and software can be used in a variety of ways to model aspects of design proposals and assist in making decisions;
i to produce and use detailed working schedules that will achieve the desired objectives and provide alternatives to possible problems
j to be flexible in their working practices, in order to respond to changing circumstances and new opportunities
k to devise and apply test procedures to check the quality of their work at critical points during development and to indicate ways of improving it
l to ensure that the quality of their products is suitable for intended users

4. Making skills Pupils should be taught:

a to match materials and components with tools, equipment and processes
b to use tools and equipment accurately and efficiently to achieve an appropriate fit and finish and reliable functioning in products that match the specification
c a range of industrial applications for a variety of familiar materials and processes
d the difference between quality control and quality assurance
e how products are manufactured in quantity, including the application of quality control and quality assurance techniques
f how computer-aided manufacture (CAM) is used both in manufacturing in quantity and in the production of single items and small batches
g to simulate production and assembly lines

h to produce and use detailed working schedules that will achieve the desired objectives, setting realistic deadlines for the various stages of manufacture, identifying critical points in the making process and providing alternatives to possible problems
i to evaluate the quality of products and to devise modifications that would improve their performance
j to be adaptable in their working practices, in order to respond to changing circumstances and new opportunities
k to devise and apply test procedures to check the quality of their work at critical points during development and to indicate ways of improving it
l to ensure, through testing, modification and evaluation, that the quality of their products is suitable for intended users

Knowledge and understanding

5. Materials and components Pupils should be taught:

a how materials are cut, shaped and formed to designated tolerances
b how materials can be combined and processed in order to create more useful properties and how these properties are utilised in industrial contexts
c how materials are prepared for manufacture, allowing for waste and fine-finishing
d about a variety of self-finishing and applied-finishing processes and to appreciate their importance for aesthetic and functional reasons
e that to achieve the optimum use of materials and components, account needs to be taken of the complex interrelationships between material, form and intended manufacturing processes
f how pre-manufactured standard components are used to improve the effectiveness of the manufacturing process

6. Systems and control Pupils should be taught to develop their understanding of the concepts of input, process and output and the importance of feedback in controlling systems, including:

a how control systems and sub-systems can be designed, used and interconnected to achieve different purposes
b how to incorporate feedback in their own systems
c how to analyse the performance of systems in order to check that they are working effectively

7. Products and applications Pupils should be taught to relate the workings and functions of a wide range of products and applications to:

a the intended purpose of the product
b the components available for use in the product
c the choice of materials and components and the ways in which they have been used
d the processes used to produce them
e the application of scientific principles
f the market for which the product is intended
g the range of alternative products and solutions

8. Quality Pupils should be taught to distinguish between quality of design and quality of manufacture and use further criteria and techniques that help them judge the quality of a product, including:

a how far it meets a clear need
b its fitness for purpose
c whether it is an appropriate use of resources

Key Stage 3 sailing the Hackney way!

The staff of Hackney Education Watersports Centre are keen to encourage secondary teachers without sailing instruction qualifications to make full use of the expertise and facilities at the Banbury Reservoir site. Their teachers' booklet 'Key Stage 3 Sailing and Canoeing' describes the support they offer and how the training links in with National Curriculum requirements.

The following extracts are taken from 'Key Stage 3 Sailing and Canoeing' with the kind permission of Hackney Education Watersports Centre

Assessment information from checklists is keyed into the centre computer and used to generate reports on pupils' achievements. These reports and records of experience provide valuable additions to school Records of Achievement. To complete the Outdoor and Adventurous Activities section of the PE curriculum at KS3, pupils normally participate in 12 x 2 hour sailing sessions and 6 x 2 hour canoeing sessions.

Planning, performing and evaluating

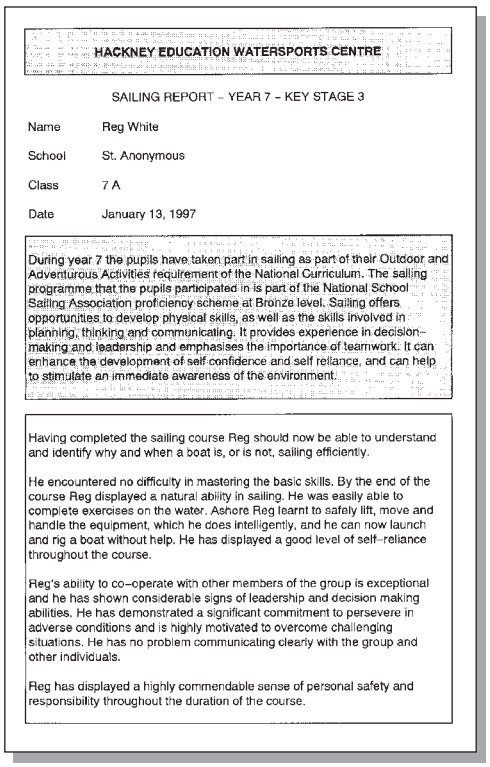
The Hackney KS3 course in Sailing and Canoeing fulfills the requirements of the Outdoor and Adventurous Activities element of the PE National Curriculum. Included in the complete document is a brief justification for watersports in education, the main principles covering planning and performance, a typical report, an example of a record of experience, a flow chart that displays the main elements of evaluation, syllabi of the National Awards that the pupils can gain and an application form.

The course is designed so that no extra load is placed upon teachers. All evaluations and reports are done by Centre staff. The staff are all Senior Instructors with many years experience of teaching school groups.

Hackney Education Watersports Centre operates on Banbury Reservoir in north-east London. With 90 acres of open, inland water, Banbury offers a safe and sensible environment for a wide range of watersports.

The Centre can equip and instruct groups of up to 45 students. All students should be able to swim and will always wear suitable buoyancy-aids while on or near the water. Students with limited or no swimming ability will wear a lifejacket providing additional buoyancy and will undertake a water confidence exercise as soon as possible.

The following example pages are reduced from their original A4 size.



HACKNEY EDUCATION WATERSPORTS CENTRE

SAILING REPORT – YEAR 7 – KEY STAGE 3

Name Reg White

School St. Anonymous

Class 7 A

Date January 13, 1997

During year 7 the pupils have taken part in sailing as part of their Outdoor and Adventurous Activities requirement of the National Curriculum. The sailing programme that the pupils participated in is part of the National School Sailing Association proficiency scheme at Bronze level. Sailing offers opportunities to develop physical skills, as well as the skills involved in planning, thinking and communicating. It provides experience in decision-making and leadership and emphasises the importance of teamwork. It can enhance the development of self-confidence and self reliance, and can help to stimulate an immediate awareness of the environment.

Having completed the sailing course Reg should now be able to understand and identify why and when a boat is, or is not, sailing efficiently.

He encountered no difficulty in mastering the basic skills. By the end of the course Reg displayed a natural ability in sailing. He was easily able to complete exercises on the water. Ashore Reg learnt to safely lift, move and handle the equipment, which he does intelligently, and he can now launch and rig a boat without help. He has displayed a good level of self-reliance throughout the course.

Reg's ability to co-operate with other members of the group is exceptional and he has shown considerable signs of leadership and decision making abilities. He has demonstrated a significant commitment to persevere in adverse conditions and is highly motivated to overcome challenging situations. He has no problem communicating clearly with the group and other individuals.

Reg has displayed a highly commendable sense of personal safety and responsibility throughout the duration of the course.

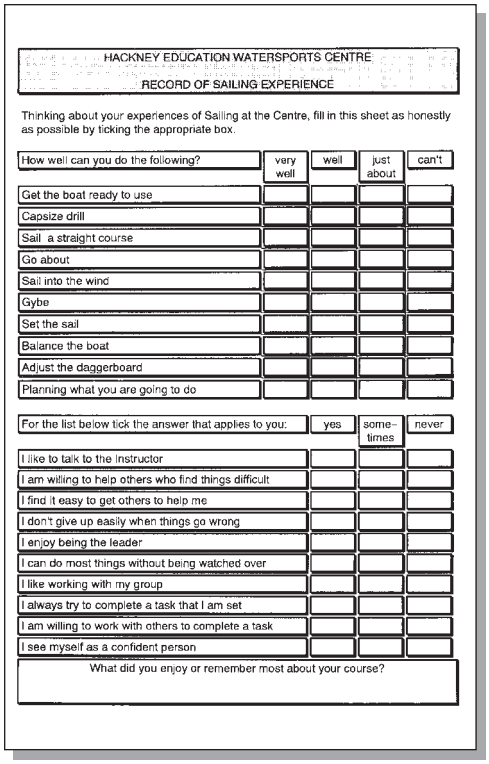
The courses have been developed to satisfy the demands of the 'Outdoor and Adventurous Activities' element at Key Stage 3 of the PE National Curriculum. Both the Sailing and Canoeing elements lead to nationally recognised awards from either the National School Sailing Association or the British Canoe Union.

These give a thorough grounding in the fundamentals in these activities. Students are evaluated on their planning and performance of set tasks once the basic competencies have been achieved. The minimum time required to complete one element at this level is 1/2 a term for canoeing and a whole term for sailing. In addition to the above, the students are evaluated on aspects of their personal and social behaviour.

The training highlights the need for self-reliance, co-operation, leadership, motivation and commitment to a task and communication with the group and the instructor. A student's attitude to their own and others safety is also assessed. The instructors' evaluations are used to produce an A4 report similar to the example shown on the previous page.

Records of Experience

At the end of the course, the student also completes a self-evaluation/record of experience which is also attached to the instructor's report. The back of the self-evaluation sheet doubles as a certificate of completion.



HACKNEY EDUCATION WATERSPORTS CENTRE

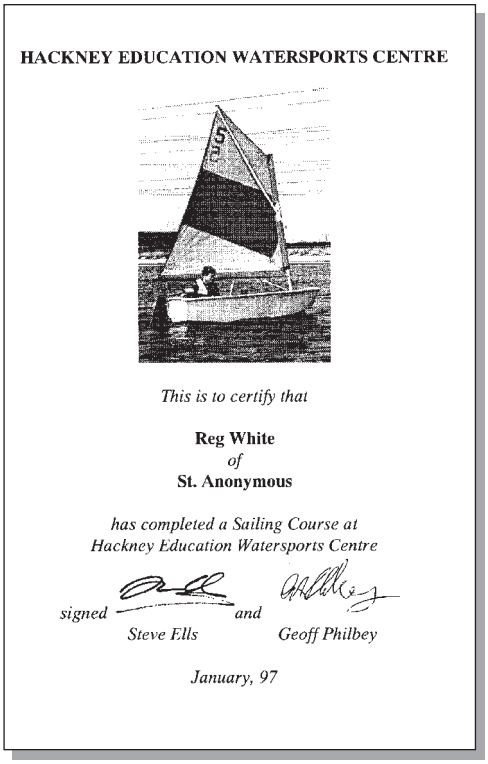
RECORD OF SAILING EXPERIENCE

Thinking about your experiences of Sailing at the Centre, fill in this sheet as honestly as possible by ticking the appropriate box.

How well can you do the following?	very well	well	just about	can't
Get the boat ready to use				
Capsize drill				
Sail a straight course				
Go about				
Sail into the wind				
Gybe				
Set the sail				
Balance the boat				
Adjust the daggerboard				
Planning what you are going to do				

For the list below tick the answer that applies to you:	yes	some-times	never
I like to talk to the instructor			
I am willing to help others who find things difficult			
I find it easy to get others to help me			
I don't give up easily when things go wrong			
I enjoy being the leader			
I can do most things without being watched over			
I like working with my group			
I always try to complete a task that I am set			
I am willing to work with others to complete a task			
I see myself as a confident person			

What did you enjoy or remember most about your course?



HACKNEY EDUCATION WATERSPORTS CENTRE

This is to certify that

Reg White
of
St. Anonymous

has completed a Sailing Course at Hackney Education Watersports Centre

signed ——— *and*

Steve Ells *Geoff Philbey*

January, 97

Each student should complete the self-evaluation and return the sheet to the teacher. This record of experience can then be included in the students Record of Achievement at school. The course is already being used successfully, however the staff at the Centre are happy to discuss adjusting elements of the course to suit a school's individual requirements.

The following diagram shows the practical sailing and PSE skills that are highlighted and assessed throughout the course.

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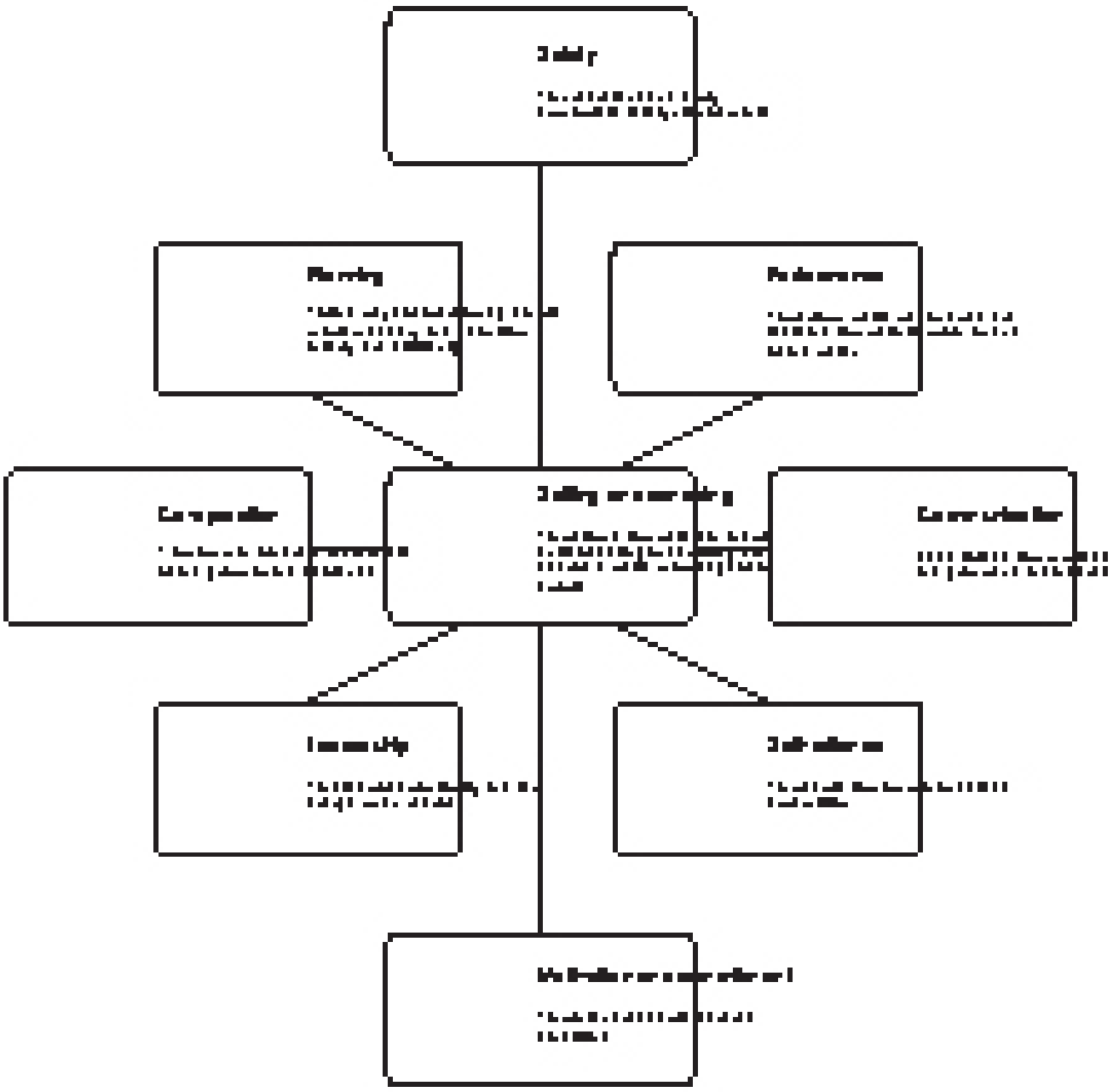
Areas of evaluation



The Instructor uses a checklist to assess each student and awards a mark from I to 5 for each area of assessment. These marks are fed into the Centre computer and used to produce the final reports. The school will receive copies of all marks and duplicate reports can always be produced at a later date. The self-assessment sheet is designed to cover the same areas.

Careers and qualifications

Careers paths related to sailing

The following two articles provide contrasting but complementary views of sailing-related careers. The first, from BMIF, examines specific opportunities in the commercial and manufacturing fields. The second describes careers within outdoor education as a whole. These are followed by an overview of relevant secondary, further and higher education courses.

British marine industry

Adapted with kind permission of BMIF Training from their factsheet **The British Marine Industry**.

The British marine industry covers a wide variety of activities from boat builders and repairers, engines, electric and electronics, chandlery, clothing, hire and charter, holidays - in fact anything that is part of the leisure boating industry and some of the smaller commercial craft too.

The British Marine Industries Federation (BMIF) is the trade federation which draws together all these different activities and provides a central voice for them.

The industry employs approximately 20000 people across the whole range of activities which make up the marine industry and there are, of course, also managers, supervisors, technicians, accountants, drivers and others.

The people who work in the marine industry are invariably enthusiasts about boats in one way or another and pride themselves on the standard of their work. When customers buy a boat, a new fitting or a service for a boat, they want the best and we hope that with the right training we can ensure our industry stays at the top in standards of workmanship.

Five Scottish/National Vocational Qualifications (S/NVQs) have been developed to fall in to line with current Government requirements for commerce and industry and these offer a framework of competence for assessment of skills and demonstration of competence. There is one S/NVQ at level 3 in *Reinstating the Condition and Performance of Boats* and there are four at level 2: *Boat Outfitting*, *Boat Repairing*, *Fibre Reinforced Plastic (FRP) Lamination* and *Boat Building*. There is also a Modern Apprenticeship for the Marine Industry.

There are several colleges, training centres and universities around the country that offer a variety of courses in marine activities such as boatbuilding, yacht design and marine engineering. A list of Colleges, Training Centres and Universities is available from BMIF Training.

There is no specialist recruitment service for the industry - good places to ask around for vacancies are boat shows. A clearly produced CV to companies working in the area in which you are most interested can be useful. The BMIF 1996/97 Yearbook, listing all the BMIF members and giving the name, address, telephone number and some detail about each company. The BMIF also runs a 'Jobseekers' service for people looking for employment in the industry; send a copy of your CV to BMIF Training together with an indication of the type of work you are looking for and we will circulate a summary of your details to all BMIF Member companies.

See the industry on display at the London International Boat Show at Earls Court in January and the Southampton International Boat Show in September.

A brief look at some of the different jobs within the industry

Boatbuilders

There are a few big companies which have a production line type of operation and produce hundreds of boats per year in fibre reinforced plastic (FRP). Some companies make hulls for other firms within the industry, moulding the basic shapes which are then fitted and finished elsewhere. There are also a large number of small firms within the industry who custom-build individual boats in FRP, timber or metal. The boats themselves vary enormously - from dinghies to start children off sailing, through a vast array of pleasure craft - both sail and power - to the very luxurious and expensive.

Boatbuilders sometimes offer a repair service as well, but there are companies that offer purely a repair service, often in all types of boat construction.

Laminators

Laminating is the technique used to make FRP boats and can produce both the basic mouldings and the sets of shapes which make up the cabin top, portholes and ventilation. A double gel coat is used to provide a thick layer of the chosen colour. The layers of fibre which come in different weights are laid on with the resin and are very strong.

Marine Engineers

Marine engineers differ from motor engineers particularly in that the engines have to be capable of operating safely and effectively in a marine environment. A skilled marine engineer will have the knowledge of the many different types of engine available, which come from all comers of the world.

Chandlery

Chandlery covers a wide variety of goods - from shackles and cleats; paints and anti-foulings, to highly technical electronic systems. The companies in this part of the industry therefore vary accordingly. The need for good product knowledge of the items in stock is vital, to ensure that the customer gets the part needed. Chandlery companies and shops also often stock a range of marine clothing.

Holidays, Charter and Hire Operators

Sailing holidays, chartered yachts and narrowboat holidays are available both in the UK and abroad. There are often vacancies for the busy summer months when extra staff are needed to clean and replenish boats at the turnaround, as crews for skippered vessels and as repair staff to ensure the boats are maintained throughout the holiday period.

In addition to **The British Marine Industry**, BMIF produces a factsheet entitled **Universities and training centres providing courses in marine activities**. For copies of these sheets and further information on careers within the marine industry, contact Angela Garman at:

BMIF Training, British Marine Industries Federation, Meadlake Place, Thorpe Lea Road, Egham, Surrey, TW2O 8HE.

Careers in outdoor education

Adapted with kind permission of Adventure Education. From an article by Chris Loynes on **Developing as a Leader**, written for both school leavers and experienced practitioners.

The **Outdoor Source Book** published annually by Adventure Education provides further guidance on careers and qualifications, and includes a comprehensive directory of Further Education, Higher Education, Postgraduate courses and specialist training both in the UK and overseas. See **Resources** section.

By far the greatest amount of outdoor education is undertaken under the leadership of teachers and youth workers working voluntarily or part time as an addition to their main duties. Some of the best outdoor education I have witnessed was undertaken by teachers and play workers who had never heard of the term. These people are not specialists with years of personal experience in outdoor activities and lists of instructing qualifications. They are imaginative and resourceful people who have developed from the traditions of camping trips and nature walks. They have the ability to connect experiences with curriculum objectives linking activities outside with work inside.

This locally provided general adventure and environmental activity is the main stay of primary and lower secondary programmes. Leaders do not need to hold awards or qualifications. However, there are a growing number of books and courses to provide practical programming and organising ideas.

Becoming qualified

For leaders with a personal background in one or more outdoor activity and who wish to include this in their work it is increasingly important to demonstrate their competence with the appropriate leadership or coaching award. These not only give leaders confidence in their ability but it also serves to reassure employers and parents. The time and money involved is well worth the investment. Since the introduction of the Mountain Leadership Award the number of accidents that have occurred has remained constant despite a manifold increase in levels of participation.

These awards complement the leader's existing professional skills. It is important to bear in mind that the aim of the competences recognised by a coaching award are to develop a technical skill. The outdoor educator places an overlay on this process by using the skills to undertake a project or journey in order to develop personal, social and environmental awareness. For those leaders who become more involved in Outdoor Education, books, short professional development courses and post graduate courses are available to help them develop this approach.

A Career in the Outdoors

Outdoor careers can encompass such jobs as instructor, teacher, countryside ranger, youth leader, sports coach, development trainer or facility manager. You could be working in central Glasgow or the Outer Hebrides; with senior managers or disadvantaged youth; on your own or as part of a large team. The training available is equally diverse, partly because of the range of career paths available, and partly because of the range of skills you need to be competent at the job. This is a brief guide to the options open to you, whether you are a school leaver or an experienced practitioner.

Within the field there are opportunities for 'apprenticeship' roles suited to inexperienced enthusiasts and long term career options for those wishing to make it their profession. Some people spend a few years giving service to a job they enjoy before moving into another field. Others come to the field bringing with them a wealth of experience from another career. The choices are yours.

Generic Competences

Despite the wide range of options for work in this field there are competences that are common to everyone. These an be divided into three types:

- Technical skills such as safety management, administrations skills and environmental skills
- Process skills such as instructing and group leadership
- Meta skills such as sound judgement, creative thinking, ethical behaviour and clear vision

The technical skills are the easiest to train in and the quickest to acquire whilst the meta skills grow over a lifetime. With this in mind many employers recruit for the meta and process skills knowing that the appropriate technical skills can be easily developed once you start work. They are therefore especially important to describe in your curriculum vitae.

Career Options

If you are seriously interested in a career in the outdoors there are several branches of the profession from which to choose and many routes you can take to get there. The three main areas are:

Outdoor Recreation: leading people on outdoor activity sessions and trips or instructing people in the skills of their chosen outdoor pursuit. Roles include leading, coaching, technician and recreation manager.

Outdoor Education: using outdoor experiences, including both environmental and adventure activities, to provide learning opportunities for people in, through and about the outdoors. Roles include teacher, tutor and youth worker.

Outdoor Training: using outdoor experiences, probably combined with other training methods, to help people realise their potential as individuals, in teams or for organisations. Roles include development trainer and therapist.

Another option is to specialise in the provision of facilities such as kit stores, climbing walls, day and residential centres and country parks. This field of Facility Management often retains a strong people focus as public relations is very important. Roles include centre manager, technician, and countryside ranger.

Training for a Career

You can train for a career in the outdoors full time, part time or on the job.

On the Job Training It clearly helps to have qualifications when you are applying for a post but it is not essential if you are prepared to volunteer or accept low salaries in exchange for training. A good employer will provide a full induction training programme and may offer you opportunities to train for and be assessed in certain qualifications even for a seasonal appointment. An active interest in outdoor activities will help your application as will involvement in youth work as a group member or a young leader.

Some employers offer Volunteer or Training Placements for which you or a training agency pay. In this case you should have a number of opportunities to gain awards whilst on the job. The awards most likely to be offered are outdoor coaching awards from the various governing bodies of sport covering activities such as orienteering, sailing, canoeing, caving, mountain walking, single pitch climbing, etc.

Most of these awards are soon to change so that they become recognised as Scottish National Vocational Qualifications (SVQs) for coaches. An important award to obtain is a first aid certificate as this is needed in all outdoor work. It may also be possible to obtain SVQs in facility operations through opportunities such as these.

There are a few Youth Training and Modern Apprenticeship schemes available for people interested in this field of work but are unable to find employment. To see if there is one near you ask at your job centre. In the north of England the modern apprenticeship scheme is run by Adventure Education.

When selecting an organisation ensure that they work in the sector in which you would like to operate ie outdoor activity holidays (recreation) or outdoor education.

Further Education It has been possible for a number of years to take an award in Leisure Studies which specialises in outdoor recreation. It is now possible to follow a similar course with an outdoor education option. These courses will often give you the chance to gain governing body awards as well. They will also include extended placements to help you practice your skills.

Higher Education Degrees are available in Recreation Management (with an outdoor focus), Outdoor Education for teachers (BEd), Outdoor Education for youth workers (this offers a diploma that can lead to a degree) and general degrees in Outdoor and Environmental Studies which do not tie you to a particular profession. These courses often prefer mature students as some work and life experience is a major asset.

However, unless you are sure of the profession you wish to follow, a wider range of degrees can form an excellent foundation for a career in OE. Consider any Environmental Science, Psychology or a teaching degree in another specialism eg PE or Science or the Humanities. Several professions other than teaching and youth work can make use of the outdoors. There is a growing interest amongst the Probation and Prison Services, Social Work and Mental Health Workers. Consider a professional training in one of these fields before specialising in OE with a post graduate course.

Beware of degrees that mention an outdoor pursuits module as part of the course but not as a specialist subject. They are excellent as a taster and for personal development but do not give you a professional qualification in OE.

Post graduate qualifications These are available in Outdoor Education and Recreation Management. Courses are suitable for further professional development within the field or for people taking a sideways step into a new area.

Overseas A number of people have been attracted by the opportunity to take a masters degree in Outdoor Education in the USA. This is certainly worth a look if you wish to broaden your experience with the perspective of a different country. Americans are very articulate about the learning process and have developed expertise in different fields to the UK eg wilderness travel and therapeutic outdoor work. Contact the Association for Experiential Education for help. 'Outdoor Education' tends to mean 'Environmental Education' in North America. Look for Adventure or Experiential Education courses if this does not suit you. A number of higher degree courses in OE exist in Australia as well. You will need to consider funding and visa arrangements carefully.

Vocational Training New awards are appearing called Scottish Vocational Qualifications. They can be gained on the job and can be very flexible in approach. They are based on work based assessment rather than exams or tests. Awards exist for Outdoor Education, Facility Management and Training and Development. The latter two are progressive, leading to a high level of professional standing. The awards are especially useful for people who have gained experience through work but never gone to college. They can also form a natural and easy pathway from one professional field to another eg from teaching into training. An advantage of SVQs is that they are accepted as professional qualifications throughout the European Community.

Short Courses Many training organisations offer short courses in a wide range of topics related to our field. Those that offer courses specifically about the outdoors are listed below. Other topics that can extend your skills in useful ways include Counselling, Management, Care Work and the Creative Arts. Outdoor education is, above all, an approach to learning and so many skills can extend your scope into new markets or activities. The limit is your imagination. It is not a structured career but it can be a very rewarding and constantly changing one.

Secondary, further and higher education courses

GCSE Courses

The only examining board which currently offers a sailing-specific GCSE is the Northern Examinations and Assessment Board with its Nautical Studies course. See **Case studies**. Several examining boards offer sailing-related options such as outdoor and adventurous activities which can be studied within their Physical Education syllabuses. Design and Technology syllabuses have no explicit references to sailing but offer pupils the opportunity to demonstrate design and construction skills through a sailing-related project. Pupils are required to establish a practical need, then design and build a full size article or a model. Examples might include a lift to hoist a physically disabled person into a boat, or a launching trolley for an extreme boat design.

Northern Examinations and Assessment Board	NEAB, 12 Harter Street, Manchester, M1 6HL tel: 0161 953 1170	GCSE Physical Education GCSE Nautical Studies
University of London Examinations & Assessment Council	ULEAC Publications, River Park, Billet Lane, Berkhampstead, Herts., HP4 1EL tel: 01442 876701	GCSE Physical Education (1998 onwards)
Midland Examining Group	MEG, University of Cambridge, Local Examinations Syndicate, 1 Hills Road, Cambridge, CB1 2EU tel: 01223 553311	GCSE Physical Education

National Vocational Qualifications

There are at present two main routes for students to achieve a Scottish and National Vocational Qualification in the coaching of sailing:

1. S/NVQ Level 2 Coaching Award + RYA Dinghy Instructor Award

The **Award in Sport and Recreation, Coaching and Activity Delivery** is offered by many FE Colleges. It focuses on general coaching skills but may be approached specifically through dinghy sailing. The award for coaching adults consists of the following units:

D43 Prepare for coaching sessions
D44 Conduct coaching sessions
C35 Deal with accidents and emergencies
D13 Establish and maintain relationships which support the coaching process
B11 Support the development of the sport/activity

All units are assessed in the context of a sport/activity. They are described in detail in the **RYA Dinghy Coaching Handbook**. See **Resources** section. For full recognition as a coaching award specifically in dinghy sailing it must be accompanied by the successful completion of a five day **RYA Dinghy Instructor Award** course.

2. RYA S/NVQ Level 2 Coaching and Activity Delivery in Dinghy Sailing

The RYA has developed a portfolio which will enable schools and colleges to run their own S/NVQ coaching courses. The full pack of materials which can be purchased from RYA is referred to as *NVQ Candidate Portfolio (Dinghy Sailing)*. For further details contact the RYA Training Division at RYA House, Romsey Road, Eastleigh, Hampshire, SO50 9YA tel: 01703 627400.

BTEC Nautical Science and other sailing-related courses

South Tyneside College occupies three sites to the east of Newcastle, the Hebburn Centre, the South Shields Centre and the Seamanship & Survival Centre at the mouth of the Tyne.

The College offers a full range of courses in the three major disciplines of deck, marine engineering and marine communications and control. These include HND Marine Technology, BTEC/MSA Deck Cadet Courses and BTEC HND Nautical Science. In addition, training in personal survival and firefighting for both the merchant navy and offshore industry is provided in a purpose-built centre which has recently been extended and developed at a cost of over £4m. This is the only centre in the country to offer all sea survival and firefighting training on one compact site and, with our direct access to river frontage, it affords the ability to launch lifeboats and survival craft directly onto the river.

Courses span the whole spectrum of nautical education leading to Marine Safety Agency, Department of Transport certification from Class 5 to Class 1 and all associated short courses including GMDSS, Chemical Tanker Safety, Dangerous Cargo Petroleum and Liquefied Gas Endorsements and Bridge Team Training. This year the College has delivered the MNTB pilot courses for NV(1 Merchant Vessel Operations and NV(1 Merchant Vessel Engineering as well as a Seafish pilot course for Fishing Vessel Operations. Offshore courses to OPITO standards cover survival and firefighting. The College is always pleased to discuss companies' individual requirements and provide courses to meet their needs.

The facilities at South Tyneside College are among the best in the United Kingdom and it has a world-wide reputation for its contribution to marine education. In a recent Further Education Funding Council Inspection the top grade was awarded to the Nautical Science area of provision.

For further details contact: The Information Centre, South Tyneside College, St George's Avenue, South Shields, Tyne and Wear NE34 6ET tel: 0191 4273900.

GNVQ Marine Leisure Studies

Askham Bryan College is situated about four miles out of the lively City of York, with good transport links to the rest of the UK. The college offers a **GNVQ Leisure and Tourism** course with a **marine leisure option**, the only college in the UK offering this specialist qualification. It is designed for keen sailors who wish to obtain a nationally recognised qualification which will allow them to progress to higher education and collect a range of RYA qualifications at the same time.

The practical courses take place on the **Askham Bryan College Sailing School** yacht based at Scarborough Marina. Rodger Kennedy, the school Principal is a round Britain yachtsman and Yachtmaster instructor.

The **GNVQ Intermediate** is a one year full time course and the qualification is equivalent to four GCSEs. The progression is normally to GNVQ advanced. The entry qualification is four GCSEs (D, E or F).

The **GNVQ Advanced** course is two years full time. The qualification is equivalent to two A-levels and provides access to HND and degree courses in relevant subjects at universities. The entry qualification is four GCSEs (grade C and above).

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The course comprises eight Mandatory Units, options including a wide variety of leisure, tourism and sport units. Students who choose the **Marine Leisure option** gain the following qualifications in addition to their GNVQ:

- RYA competent crew
- RYA Dayskipper theory
- RYA Dayskipper practical
- RYA VHF
- RYA diesel engine
- RYA yachtmaster theory

The **RYA coastal skipper option** is subject to students logging sufficient hours and experience in their own time to qualify for the qualification. Other options include a dinghy unit, availability being subject to minimum numbers.

Career opportunities

The course prepares young people for higher education at degree or HND level and for employment in the marine industries. The range of career options includes :

- working in sailing fleets in a wide variety of practical work
- marina manager
- sales and marketing
- employment in many sectors of the tourism industry

For further details contact: Ian Snape or Martin Jackson at Askham Bryan College, Askham Bryan, York, YO2 3PR tel: 01904 772277.

GNVQ Leisure and Tourism courses

Many FE Colleges in the UK offer a GNVQ Leisure and Tourism course. In most cases the potential to include sailing within the leisure studies component will be strongly influenced by proximity to coastal or inland sailing centres. Details of local courses will be available in libraries and careers offices.

HND and BSc Hons Maritime Courses offered by the Southampton Institute

Southampton Institute is a major UK centre of higher education offering courses of a vocational nature leading to a range of HNC/Ds, certificates, diplomas, degrees and postgraduate qualifications. The City campus is located on the edge of the beautiful city parks and the Warsash campus, ten miles to the east of the city, occupies a picturesque location overlooking the River Hamble where it meets Southampton Water.

HND Leisure Studies (Water Based)

UCAS Course Code: 017N

This two year full-time course is designed for those students who will be seeking positions of responsibility within water based leisure. It provides a broad base of essential business knowledge and skills, an overview of the leisure industries and pathways options which enable students to gain teaching, coaching and organisational skills for water based leisure. NVQs and National Governing Body qualifications will also be available. The course will enable students to undertake many of the functions associated with the development, administration and promotion of water-borne leisure.

Career opportunities

On successful completion of the course, students will be equipped to make a valuable contribution to a team involved in the management, supervision and operation of water craft and their support services in both the public and private sectors. Typical areas of employment are marinas, sailing clubs and schools, boat charter companies and water authorities.

For further details contact: The Maritime Faculty, Southampton Institute, East Park Terrace, Southampton, SO14 0YN tel: 01703 319749.

BSc (Hons) Maritime Environmental Management

UCAS Course Code: F910

This three year full-time degree course offered by the Southampton Institute is designed to satisfy the growing demand for graduate entry into the environmental management profession. The programme is unique in that it specialises in water-based maritime and environmental issues. The course is subdivided into a number of pathways offering a considerable amount of choice in subject matter, enabling students to tailor the course according to their future ambitions.

The degree has an over-riding emphasis on sustainable development of the coast, inshore waters and the oceans. It also recognises that the training needs of the environmental management profession are diverse, with vocational opportunities in consultancy, business, industry, statutory bodies, the voluntary sector and local and central government.

Career opportunities

On completion of the course, graduates will have developed analytical skills and have a broad understanding of environmental resource management issues which will equip them for a maritime-related environmental career or the option to specialise in a particular aspect at postgraduate level.

Details can be obtained from the course leader: Dr Andrew Upton, Maritime Faculty, Southampton Institute, East Park Terrace, Southampton, SO14 0YN tel: 01703 319749.

BA (Hons) Maritime Leisure Management

UCAS Course Code: N780

This three year full-time degree course offered by the Southampton Institute is unique in that it specialises in water-based leisure and the environmental issues associated with it. The course is subdivided into a number of pathways which offer a choice of subject matter, enabling students to tailor their programme of studies to suit their individual career aspirations.

The degree has a strong vocational bias associated with leisure pursuits carried out in estuarial, inshore tidal waters and offshore environments. During their studies students are actively encouraged and enabled to attain vocational qualifications relevant to the leisure/marine industry.

Career opportunities

On completion of the course, graduates will have developed analytical skills and have gained a broad understanding of the principles of organisational management which will equip them for a career in the leisure industry.

Details can be obtained from the course leader: Ian Harris, Maritime Faculty, Southampton Institute, East Park Terrace, Southampton, SO14 0YN tel: 01703 319749.

BSc (Hons) Maritime Studies

UCAS Course Code: J600

This three year full-time degree course offered by the Southampton Institute is designed to enable students to acquire the knowledge and develop the skills that will allow them to enter the diverse maritime world as a shore-based graduate. The international nature of shipping is so wide as to embrace a range of career opportunities directly involved with the administration of sea transport and its users and suppliers. To satisfy these needs the course is divided into a number of pathways to enable students to tailor their studies according to their interests and aspirations.

Career opportunities

These include such diverse occupations as underwriting, legislation, surveying, port and quayside management, instrumentation, marine science, oceanographic studies and technology.

Details can be obtained from the course leader: Ian Harris, Maritime Faculty, Southampton Institute, East Park Terrace, Southampton, SO14 0YN
tel: 01703 319749.

Marine Studies Degree Courses offered by the University of Plymouth

Plymouth is the 'City of the Sea', located on the South Devon coast right on the border with Cornwall. It has an unrivalled situation with attractive and interesting coastlines to the east and west and Dartmoor National Park on its northern boundary. The University of Plymouth is one of the most popular universities in Britain, with plenty of exciting city life and a massive choice of student-orientated sports and social activities.

The Institute of Marine Studies has developed over many years into one of the largest and most widely based teaching and research establishments in the UK. It has achieved an international reputation for its teaching and research and maintains close links with the extensive maritime industry both home and abroad.

Undergraduate teaching is grouped into the following subject areas:

Maritime Business	Hydrography	Underwater Studies
Maritime Law	Marine Navigation	Fisheries Studies
Transport	Marine Technology	Nautical Studies
Maritime History	Marine Systems Technology	Marine Operations
Astronomy	Ocean Science	

The Institute's Marine Studies Modular Scheme provides the opportunity to study a combination of subjects with the sea as their theme, from a choice of over 200 modules. The current prospectus gives full details of these options.

For further information please contact the admissions tutor: John Kitching, Institute of Marine Studies, University of Plymouth, Drake Circus, Plymouth, PL4 8AA, tel: 01752 232407.

Case studies

The following brief accounts give a flavour of how sailing relates to normal curriculum work and extra-curricular activities in three secondary schools where sailing is a well-established part of the curriculum.

GCSE Nautical Studies

Based on information provided by Kim Siddall, Head of Nautical Studies at Graham School, Scarborough

Graham School, which opened in 1973 following the reorganisation of secondary education in Scarborough, derives its name from Mr C C Graham who was Mayor of Scarborough between 1913 and 1919 and who, in 1917, donated a building, East Mount, Paradise, to the town. This became the home of the Graham Sea Training School until its students joined the Sea Training Wing of the new Comprehensive School in 1973. Mr Graham's daughter, the late Miss Maisie Graham, showed an active interest in the new Comprehensive School. Thus, the school, in its name, represents strong links with the adventurous sea-going and shore-fishing elements in Scarborough, past and present.

Graham School is a co-educational comprehensive, currently catering for 1174 students aged 11 - 16 years. Sailing is one of the activities available to all students to pursue within Outdoor Education and during extra-curricular activities, and Years 8, 9 and 10 have a residential experience. All students have the opportunity to visit various Outdoor Education Centres such as Bewerley Park or East Barnaby at least once in their school career. The school has strong links with both the Ocean Youth Club and the Scarborough Yacht Club.

Each year the two year GCSE Nautical Studies (NEAB) course is offered in the spring term to all Year 9 students in the borough, and a mixed ability group of 24 boys and girls are selected on the basis of motivation. North Yorkshire County Council sponsors the residential element of training for all of these students. As part of the GCSE students participate in a week's dinghy course and complete RYA dinghy levels appropriate to their skills and experience. The students gain sea time experience by sailing with the Ocean Youth Club aboard their 70' ketch; during this time they complete most sections of the RYA Cruising Scheme Competent Crew Award.

Over the last twenty five years, the nautical studies courses have led Graham students into a wide variety of further and higher education courses and sailing-related careers. 6% of students have gone directly into fishing, representing the local families who fish out of Scarborough. 40% have joined marine-related industries such as the Royal Navy, Merchant Navy, leisure sailing, naval architecture and marine biology. 54% have gone on to do further and higher education courses.

GCSE Nautical Studies (NEAB)

This GCSE course is unique to Graham School. Its aims are to:

- develop recreational and vocational interest in nautical matters
- promote an understanding of the theoretical and practical aspects of seamanship and navigation
- serve as a foundation for more advanced studies

The syllabus includes meteorology, pilotage, theory of flotation, stability and lifting equipment, chart work, tidal predictions and sextant work. There is a strong emphasis on practical activities and practical tests, and the course includes a five day dinghy sailing course and a five day sea experience. For a copy of the full syllabus contact NEAB on 0161 953 1170.

GCSE PE, ASDAN Youth Award Scheme and sailing

Based on information provided by Jane Baxter, Nobel School, Stevenage

The Nobel School in Stevenage is a County Secondary School with 910 pupils on roll. During school time pupils are taken to Fairlands Valley Sailing Centre only two miles away where they are all brought up to the water-safe/basic skills stage. The school uses Hertfordshire School Sailing and Canoeing Association scheme and pupils work through the RYA Junior Logbook. Costs are very reasonable at only 70p per session because Nobel School uses its own instructors at the Fairlands Valley sessions. The more enthusiastic pupils have the opportunity to attend after-school sessions at the Centre and a Saturday Morning Club costs them only £2 for a two hour session.

Currently 42 pupils in Year 10 and 46 in Year 11 are studying for GCSE PE. The sailing aspects of **outdoor and adventurous activities** are dealt with mainly during a residential week at Barton Turf Sailing Camp. The intensive work at Barton is the only way in practice for pupils to achieve GCSE standard. Theory work is covered during the evenings, making use of quiz sheets on parts of the boat, points of sailing (diagrams), safety, health, clothing etc. The residential week at Barton costs each pupil a total of £110 including transport and excursions.

Few primary feeder schools introduce pupils to sailing and pupils usually gain their first experiences through the activities at Nobel School. When pupils leave the school, only the real enthusiasts continue to develop their skills, as many rely heavily on parents for financial support and transport to the Sailing Centre. Some ex-pupils return from FE College and University to help with school activities but many cannot continue with regular involvement and impetus is rapidly lost. There is scope for promoting continuity for leavers if sailing clubs could be encouraged to become more proactive by setting up squads and encouraging racing locally.

It is sad but true that enthusiasm for sailing in all schools is very much dependent on the personalities and interests of staff in schools and when staff leave, the activities often cease and another school benefits.

ASDAN Youth Award Scheme

All Nobel pupils from Year 9 onwards are timetabled for one hour in alternate weeks to take part in the ASDAN Youth Award Scheme. The school has an overall staff co-ordinator who also moderates, plus individual year group co-ordinators.

The scheme consists of core skills which apply across all levels and modules which present a choice of challenges at each level. Core skills such as **Communication**, **Working with Others**, **Improving Own Learning and Performance**, **Problem Solving** and modules such as **Sport and Leisure** and **Health & Survival** all lend themselves readily to the sailing context. Pupils use a record folder to gather evidence of skills and achievements from a wide variety of sources. This can include such items as sailing session attendance tickets, photographs of the pupil engaged in various sailing activities and sailing logs or diaries from the residential week at sailing camp.

The unique ways in which this popular scheme complements both curricular and extra-curricular activities means that it is not viewed as an extra burden by staff or pupils.

See also the **ASDAN Youth Award Scheme** in the **Why Sail?** section.

Note: Since this article was written Jane Baxter has left Nobel School. As a result the school is currently no longer able to offer sailing as part of the general curriculum, although pupils will still go to Barton Turf Sailing Camp.

GCSE Design & Technology and sailing

Based on information provided by Alistair Buckoke, Head of D&T at Magdalen College School, Oxford

Magdalen College School in Oxford is an independent boy's school with a selective intake and a strong emphasis on academic achievement. There are two sections, the junior catering for 9 to 11 year olds and the senior for 11 to 18 year olds. The school has an enthusiastic sailing club membership also divided into junior and senior sections and from this is drawn a sailing team. The club operates from Farmoor Reservoir, with six Laser 2 boats of its own and the use of three Bosuns belonging the RN Combined Cadet Force, also based at the reservoir.

Design and Technology is a strong department which devises its own programmes of study and learning materials and opts to base these on the requirements of the National Curriculum. For Key Stage 2 pupils the programme includes a one term project on 'rubber-band boats'. This involves a demanding challenge to design and build a boat capable of crossing a wide river by rubber power alone. It introduces such concepts as slow release of energy, streamlining to reduce water resistance, directional stability, the importance of hull length for speed in non-planing contexts, use of ballast, wind resistance above water-line and friction reduction in the drive mechanism. The project works well and would apply equally well at Key Stage 3.

Key Stage 3 and 4 pupils follow the MEG and SEG GCSE Design and Technology courses. The following chart gives a small selection of examples of how sailing can provide a meaningful context for GCSE work at Key Stage 4.

Sailing-related themes can be an excellent choice for GCSE practical projects. The three examples below had in common the focus of creating or exploiting a market opportunity. The briefs chosen by pupils were:

- to design and make a radio-controlled model catamaran which could be easily dismantled and packed to allow transport by bicycle
- to design and make a radio-controlled model yacht using a small vacuum-forming machine to construct the hull
- and to design and make a radio-controlled model yacht where all the working parts were integrated into a water-tight podule for slotting into a polystyrene hull block which could allow younger enthusiasts of modest means to shape and experiment with their own hulls

The design and construction of radio-controlled model boats requires a high level of practical and design skills and is very demanding of time. The possibility of direct experience is a big plus for pupils but the expense of materials and components can be daunting, especially if used on any scale. More success could perhaps be found with smaller scale, non-radio controlled model sailing 'products', with greater emphasis on ease of construction and use of cheaper materials and components. This area has great potential for courses in Years 8 to 10 and lends itself to studies such as the balance between hull and sail configuration, rudder and keel design, aerodynamic lift and drag, the effects of length and beam and mono-hulls versus multi-hulls.

Key Stage 4 Programme of Study

1. Pupils should be given opportunities to develop their design and technology capability through:

a. assignments in which they design and make products. Taken together these assignments should require activity related to industrial practices and the application of systems and control

b. focused practical tasks in which they develop and practise particular skills and knowledge

c. activities in which they investigate, disassemble and evaluate familiar products and applications

2. Pupils should be given opportunities to:

a. apply skills, knowledge and understanding from the programmes of study of other subjects, where appropriate, including art, mathematics and science

3. Designing skills Pupils should be taught:

e. to consider an increasing range of users

h. how graphic techniques, IT equipment and software can be used in a variety of ways to model aspects of design proposals and assist in making decisions

4. Making skills Pupils should be taught:

f. how computer-aided manufacture (CAM) is used both in manufacturing in quantity and in the production of single items and small batches

l. to ensure, through testing, modification and evaluation, that the quality of their products is suitable for intended users

Knowledge and understanding

5. Materials and components Pupils should be taught:

b. how materials can be combined and processed in order to create more useful properties and how these properties are utilised in industrial contexts

e. that to achieve the optimum use of materials and components, account needs to be taken of the complex interrelationships between material, form and intended manufacturing processes

7. Products and applications

a. Pupils should be taught to relate the workings and functions of a wide range of products and applications to:

d. the processes used to produce them

Examples of sailing-related activities

Model boats. Radio control. Boat fittings (eg running rigging, rudders, cleats, clips etc). Instrumentation (temperature, speed, wind direction, navigation). Clothing. Buoyancy aids. Stowage and storage. Protest flags

Laying up glass reinforced plastic
Laminating timber

Radio control systems. Commercial model boats
Full size boat features and fittings

Moments. Couples. Triangle of forces. Centre of gravity. Buoyancy and displacement. Fluid dynamics. Tension and compression

Windsurfers, dinghy sailors, keelboat racing, yacht racing and cruising

Use of curves in CAD packages to work up hull profiles
Making templates eg for sail cutting

Vacuum forming mould construction for hulls
Using CNC lathe to make block wheels
Cutting fabrics for clothing or sails

Waterproofing

Glass-fibre
Carbon-fibre or Kevlar reinforcement of plastic resins
Laminate and sandwich construction

Mould release problems

Access to local commercial processes for practical work